

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
MINISTRY FOR EDUCATION AND SCIENCE OF UKRAINE
ЗАПОРІЗЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ
ZAPORIZHZHYA NATIONAL UNIVERSITY

ФАКУЛЬТЕТ МЕНЕДЖМЕНТУ
FACULTY OF MANAGEMENT

КАФЕДРА ПІДПРИЄМНИЦТВА, МЕНЕДЖМЕНТУ ОРГАНІЗАЦІЙ ТА
ЛОГІСТИКИ
CHAIR OF ENTREPRENEURSHIP, MANAGEMENT OF ORGANIZATIONS
AND LOGISTICS

КВАЛІФІКАЦІЙНА РОБОТА
МАГІСТРА

на тему Гнучкість в управлінні проектами в ІТ компанії «GroupBWT»

THESIS FOR THE MASTER'S DEGREE

Flexibility in project management at the it company «GroupBWT»

Виконав: студент 2 курсу магістратури,
спеціальності 073 Менеджмент освітньої програми
Менеджмент організацій і адміністрування
Н.С. Жабицька

Керівник зав. каф. ПМОіЛ, проф., д.е.н. Л.М.Бухаріна
Рецензент доц. каф. ПМОіЛ, к.е.н. Т.С. Павлюк

Запоріжжя
2020

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ЗАПОРІЗЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ

Факультет менеджменту

Кафедра підприємництва, менеджменту організацій та логістики

Рівень вищої освіти магістр

Спеціальність 073 Менеджмент, освітня програма Менеджмент організації та адміністрування

ЗАТВЕРДЖУЮ

Завідувач кафедри

д.е.н., проф. Бухаріна Л.М.

«___» _____ 20__ року

**ЗАВДАННЯ
НА КВАЛІФІКАЦІЙНУ РОБОТУ СТУДЕНТУ**

Жабицькій Надії Сергіївні

1. Тема роботи Гнучкість в управлінні проектами в ІТ компанії ТОВ «GroupBWT»

керівник роботи Бухаріна Л.М., професор, завідувач кафедри підприємництва, менеджменту організацій та логістики, д.е.н.

затверджені наказом ЗНУ від «___» _____ 20__ року №___

2. Строк подання студентом роботи «___» _____ 20__ р.

3. Вихідні дані до роботи джерела Інтернет, спеціалізована література, періодичні видання, матеріали науково-практичних конференцій з досліджуваних питань.

4. Перелік питань, які потрібно розробити:

Кваліфікаційна робота магістра складається з основної частини і додаткової. Основна частина містить такі структурні елементи: вступ, сутність (3 розділи – теоретичний, аналітико-дослідницький, проектно-рекомендаційний), висновки та рекомендації, список використаних джерел.

1 Розділ – Концепції управління проектами в ІТ галузі – складається з 2 підрозділів: 1.1 Огляд формування проектного менеджменту як самодостатньої дисципліни та ІТ-індустрії в Україні; 1.2 Теоретичні основи та концепції управління проектами;

2 Розділ – Аналіз діяльності досліджуваної компанії ТОВ «GroupBWT» – складається з 3 підрозділів: 2.1 Загальна характеристика підприємства ТОВ «GroupBWT»; 2.2 Аналіз організаційної структури управління підприємства «GroupBWT»; 2.3 Аналіз управління проектами у ТОВ «GroupBWT»;

3 Розділ Результат проведеного дослідження: рекомендації та пропозиції щодо вдосконалення організаційної структури управління та управління проектами.

зокрема для ТОВ «GroupBWT» – складається з 2 підрозділів: 3.1 Удосконалення, які повинні бути введи до організаційної структури ТОВ «GroupBWT»; 3.2 Вдосконалення практик управління проектами в рамках компанії.

5. Консультанти розділів роботи

Розділ	Прізвище, ініціали та посада консультанта	Підпис, дата	
		завдання видав	завдання прийняв
1	Бухаріна Л.М., професор, завідувач кафедри підприємництва, менеджменту організацій та логістики, д.е.н.	14.09.2020 р.	14.09.2020 р.
2	Бухаріна Л.М., професор, завідувач кафедри підприємництва, менеджменту організацій та логістики, д.е.н.	16.10.2020 р.	16.10.2020 р.
3	Бухаріна Л.М., професор, завідувач кафедри підприємництва, менеджменту організацій та логістики, д.е.н.	16.11.2020 р.	16.11.2020 р.

6. Дата видачі завдання 10.10.2020 р.

КАЛЕНДАРНИЙ ПЛАН

№ з/п	Назва етапів кваліфікаційної роботи	Строк виконання етапів роботи	Примітка
1	Узгодження теми, складання змісту	жовтень	виконано
2	Вивчення літературних джерел	жовтень	виконано
3	Збирання матеріалу на підприємстві	жовтень	виконано
4	Обробка матеріалу	жовтень	виконано
5	Виконання розділу 1	жовтень	виконано
6	Виконання розділу 2	листопад	виконано
7	Виконання розділу 3	грудень	виконано
8	Формулювання висновків	грудень	виконано
9	Оформлення роботи, одержання відгуку та рецензії	грудень	виконано
10	Подання роботи на кафедру	грудень	виконано

Студент _____ Н.С. Жабицька
(підпис)

Керівник роботи _____ Л.М. Бухаріна
(підпис)

Нормоконтроль пройдено

Нормоконтролер _____
(підпис) (ініціали та прізвище)

РЕФЕРАТ

Кваліфікаційна робота: 97 с., 8 рис., 22 табл., 40 джерел.

Об'єктом дослідження є ТОВ «GroupBWT».

Метою роботи є визначення основних напрямків удосконалення організаційної структури управління та її системи управління проектами досліджуваного підприємства.

Методи дослідження – описовий, порівняльний, аналітичний, табличний, графічний, метод усного опитування, групування та узагальнення даних, експертних оцінок.

Актуальність теми даної кваліфікаційної роботи визначається тим, що для досягнення малим підприємством, основна діяльність якого пов'язана з ІТ галуззю, успіху на шляху розвитку необхідно створити та налагодити систему управління проектами, що є основним видом продукції, яка допоможе випускати якісну продукцію без зростання собівартості а також необхідністю удосконалювати організаційну структуру управління підприємством.

Під час виконання роботи було розглянуто теоретичні основи управління проектами на підприємствах зайнятих у ІТ галузі.

На основі теоретичного матеріалу було проаналізовано діяльність «GroupBWT» та запропоновано заходи щодо удосконалення системи управління проектами та організаційної структури управління на досліджуваному підприємстві.

Отримані в кваліфікаційній роботі результати можуть бути використані керівництвом ТОВ «GroupBWT» в практичній діяльності і сприятимуть удосконаленню діяльності малих підприємств України зайнятих у ІТ галузі.

ОРГАНІЗАЦІЙНА СТРУКТУРА, УПРАВЛІННЯ ПРОЕКТАМИ, РОЗВИТОК, ЕФЕКТИВНІСТЬ, ІТ ГАЛУЗЬ, ІТ ПРОЕКТ, МЕНЕДЖМЕНТ

ABSTRACT

Thesis for the Master's Degree: 97 pp., 8 img., 22 tab., 40 sources.

The object of the research is LTD «GroupBWT».

The purpose of the work is to determine the main directions of improvement of organizational management structure and project management system of the investigated company.

The research methods: descriptive, comparative, analytical, tabular, graphical, a method of method of verbal survey, grouping and summarizing data, expert assessments.

Background of this thesis is determined by the fact that for the small business, the main activity of which is related to the IT industry, to succeed in its growth it is necessary to create and establish an effective project management system (as a project is its main product) that will help to produce quality products without increasing production costs, and also by the need to improve the organizational structure of the company management.

During the execution of the thesis we were considered Theoretical basics of project management at enterprises operating in the IT industry. Based on the theoretical material was analyzed the activities of the LTD «GroupBWT» and suggested ways of improving of the project management system and organizational management structure at the investigated company.

The specifics character of the paper consists in the fact that the results may be used in the practice of the LTD «GroupBWT» and will contribute to the improvement of small businesses in Ukraine working in IT industry.

ORGANIZATIONAL STRUCTURE, PROJECT MANAGEMENT,
DEVELOPMENT, EFFICIENCY, IT PROJECT, IT INDUSTRY,
MANAGEMENT

СПИСОК УМОВНИХ ПОЗНАЧЕНЬ, СКОРОЧЕНЬ ТА СИМВОЛІВ

LLC – Limited liability company;

IT – Information technology;

PMBOK – Project Management Body of Knowledge;

EVM – Earned Value Management;

CCPM – Critical Chain Project Management;

PMI – Project Management Institute;

SME – Small and medium-sized enterprises;

R&D – Research and development;

BizDev – Business Development;

Dev – Development;

UI – User interface;

UX – User experience;

QA – Quality assurance;

PM – Project manager;

FP – Fix price;

TM - Time & Materials;

OPEX - Operating expense.

ЗМІСТ

INTRODUCTION.....	8
CHAPTER 1 THE CONCEPTS OF THE PROJECT MANAGEMENT IN THE IT INDUSTRY.....	10
1.1 The overview of the Project management appearance as a self-sufficient discipline and the IT industry in Ukraine.....	10
1.2 The theoretical basics of the Project Management.....	18
CHAPTER 2 ANALYSIS OF THE ACTIVITIES OF THE STUDIED COMPANY «GROUPBWT».....	47
2.1 General characteristics of the «GroupBWT».....	47
2.2 Analysis of the GroupBWT’s organizational management structure.....	53
2.3 The analysis of project management at the studied company GroupBWT.....	63
CHAPTER 3: THE OUTPUT OF THE PERFORMED RESEARCH: RECOMMENDATIONS AND PROPOSITIONS TO THE MANAGEMENT STRUCTURE IMPROVEMENT AND PROJECT MANAGEMENT IN PARTICULAR FOR THE GROUPBWT.....	69
3.1 Improvements that should be applied to the organizational structure of GroupBWT.....	69
3.2 Improving the practices of Project Management performance within the company.....	75
CONCLUSION.....	91
REFERENCES	93

INTRODUCTION

The relevance of the investigated topic is confirmed by the current circumstances of the Ukrainian small IT businesses, the statistics of their project management efficiency, and their problems and issues that are faced by small IT companies on their way to growth. The investigated topic has been studied by the following well known figures in the IT project management: Vladlen Berezin, Timur Yagofarov, Evgeny Kulikov, Oleksandr Shelest, Yaroslav Kutovy, Ihor Samokhodsky, Bill Brown, and the others. The main concern that these authors hold is the tempts of the Ukraine's IT market growth, which faster than many countries in Eastern Europe, and the rawness of the business basics which does not provide the required environment for the development of the small businesses to the middle size or higher.

The estimated number of IT companies in Ukraine varies considerably depending on the datasource. According to official data, there were 12,634 companies as of the end of the first half of 2018. It should be noted that the liquidated companies were also included in this list, so the number of really operating companies can be much smaller. At the same time, one company may have several legal entities, which also affects official statistics, since it shows the number of legal entities.

The most important factor that does not allows the small companies to perform the growth strategy without losing the efficiency of the business is its organizational management structure. The organizational structure in the IT companies provides the business with the key attributes – the flexibility and the transparency of the processes. Most of the IT companies who has the number of employees in under 80 persons have either a line-functional, or, more often, a weak matrix organizational structure of the management since these are the easiest structures to be applied on the first steps of business. The issues are faced on the phase when the above-mentioned organizational structures become no longer relevant for the business and on concur complicate the process of business management. And in

order to survive the business has to move to the other models of organizational structures. For the small businesses in most cases having a high percentage of flexibility is important, providing that the main product of any IT company is project, create and implement the new organizational structure is quite difficult process.

The next issue comes from the same need – the management structure. As the project is the main product of the IT companies providing the required level of project management quality is as important as applying the workable organizational structure. These two attributes are tightly bounded and have a certain level of dependency between each other.

In this work we pursued these assignments: investigate the concept of project management in IT halls; Review of the formulation of project management as a self-sufficient discipline and IT-industry in Ukraine; Researched the theoretical foundations of the concept of project management; Analyze the performance of the investigated company LLC «GroupBWT»; Examine the general characteristics of the LLC «GroupBWT» company; Analyze the organizational structure of the management of the «GroupBWT»; Analyze the project management of the LLC «GroupBWT»; Provide the output of the performed research: recommendations and propositions to the management structure improvement and project management in particular for the LLC «GroupBWT»; Present the improvements that should be applied to the organizational structure of GroupBWT; Providing the strategy of improving the practices of Project Management performance within the company.

The object of our examination is the small IT company, which is based in Ukraine, Zaporizhzhia, the LLC «GroupBWT». The organizational structure of the company and the project management performance within it.

The methodologies that were used in this study are the following: descriptive, comparative, analytical, tabular, graphical, a method of method of verbal survey, grouping and summarizing data, expert assessments.

CHAPTER 1

THE CONCEPTS OF THE PROJECT MANAGEMENT IN THE IT INDUSTRY

1.1 The overview of the Project management appearance as a self-sufficient discipline and the IT industry in Ukraine

Before the profession of project management was defined there were projects, but they didn't share many of the foundations that hold up project management today. Pharaohs built the pyramids of Egypt around 2500 BC, and to this day we are not sure how they accomplished such a vast project. The records show that even then there were managers who were responsible for each of the faces of the Great Pyramid project. More recently, the need for a more pronounced structure in construction, manufacturing and transportation in the 19th century lead to the birth of project management as we recognize it today. While there might not have been task management, scope or workload considerations at the time, there was certainly leadership at play, and there must have been some budgeting, maybe even opening, ending, and scheduling of some sort. But with practice came process and refinement. We will briefly list for you the historical fact of the 19th century – the time when the sphere of project management originates [36]. General overview of the modern development of the field of project management will be presented in the Table 1.1 below.

Table 1.1

Historical facts of project management

Year	Fact	Description
1911	The publication of Frederic Taylor's «The Principle of Scientific Management»	was based on his work in the steel industry, as an attempt to help unskilled workers transition to new, more complexed projects by simple learning techniques. He pioneered the need for incentive-based wage systems, and how to take advantage of time-saving techniques.
1917	Henry Gantt creates the Gantt Chart	Henry Gantt is often considered the father of modern project management. In 1917, he created the eponymous scheduling diagram. This was an innovation. He used a

		visual timeline to build tasks as points with duration and linked them if they were dependent. In this way, everyone could see the graph more clearly. The Gantt chart was the novelty around the project management world. It was used in the building of the Hoover Dam in 1931, which was one of its first major implementations. Gantt charts continue to be used today and have already been transitioned to the digital world with variety online versions that make them easier to use.
1956	The American association of Cost Engineers (now AACE International) was founded	was formed by a group of project managers and associated specialists of planning, scheduling, cost estimating and other related fields. It continues today as one of the leading professional societies of project managers and related fields. In 2006, they released the first integrated process for portfolio, program and project management with their Total Cost Management Framework.
1957	The Critical Path technique was developed by Dupont	a technique that is used to predict how long a project will take. It analyzes which sequence of activities has the least amount of scheduling flexibility. The technique was developed to help work through the complexities of shuttering chemical plants for routine maintenance.
1958	United States department of Defense's US Navy Special Projects Office developed the Program Evaluation Review (PERT) for its Polaris project	It was developed as a method to analyze the tasks involved in completing a Polaris mobile submarine-launched ballistic missile project. It focused on the time needed to complete each task and identified the minimum amount of time required to finish the whole project
1962	The Department of defense mandated the use of Work Breakdown Structure (WBS) for future projects	is a complete hierarchical tree structure of the deliverables and tasks needed to complete a project. It was also part of the Polaris project.
1965	The International Project Management Association (IPMA) was founded	is the world's first project management association. Founded in Vienna as a means for project managers to network, the organization is now registered in Switzerland and is compiled of 50 national and internationally oriented project management associations. As of 2012 it had over 120,000 members.
1969	The nonprofit Project Management Institute (PMI) was founded	Incorporated in Pennsylvania, it held its first symposium in Atlanta. It has since published A Guide to the Project Management Body of Knowledge (PMBOK), which outlines the processes and knowledge areas of project management and became standard in 1998. PMI is also a certification body, offering both the Certified Associate in Project Management (CAPM) and the Project Management Professional (PMP).
1984	The management philosophy Theory of Constraints (TOC) was developed by Dr. Eliyahu M. Goldratt	The management philosophy of the Theory of Constraints (TOC) was developed to help an organization meet its goals. The title comes from the idea that a manageable system is limited in achieving its goals by several constraints. It was first introduced by Dr. Eliyahu M.

		Goldratt in his 1984 novel <i>The Goal</i> . The theory was applied to the creation of the Critical Chain Project Management.
1986	The beginning of Scrum methodology	The Agile software development model that incorporates multiple small teams working intensely and interdependently is known as Scrum, which was named as a project management style in 1986. The term comes from a paper first published in the <i>Harvard Business Review</i> called «The New Product Development Game» by Takeuchi and Nonaka. Developed for software management, it has since moved into use with general projects.
1989	the UK government created Projects in Controlled Environments (PRINCE); Earned Value Management (EVM)	The idea of an earned value concept isn't new. It's been around since the turn of the 1900s, but it came to prominence as technique in project management by 1989. Earned Value Management (EVM) helps measure project performance by using a systematic project management process to find variances in projects based on the comparison of work performed and work planned. It is a powerful predictor of cost and schedule control. PRINCE - The UK government created Projects In Controlled Environments (PRINCE) as its standard for all information systems projects in 1989. It was revised in 1996 as PRINCE2 due to criticism that it was too unwieldy and rigid, and therefore only suited for large projects.
1997	Eliyahu M. Goldratt developed Critical Chain Project Management (CCPM) based on the methods and algorithms of his Theory of Constraints	Eliyahu M. Goldratt developed Critical Chain Project Management (CCPM), which is based on the methods and algorithms of his Theory of Constraints. It keeps resources levelly loaded, while remaining flexible to their start times, and switching between tasks when necessary to keep the project on schedule.
2001	Agile as a project style was codified with the creation of Agile Manifesto or Software Development Manifesto	The use of iterative and incremental development methods traces back to 1957 with evolutionary project management, though adaptive software development didn't emerge until the 1970s. But the widespread use of Agile as a project style was codified with the creation of the Agile Manifesto or the Software Development Manifesto, in 2001.
2008	ProjectManagement.com is released bringing project management into the cloud	one of the first cloud-based project management software with real-time dashboards and online Gantt charts among other features.

The history of project management is still being written but as you might have noted from the short description of it the project management is a relatively young science. We suggest that the sphere of project management in Ukraine suffers most from the lack of core education in the industry which is why it was decided to create the work you are reading at the moment. In the following chapters we would share

with you the core knowledges and the basics of Project Managements as a phenomenon of the great science - Management.

IT Industry overview.

Moving forward we would like to present to you a brief overview of the IT industry in Ukraine (2018 – 2020). Here we will present the brief overview of the IT industry in Ukraine for the period of 2018- 2020. The IT (Information Technology) area is rather young industry for Ukraine. However, over 25 years of experience, companies working in this sector have accumulated plenty of experience and gained a good reputation in the international market. This economy sector continues to show high growth dynamics (about 20% annually), develop, and deepen cooperation with customers from all over the world. By 2020 information and communication technologies are the third largest industry, accounting for 20% of all Ukrainian service exports.

Ukraine has the largest and fastest-growing number of IT professionals in Europe. Ukraine employs about 180,000 people, according to the State of European Tech report 2018. We have studied the DOU.ua which is the largest Ukrainian developer community, and according to their report the great majority of Ukrainian IT specialists (67%) live in Kyiv, Kharkiv, and Lviv (with the least number but though great come Dnipro and Odessa).

The largest IT-companies of Ukraine have offices in the biggest technological hubs of the country to attract the best specialists. 43 out of 50 major IT-companies of Ukraine have their development hubs in the capital.

Below, in the Table 1.2, you will find the statistics of the biggest Ukrainian IT hubs.

Table 1.2

The statistics of the biggest Ukrainian IT hubs for the 2019

City	Market share	Number of software developers
Kyiv	40%	68 477
Lviv	15%	23 348
Kharkiv	14%	19 684
Dnipro	8%	11 822
Odessa	5%	9 453

Vinnitsia	3%	-
Zaporizhzhia	2%	-
Ternopil	2%	-
Ivano-Frankivsk	1%	-

Kyiv and Lviv are primary destinations for IT outsourcing to Ukraine. Over half of all Ukrainian developers are employed in these two giants. The most widespread programming language in Ukraine is Java. According to the statistics provided by LinkedIn, almost 5K of Java developers work in Lviv, with the total number of 27K.

Therefore, we will provide you with a more detailed information and statistics on the five largest largest technological hubs.

The IT Market in Kyiv. Kyiv is a major cultural, economic and scientific center of the country. It is hardly surprising that the largest number of IT-specialists (40%) works in the here. Kiev has a great number of outsourcing businesses and startups.

Here are a few reasons for this:

1. Kiev is the most densely populated and the largest city in Ukraine;
2. Most large companies (not only IT) have their own development hubs in Kiev;
3. It has the highest level of business activity in the whole country.

Moreover, 3 out of 12 Ukrainian universities with best technical programs (according to DOU), are located in Kyiv. Thus, the talent pool keeps expanding even further. The leading colleges are Taras Shevchenko National University of Kyiv, the National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute», and National University of «Kyiv-Mohyla Academy». Kyiv is one of the fastest-growing cities in the country. This is the reason why world enterprises, such as Samsung, Huawei, Ericsson, NetCracker, and many other global companies have R&D centers in the city. Furthermore, many companies are outsourcing software development to Kyiv. The biggest Ukrainian IT companies have large development

centers in the capital. Many successful tech startups also have offices in the capital, including Grammarly, Petcube, Terrasoft, Augmented Pixels, and others.

The IT market in Lviv. Lviv is the largest city in Western Ukraine with the population of over 800,000 people, and more than 20,000 of them work in the IT industry. According to State of European Tech, the majority of Lviv software developers work for either outsourcing (46%) or outstaffing (11%) companies.

The city has a beautiful architecture with a lot of historical buildings included in the UNESCO World Heritage List. Lviv City Council states that 2,2M tourists visited the city in 2018 and this figure grows every year. Tourism, mechanical engineering, and IT are the three most developed spheres in Lviv. The city takes third place in Ukraine by the number of programmers. Average Lviv developer is 28 years of age with over 3 years' experience.

Speaking of software development in Lviv, 317 IT companies are based in the city. Most of them provide software outsourcing services to clients in the USA, Western Europe, the UK, the Nordic countries, and other locations. In 2018, about 14,000 students studied at universities with tech programs, so the industry has a constant inflow of fresh talent. Ukrainian Catholic University and Ivan Franko National University of Lviv from the DOU ranking of best Ukrainian universities are situated in Lviv. Moreover, a lot of IT conferences take place in Lviv. For instance, IT Arena - the biggest IT event in Ukraine- gathers up to 4,000 IT specialists both from Ukraine and abroad.

The IT market in Kharkiv. Situated in the north-east of the country, Kharkiv is the second-largest city in Ukraine with almost 1.5M citizens. The city is one of the most industrialized in the whole country. Due to its long-established engineering tradition, well-developed machinery and electronics industries, it is a big business hub.

Also, 3 out of 12 Ukrainian universities with the best technical programs are located here. They are Simon Kuznets Kharkiv National University of Economics, Kharkiv National University of Radio Electronics, and Kharkiv Aviation Institute: National Aerospace University. All of them graduate highly skilled technical

professionals. Software outsourcing is a well-developed industry in Kharkiv. There are over 25,000 IT specialists in the city and around 450 active tech companies. The USA is the largest export market for Kharkiv IT companies, as it constitutes almost 65% of all IT export.

The IT market in Dnipro. Dnipro is another big IT hub in Ukraine. It is home to almost 12,000 IT specialists. Oles Honchar Dnipro National University and Dnipro Polytechnic National Technical University belong to Ukraine's top-ten universities. 60% of Dnipro citizens have a university degree. So the city has a highly educated workforce. Speaking of the IT service industry in Dnipro, there are more than 170 IT companies. 41% constitute middle engineers and 36% - senior developers, so the city has a lot of experienced IT talent [40].

The IT market in Odessa. Odessa is the fifth most populated city in Ukraine. It is a major tourist centre, a seaport, and a transportation hub located on the northwestern shore of the Black Sea. The software outsourcing sector plays an important role in the city's economy. According to DOU, the number of IT specialists has grown from 6,000 to 10,000 people in recent years. The city's strong educational system ensures a constant inflow of new talent into the sector. The majority of Odessa software developers work in 150 IT companies this city houses.

Ukraine is known worldwide as a major IT outsourcing destination for many reasons, such as experienced and well-educated talent, a favorable geographical position, and cost-effectiveness. The cities we've mentioned above are well-established tech hubs with a great number of software developers. These cities have both experienced professionals and a constant inflow of new skillful talents thanks to the strong educational system.

It worth to mention, even though the 2020 IT industry summary has not been presented yet – at the beginning of 2020, the number of specialists employed in the IT industry reached 200 thousand people. This is 19% more than a year earlier. More than 4,000 technology companies operate in Ukraine in total. Three Ukrainian startups have already achieved unbelievable success - they received an estimated \$1

billion. The latest of them was Grammarly, a company developing and delivering text grammar correction services.

More than a hundred companies from the Fortune 500 list resort to Ukrainian IT companies' services. The United States and Western European countries are the main target markets for Ukrainian technology companies. In January 2020, Google claimed to open its R&D development center in Ukraine. It will be the third one in Europe for the corporation. Besides, such renowned companies as Samsung, Amazon, Oracle, NEC, and Boeing have their R&D centers in our country as well. Considering the above mentioned, we may conclude that Ukraine's thriving IT industry is already an increasingly important driver of economic growth. With the right support, it can also have a transformative effect that will further strengthen Ukrainian democracy and consolidate the country's Euro-Atlantic trajectory. US private sector involvement in the Ukrainian IT sector can help this consolidation process while also offering extremely attractive economic returns.

Today's Ukraine faces a myriad of challenges hampering its progress. These include a systemic corruption, weak rule of law, and an economy dominated by oligarchs. While there are no easy solutions to these complex issues, one of the most immediately obvious low-hanging fruits is support for Ukraine's IT sector. Potential backing for the IT sector could involve bringing together entrepreneurs, successful startups, small and medium enterprises (SMEs), and trade groups from Ukraine, the US, and partner countries with the goal of creating new opportunities for investment, jobs, partnership, and collaboration. The US already has a significant interest in the Ukrainian IT industry. American customers are the largest consumers of Ukraine's IT services, accounting for 50 percent of clients nationally.

In total, Ukrainian IT firms do business with over one hundred Fortune 500 companies. Unlike other sectors of Ukraine's economy, oligarchic interests have not permeated the IT industry, with 80 percent of the sector consisting of SMEs. Additionally, COVID-19 has not significantly affected the industry due to its virtual ecosystem. With that being said, Ukraine has all preferences to become one of the world centers for the IT industry [33] [27].

1.2 The theoretical basics of the Project Management

There are quite a few of the project definitions shown on the Image 1.1 [25].

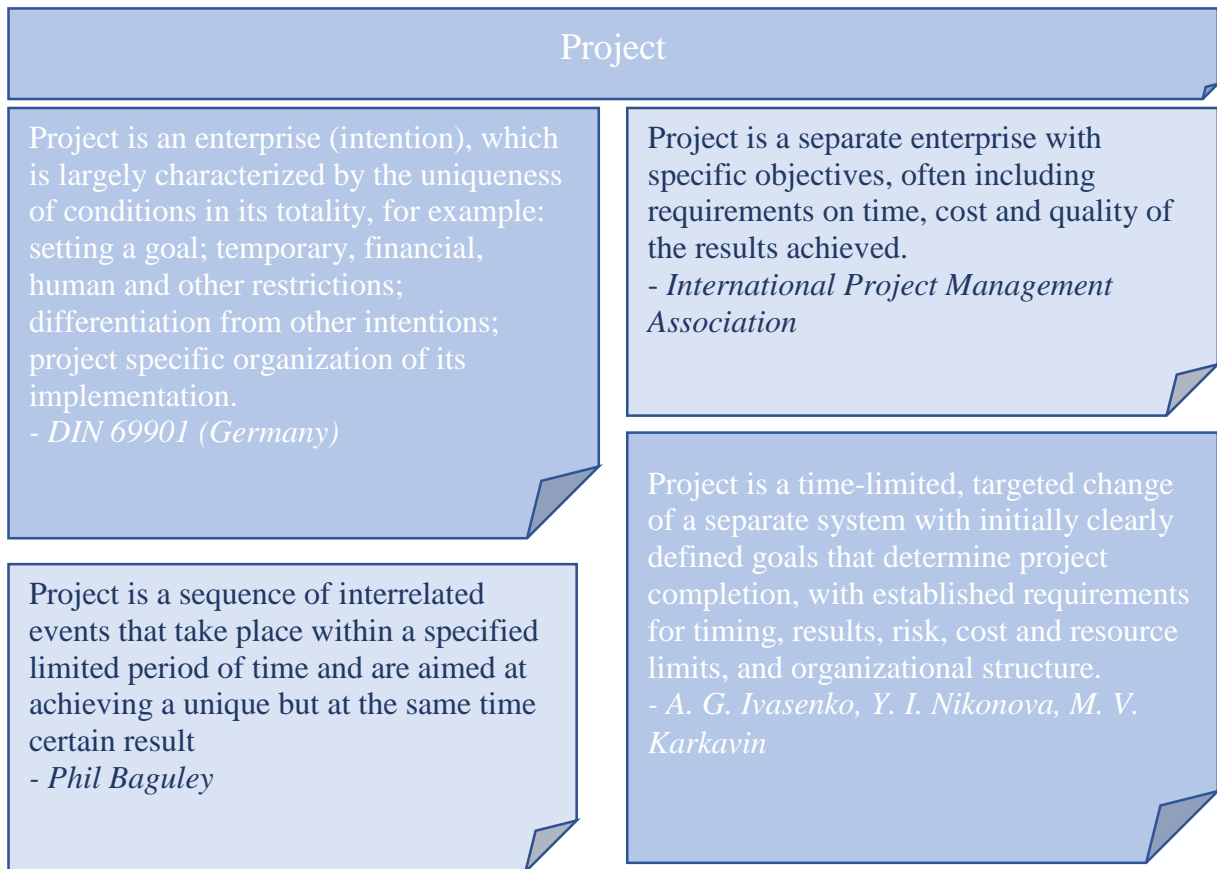


Image 1.1 The definitions of project management

However, the main one that we would like to highlight states that a Project is a temporary endeavor undertaken to create a unique product, service, or result. The two most important factors within that definition are depicted on the Table 1.3.

Table 1.3

The key factors of a project

Project	
Temporary	Unique
A project has a fixed beginning and end. Because of this, there are two factors that come into play in virtually every project: Time (deadlines) and money	No two projects are the same. Some projects are derived from previous projects (therefore similar) but they are never exactly the same. Even if you had, for example, a project

(budgets). These two factors are also fixed, and the muddier these boundaries are, the more potential there is for conflict among stakeholders.	to produce 100 widgets for a customer, and then you are given another project to produce the same 100 widgets for the same customer, these are still two separate projects because they have separate schedules (deadlines).
---	--

Each project has its own Life Cycle. According to the Project Management Body of Knowledge (PMBOK), the foundation of project management rests upon the five phases that every project goes through:

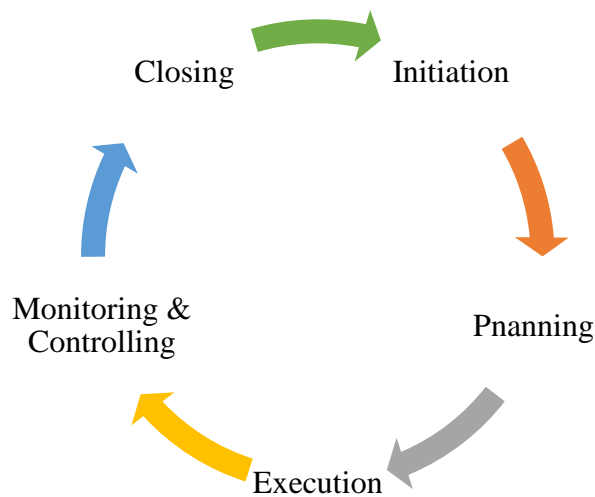


Image 1.2 The project life cycle five phases

1. The project initiation. Project creation, initial funding of the project and authorization of the project manager.
2. Project Planning. The creation and approval of the project management plan.
3. Project Execution. The production of the deliverables.
4. Monitoring & Controlling. Ensuring the project stays within the boundaries of the project management plan.
5. Project Closing. Releasing project resources.

The phases described above are presented in the in sequential order except #3 (Execution) and #4 (Monitoring & Controlling) which in most cases are performed in parallel. Nevertheless, the sequence may be restarted during the whole project life cycle, e.g. after completion of a large project stage, the project may return to the planning stage. Let's view the each of the Project Life Cycle in more details.

Project Initiation.

In this first out of five project management processes, the project is created and defined to the extent necessary to begin planning the project. This step involves the project setup and ensures that the performing organization is clear about the purposes and priorities surrounding the project. There are usually certain issues that require setup, like funding or stakeholder issues.

This is a small but necessary step, and its importance is easily underestimated. At this initial stage of the project life cycle, the project is defined, created and initialized. Funding is determined and the project manager is authorized. The initial result of this phase is called the project charter. The project charter is created out-of-project (will be described in more details below). It is used to facilitate communication between management and provides the information presented in the table 1.4 below.

Table 1.4

The data point that must be determined at the initiation stage

Data point	Description
Scope statement	In spite of the fact that the final statement of work volume is determined at the stage of project planning, at the initiation stage it is required to indicate the volume of work at a high level in order to inform the management about what it considers by creating the project.
Stakeholders	Important stakeholders are involved from the very beginning of the project development, so they must be clearly identified.
Funding	Along with a funding statement, funding levels should be finalized after project planning is complete, but the funding levels may indicate what the management team expects when the project is created, so it can be a strong part of the project charter.
Project Management	The project manager is assigned and their authority is given.

Authorizations from the performing organization are given and funded. It will define the guidelines and criteria under which it will operate. This phase includes the following tasks:

1. Feasibility studies are performed to determine the economic viability of the project
2. Funding is finalized
3. An initial scope statement can be made, because executives generally have an idea what the project should accomplish when they authorize it
4. Any initial project boundaries are determined
5. Stakeholders are identified
6. Project offices are set up

As it was mentioned above this phase produces a document called a Project Charter. This document contains the relevant project authorization and funding information, as well as scope statements and the like, to get the project going.

The Project Management Body of Knowledge (PMBOK) identifies only two processes within this phase.

1. Develop Project Charter
2. Identify Stakeholders

Developing the Project Charter.

Before a project even begins, a project charter is a document that incorporates the project and appoints the project manager.

Many projects operate without a project charter, even multimillion dollar projects. But the formal authorization of the project by the performing organization can be important - to ensure the lines of authority are clear and identify what the organization is implying as the reason the project was initiated. In practice there are a number of project issues that could have been avoided if the project manager and/or sponsor would have created one.

In the Project Management Body of Knowledge (PMBOK), the tasks involved with developing a project charter are contained within its own process - Develop Project Charter, which falls within the Project Integration Management knowledge

area. It is one of only two processes within the Project Initiation process group. The project charter itself is the output to the process, described in section 4.1.3.1 of the PMBOK [16].

PMBOK, 5th Edition, Section 4.1.3.1, «Project Charter» identifies Project Charter as the document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities. It documents the business needs, assumptions, constraints, the understanding of the customer's needs and high-level requirements, and the new product, service, or result that it is intended to satisfy, such as:

1. Project purpose or justification
2. Measurable project objectives and related success criteria
3. High-level requirements
4. Assumptions and constraints
5. High-level project description and boundaries
6. High-level risks
7. Summary milestone schedule
8. Summary budget
9. Stakeholder list
10. Project approval requirements (i.e. what constitutes project success, who decides the project is successful, and who signs off on the project)
11. Assigned project manager, responsibility, and authority level, and
12. Name and authority of the sponsor or other person(s) authorizing the project charter.

Often a contract between an owner organization (such as an oil company) and a project management organization (such as an engineering firm) can seem to take the place of a project charter. But the PMBOK states that a project charter should not be substituted by a contract because there is no exchange of money. The contract states the project's firm deliverables, whereas the project charter has the project

management function of building the project on a firm foundation, therefore the two documents should be kept separate.

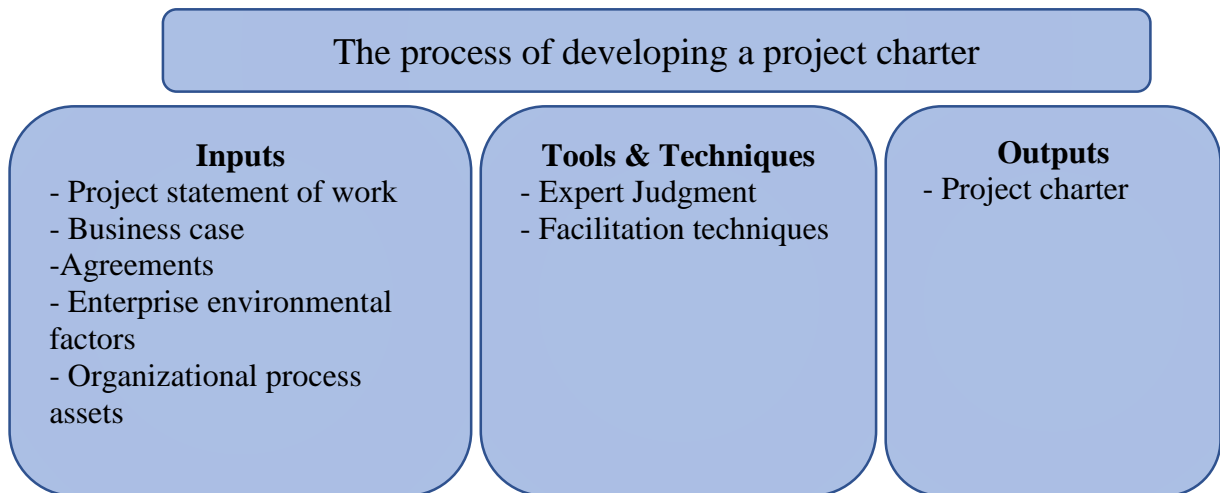


Image 1.3 The process of developing a project chapter

The Project Charter is the document that defines and authorizes the project. It describes the organization's vision of the project and the project's business model. In fact, it represents what the organization thinks about when creating a project and sets the foundation at the planning stage. The process of a project charter creation is show on the image 1.3 above.

It may contain the following items:

Scope Statement - A general scope statement which identifies the vision for what the project will accomplish. For example, the construction of a new commercial building may include a certain number of offices, design to a certain standard, etc. It is a good idea to define key results, but defining all results is not a function of the project charter. It should be limited to non-negotiable documents, such as submission of the project package for approval before construction starts. The final statement on the scope of work will be developed for the project at the planning stage, but the project charter can (and should) define the scope of work on the project as it was supposed at the time of project creation.

Milestones - Just like deliverables, major milestones can and should be defined in the project charter, but listing all milestones is not part of the project charter. The project charter should not contain a detailed schedule, but a description of the milestones can help in distributing information about the project, as provided by the organization.

Business Case - Description of the reasons why the organization implements the project is beneficial in order to put everyone on the same page from the very beginning. Business metrics such as expected profit or income or required Return on Investment (ROI) can give project managers a clear idea of what the expected benefit will be. There may be one problem that is being addressed. Explicitly pointing out the problem may help make decisions during project implementation.

Funding amount - The majority of projects start with the level of financing approved by the organization. Specifying the budget in the project charter can set project boundaries; to ensure and put a transparency on the solutions and/or approaches that would be accomplished further on the project planning phase.

Funding status - Funding is always provided under certain conditions, even if the budget is already approved. There are examples of a projects that have a certain level of funding approved, but later, face financing problems, for instance:

- Money is transferred to the next fiscal year and ends with other projects.
- In case of increase in value, no unforeseen circumstances arise.

Success Criteria - Each project contains criteria for its success and the organization implementing the project must define them at the level «outside» the project (i.e. in the project charter). Usually there are such basic success factors as smooth road laying or creating a beautiful website. But it is the secondary success factors that are usually overlooked and pose greater risk to the project. They may include ensuring sufficient compaction of asphalt concrete or providing the right database.

Stakeholders - Although the project charter does not define all stakeholders, it should define the main stakeholders that are an integral part of the project and under whose auspices the project was created. For example, for road construction

project, the developer is the sponsor of the project, and the city (local authorities) is the main interested party to which the project charter should address. The main goals of each party should be defined so that it would be clear why the project was created.

A project charter have to contain the information presented in the table 1.5 below.

Table 1.5

The data point a project charter ought to cover

#	Data points	Description	Responsible person
1	Project purpose or justification	Stating the business need that the project addresses can give everyone direction and clarity regarding project decisions and build a foundation of strong leadership from the performing organization. When everyone knows why the project is being performed, they can be laser-focused on the end result.	Client, Project manager
2	Measurable project objectives and related success criteria.	A statement of the project's goals and criteria for success creates a strong statement of what the company is expecting from the project. It ensures everyone is working toward the same goal and is clear on what those goals are.	Client, Project manager
3	High-level requirements	'There are several components that have a place within the project charter (i.e. above the project) as well as the project management plan (i.e. within the project). The project requirements as envisioned by the organization can be placed within the project charter to make it clear what the organization is thinking by creating the project.	Client, Project manager
4	Assumptions and constraints	Many project issues arise from unclear assumptions, and many of these assumptions are clear to the management of the organization before they create the project. Therefore, they should be stated within the project charter and thereby passed down to the project management plan.	Client
5	High-level project description and boundaries	A high level scope is generally defined, if not on paper than in executive's minds, well before the project becomes a project. Writing this scope into a project charter makes it crystal clear what the project's creators are thinking. It should not, however, be considered a final project scope.	Client, Project manager

6	High-level risks	Most projects have one or two major risks that define the project. For example a structural failure for a bridge overpass project, or website payment software that contains security glitches. These are the risks that are fundamental to the project's success and are generally thought about before the project becomes a project. Therefore, they should be included within the project charter, but they should not take the place of a project risk analysis within the project management plan.	Project manager, Project lead
7	Summary milestone schedule	Most projects have milestones that are defined by executives before the project becomes a project, whether explicitly stated or implied. For example, a mine access road needs to be completed before construction equipment can move in. These milestones define the project and should therefore be placed into the project charter, however, they do not take the place of a detailed project schedule during the project planning stage.	Project manager, Project lead
8	Summary budget	All projects are created in the context of organizational budget constraints. This context should be communicated within the project charter in order to pass on the budgetary constraints into the project planning phase.	Project manager
9	Stakeholder list	Most projects have one or two major stakeholders that need a lot of attention. Although the project charter is not the appropriate place for a comprehensive list of all stakeholders, the ones that are of primary importance to the project should be identified.	Client, Project manager
10	Project approval requirements	Because most projects require approval from external authorities, those approvals which will have a major impact on the project can be explicitly stated within the project charter. For example, in the mine building project mentioned above, the government approval for mine construction is so integral to the project that it could be mentioned in the project charter. The project charter is not the place for a comprehensive list of approval requirements, though.	Client, Project manager
11	Assigned project manager	As stated in the PMBOK above, one of the primary purposes of the project charter is to assign responsibility to the project manager. Therefore, the project manager should be named and their authority to use organizational resources should be made clear.	Vendor

12	Project Sponsor	The project sponsor is one level above the project manager, often an organization contact for the project. They should be named and their responsibilities in regard to the project made clear.	Vendor
----	-----------------	---	--------

The other process that should be performed on the initiation phase is Identifying Stakeholders.

The PMBOK contains stakeholder identification as the only other process within the initiating phase, hence it has special significance to the project charter, even though it is listed among the other items, above. I concur that it is a good idea to conduct a stakeholder analysis to determine all of the stakeholders as part of the development of the project charter.

Stakeholders come in many forms and have vastly different needs as it relates to the project. There could be the following two types of Stakeholders, depicted on the image 1.4 below.

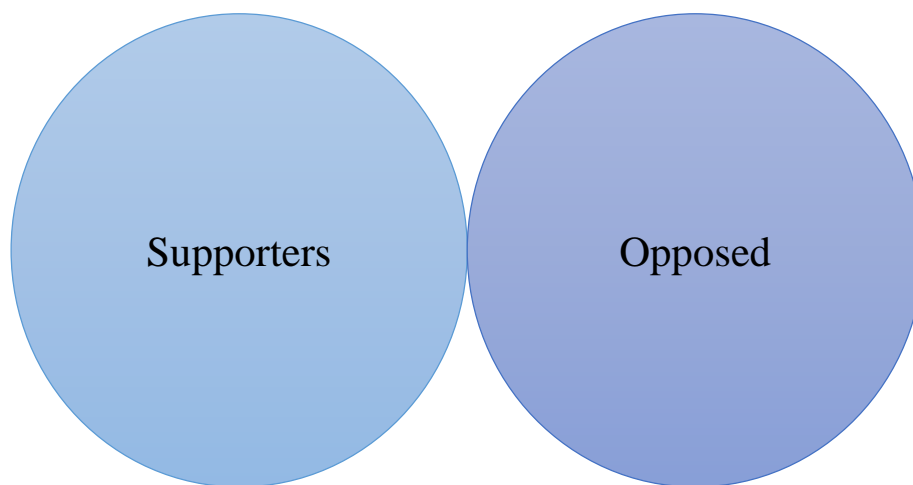


Image 1.4 The two types of Stakeholders

For example let's take a data mining project: Supporters – a company that is interested in obtaining valuable information for their leadgeneration. Opposed – the recourse that is about to be scraped.

They can also have varying levels of support. We don't know how strongly stakeholders support or oppose the project until you consult with them. Many

projects have run into trouble because assumptions were made about stakeholder interests that were not based on direct communication with those stakeholders.

Often the overall stakeholder position is complex because there are conflicting opinions within the stakeholder itself. For example, the county that will receive tax revenue from a new plant could have a contingent of taxpayers who are strongly opposed, pulling the politicians in different directions than they originally state. It can also cause changes to the stakeholder's position during the project. Therefore it is often advisable to analyze the underlying factors governing a stakeholder's position, even for stakeholders that are supporters [26].

Project Scope Statement.

Naturally the team produced several reasons, to a change schedule and budget that was approved. This process happens countless times at project-based organizations as well as with internal projects. But it's also a certain path to poor project performance. Scope defines the boundaries of the project, and if it is not actively defined and managed the project will undoubtedly go behind schedule and/or over budget.

Since a project is defined as a temporary activity to create a unique product, service or result, the project scope is fundamental. It defines which work is part of the project and which is not. It defines the objective of the project, what it will do, and how it will do it. In fact, it defines the project.

Why Scope is Important: the Institute for Project Management notes that competitive changes in the scope of the project are the single largest cause of failures in its implementation. Poorly defined project boundaries or boundaries that move around the project may cause the project and career to collapse. This can happen in any industry, so strong project managers must learn how to define, communicate, and control the scope of a project.

To avoid bad opportunities that arise because of badly defined project volume, project managers need to write good volume statements. This will make it easier to get the approval of the project volume from the project stakeholders. It also synchronizes the work of the project team, but most of all it will prevent

unauthorized tasks from appearing in the project, thus absorbing project time and money (evil «volume slider»).

In fact, there is no substitute for the written definition of project boundaries, so it will be clear to everyone what is part of the project and what is not.

The minimum length of work volume description is what reduces the main risks for the project. For example, a statement that your project should «build a fence» will convey basic information, but it is not enough. Everybody already knows this information - there is no value in it. It would be better to determine the start and end points, the height of the fence, the depth of the poles, the type of fence, weather assumptions, etc., which in the future could reduce the risk of an adverse change in scale. A complete scope statement includes the following things:

1. Overall description of the work. This is where you state that the project is to «build a fence».

2. Deliverables. What will be produced by the project, and what are its key features? Also, what client need is the project satisfying?

3. Justification for the project. In order to provide a complete understanding of the scope, sometimes it is necessary to dive into the justification of why the project was initiated in the first place.

4. Constraints. If the project faces certain physical boundaries, these can be a source of risk and thus should be defined further.

5. Assumptions. All projects have assumed certain conditions as part of their existence. For example, the fence building project has assumed good weather, availability of tools, etc. What are those assumptions and what impact does their inaccuracy have on the project?

6. Inclusions/Exclusions. Many projects have items that are uncertain because projects of that type/size sometimes do and sometimes don't include those things. They need to be explicitly included or excluded from the project [8].

It's also helpful to borrow from our friends in the corporate strategy department and concentrate on SMART goals:

1. Specific. The more specific the better.

2. Measurable. If you can't measure it, you have no way of knowing if it was achieved. Sometimes the best criteria are qualitative, but use quantitative descriptions whenever possible.

3. Achievable. It's surprisingly easy to commit to something you don't have the expertise to complete.

4. Relevant. The scope should focus on completing the goals of the client/owner, and avoid tasks that do not add value.

5. Time-Bound. A project is by definition temporary and thus has a time limit. I would consider this optional but it certainly doesn't hurt in a scope statement.

When writing the scope statement we usually don't know all the project boundaries. For example, in the fence building project, you might not know how high the fence is to be. This is okay, but just like the marathon runner who must avoid the temptation to be in the lead during the race, the project manager must be aware of the risk involved in excluding this information from the scope statement. The project manager must realize that all project uncertainties are risks to become cost or schedule issues. In an ideal world, every project is completely defined, but this is an ideal that is not always possible nor necessary. That being said, uncertainties can be dealt with in several ways:

1. Accept. The project takes on the risk of uncertainty. For example, if the owner requires a bigger fence than anticipated, you must swallow the cost.

2. Transfer. Let a third party assume the risk. For example, approach the other neighbor to see if they will chip in over and above a certain cost.

3. Mitigate. Perform actions that will reduce the risk of uncertainty. For example, ask the owner how big of a fence they would like to build.

When uncertainties are not defined in the scope statement they can be good candidates for inclusion into the project risk register.

Here are a few examples of what could be considered as a good scope statement:

1. Example: The project involves building a fence between the house at 10 ABC Boulevard and 12 ABC Boulevard. The fence will consist of steel posts within

concrete-filled holes. The fence will be built out of cedar and it will be 8 meters tall. This is anticipated to keep the dog at 10 ABC Boulevard contained within the yard at a reasonable cost. The fence will be located as close to the property line as possible and reach from the garage on the west side to the house on the north side.

2. Example: This project is for the creation of a construction safety app for cell phones. There will be an app for iPhones and Android-based systems. The user interface will be designed as part of the project but will contain, as a minimum, the ability to create and edit tailgate meetings, field-level hazard assessments, safety inspections, and audits. Each of these will have a built-in checklist for typical projects in typical industries. There will be a corresponding web application whereby anyone using the app can log in to view and print the reports. The app must include a tutorial to make it easy to get started [28].

Project Planning.

Since most of the problems related to the project can be traced back to the lack of planning, this phase should receive the necessary attention that it deserves. The project manager or management team prepares a project management plan that informs all stakeholders about what the final destination will be and how to achieve it. The project management plan is a living document that is updated as the project details change.

Table 1.6

Parts of a project management plan

#	Data points	Description
1	Critical Success Factors	The definition of project success: most projects have the budget and schedule as major success criteria, but there are almost always others, like product quality, satisfied stakeholders, or employee career advancement.
2	Scope Statement	The official project scope statement is developed within the project management plan. You can't define every nut or bolt, but the more defined the boundaries of the project are, the better.
3	Deliverables	This refers to the items that the project will produce. It can be tangible, like a fence, or knowledge based, like a training course.
4	Budget	The overall project budget required to perform the work is defined within the project management plan
5	Schedule	The overall schedule, including milestones, required to perform the work defined in the scope statement.

6	Quality	The quality level of the deliverables. There is almost always a trade off between high quality deliverables and cost, and the target location on this spectrum should be well defined.
7	Communication	Usually the degree and quality of communication plays a huge role in project success. Therefore, identifying communication requirements during project planning is a smart thing to do.
8	Risk	Good project managers know what the major risks to the critical success factors (see above) are, and have a plan so they don't fly by the seat of their pants when the issues inevitably arise.
9	Project Control	Since keeping projects on budget and schedule (as well as the other critical success factors) is so important to successful projects, the project management plan contains details about project control, usually in the form of earned value management.

The project management plan is given approval by the project sponsor (or performing organization). It is also distributed among other stakeholders (as necessary) to communicate the project management team's intentions.

The Project Management Plan is the master planning document which establishes how the project will be managed. In the PMBOK, this is the only phase in which all ten knowledge areas are used. The 12 essential components of a project management plan are:

1. Scope Statement. This is a written statement of the work that the project encompasses. It should be clear to the reader what work is and is not part of the project.

2. Critical Success Factors. Budget and schedule are generally high on the list, but things like the satisfaction of certain stakeholders, preservation of the environment, or development of the project team members should be identified.

3. Deliverables. These are the products the project was commissioned to produce. They should be listed and their key features described to ensure there is no confusion.

4. Work Breakdown Structure. The project is broken down into applicable phases and tasks to facilitate planning and tracking.

5. Schedule. Each task is given a start and end date, which allows the project manager to estimate the completion date of the project.

6. Budget. Each task is assigned a budget, which allows the project manager to estimate the overall cost of the project.

7. Quality. Project quality criteria are assigned to each project deliverable, and the measurement criteria are determined.

8. Human Resources Plan. The project team needs are determined and the team members are acquired.

9. Stakeholder List. The project's stakeholders are listed and their needs, wants and level of influence are analyzed.

10. Communication Plan. The project's communication needs are itemized and tracked.

11. Risk Register. The risks to the project's critical success factors (see above) are itemized and analyzed according to priority using the two components of risk, probability and impact.

12. Procurement Plan. The project's purchasing needs are determined, terms of reference are written and bids are solicited. This is not an exhaustive list. The project management plan should outline anything that is relevant to the stakeholder's perception of how the project will be managed. It is highly specific to individual industries and organizations. It should be distributed to the major project stakeholders, including the project sponsor, and receive their approval prior to project execution.

Scope Statement. Every tool purchase, equipment rental, employee wage, cup of coffee or any item of expense must be defined as either a part of the project, or not a part of the project. This is one of the fundamental responsibilities of a project manager, to know and maintain the boundaries of the project. In fact, scope definition issues are the number one cause of project distress, which is why the scope statement is one of the most important parts of a project management plan (and why I include it first).

Critical Success Factors. There isn't one specific criteria that defines success for all projects. Thus, you need to make sure you define success for yours.

Since a project is defined as a temporary endeavor, time and cost are usually high on the success criteria list. The client wants to receive the deliverables at a

certain date, and they want to pay a certain cost for them. Other items that can define project success are:

1. Deadlines (time)
2. Budget (cost)
3. Quality standards
4. End user benefits
5. Minimal change orders
6. Low rate of product rejections
7. Employee satisfaction

Here are some examples of critical success factors:

1. The project will be completed by December 31.
2. The app will accomplish the required tasks with the least amount of clicks/taps.
3. The project team will obtain new skills in the area of database management which the larger organization will benefit from.

Deliverables. Deliverables are the products, services, or results that the project is commissioned to produce. The project «delivers» them to the project sponsor who commissioned the project. Thus, all projects have deliverables that should be spelled out in detail within the project management plan. Also, details about the quality, size, length, or other standards can provide an important context.

Here are some example of project deliverables:

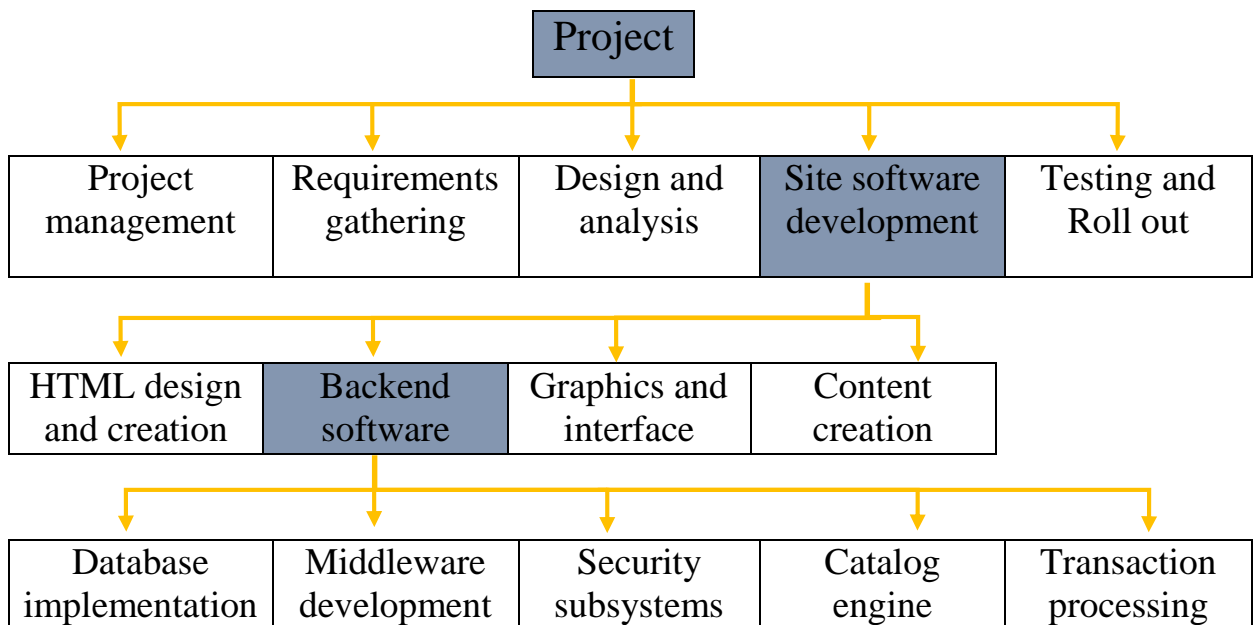
1. An 8-foot high fence
2. A cell phone app
3. A training course
4. Accurate weather forecasts

Work Breakdown Structure. The foundation of the effective management of projects starts with the creation of a WBS, which is a logical subdivision of the project into tasks. Management of the project is then done on a task by task basis.

For larger projects you could also produce something more applicable to their size. See the example presented of the table 1.7 below.

Table 1.7

Example of WBS #1 (diagram)



It can be as simple as a list of tasks (e.g. table 1.8). Task ID's can be in any format (1, 1.1, 1.1.1. or A, A1).

Table 1.8

Example of WBS #2 (a list of tasks)

ID	Task	Dependencies
01	Excavation	
03	Build Forms	01
04	Place Rebar	01
06	Pour Concrete	02, 03
07	Setting & Curing	04
08	Strip Forms	04

Schedule. Since projects have a defined beginning and end, the schedule is usually an important piece of the puzzle. Often external stakeholders are involved in the determination of the deadline dates. Likewise, changes in the schedule mid-project are usually issues that require active management.

Developing a project schedule does not have to be a major undertaking involving expensive project management software. Whatever accomplishes the goal

of communicating the project milestones and deadlines to the applicable stakeholders is good enough. For small projects, the WBS can simply be expanded to include the deadline dates. For larger projects a graphical schedule could be more appropriate.

If the project's budget and/or timelines permit you could purchase project management software and learn to produce professional-looking schedules. Microsoft Project is widely used across all industries. There are also many industry-specific project management software products such as Primavera P6 which is popular in the construction industry. Also, there are some internet-based scheduling tools like Tom's Planner which are easily accessible at any time.

Budget. The temporary nature of a project requires that a well-defined budget is in place and that it is actively managed to keep it from sprouting roots and growing like an obnoxious weed. Just like the schedule, for small projects the budget can be added to the WBS.

If you're using the earned value method to track and manage the project, this budget column would be called «Budget at Completion», or BAC for short.

Quality. When a project produces a deliverable there are always quality standards in play. For example, if the fence-building project produces a fence that is not straight the neighbor will complain and probably want a new fence (if it's bad enough).

What are the quality standards for the project: These should be itemized and listed. Every industry has standard quality success criteria which can be looked up and specified for the project with relative ease, like ASTM, IEEE, or ISO-9001. These organizations are in the business of developing quality standards, thus they are fantastic sources for ensuring project quality.

Also, there are several aspects to quality management:

1. Determining quality standards
2. Developing a strategy to meet the standards (quality assurance)
3. Measuring quality (quality control)

Each of these items should be addressed within the quality section of the project management plan. Quality control results should be actively documented throughout the project, and changes in strategy should be updated within the project management plan.

Human Resources Plan. The project team members are often one of the most critical components in the chain of successful projects. They are also usually very time consuming for the project manager – whether hiring new workers or obtaining them from the larger organization, they must be trained and their productivity needs to be actively managed.

The human resources portion of the project management should contain the following items:

1. **Resource Requirements.** A list of project team positions, job descriptions, and so forth.
2. **Project Team Acquisition.** How the project team will be acquired. Lists of positions which are already occupied from the larger organization, how much time each person will devote to the project, where the project team will come from, and so forth.
3. **Training and Development.** How you will ensure that the project team has the ability to successfully carry out the project.
4. **Management.** Motivational activities, performance assessments, staff reassignment procedures, and any other item that is relevant to the successful management of the project team.

Stakeholder List.

In some industries there tend to be so many stakeholders it can make your head spin. The government client (owner) wants to spend the least amount of money but the government regulator (from the same department) wants to invest in environmental mitigation. The adjacent landowner wants to get rich, the power line needs to be moved, the gas line requires meticulous contracts, and the railway company throws out all your deadlines because it can't be bothered with your project.

In fact, if you would keep stakeholder lists you would find that they have grown throughout the project, almost without exception. In other words, it's easy to forget a few small ones and it's inevitable that those small stakeholders will have a disproportionately large influence on the project outcome.

For that reason, the stakeholder list should be developed and stored within the project management plan and consulted regularly. A proper stakeholder analysis includes a classification of the stakeholders power to influence the project as well as their level of interest in it.

Table 1.9

The example of stakeholders' classification

Stakeholder	Power	Interest	Concerns
State of Blue Sky (Owner)	High	High	On time On budget Minimal project issues No bad publicity
Landowner	Medium	Low	Highest possible price for land
Gas Utility	High	Low	Lots of lead time to move gas line Safe access Comprehensive agreements

Notice that the owner is a stakeholder in this table, although technically they occupy a special role. They commissioned the project and the project sponsor works for them. The project deliverables are produced for them. But including this special stakeholder in the project stakeholder list ensures that their needs are considered regularly just like everyone else's, therefore I advocate for this practice.

Communication. The biggest source of project issues tend to be the project scope, deadlines and budgets. But poor communication makes it worse, and often the lack of communication is the only reason an issue arises. That's why communication is one of the most important aspects of the project management plan.

Obviously the project manager should contact stakeholders when an issue arises that concerns their interest in the project. In that case the project manager must simply pick up the phone. Nobody could have any earth-shattering wisdom. So

stakeholders should be ready that things are not going according to plan and we should keep them informed throughout. It's human nature to want to avoid telling the bad news but this is when contact is the most important. Avoiding it will only create an environment whereby issues will arise much quicker in the future. Although this is the most important type of communication of all, there is usually nothing specific that can be entered into the project management plan.

However, every project has regular communication needs that should be addressed within the project management plan. These include things like project updates, investor circulars, progress reports, and so forth.

The project management plan should contain a list of formal communication that are core to the project. In the table 1.10 we have displayed an example of a list of formal communication.

Table 1.10

The example of a list of formal communication

Name	Recipient(s)	Frequency	Medium	Contents
Progress Report	All stakeholders	Monthly (last day of the month)	Pdf via email	CV and SV, discussion of last months tasks
Investor Circular	Project investors	Monthly (first day of the month)	Email	Cost Variance (CV), discussion of cost status

Risk Register. Above everything else a project manager is a leader, and one of the most important traits of leadership is to prepare for the unexpected. Taking fast, decisive action when things go wrong is one of the most important traits of a leader, and therefore a skill you need to learn if you want to be a top notch project manager.

The proper way to manage risk is through the creation of a risk register. This fancy-sounding word simply means a listing of the most important risks to the successful completion of the project. Remember the critical success factors, above? Any item that can negatively influence the success of the project is considered a risk.

Clearly it is not feasible to attempt to identify all risks to a project – Maybe a plane will crash into your office. But the importance of a risk is defined by two factors:

1. Probability
2. Impact

Obviously, a plane crashing into your office has a high impact (severity) but a probability so low as to eliminate it from consideration in your risk register [21].

Analysis of risk is a complex field with many books written about it, but for most projects a simplified process works very well. The risk register contains the following fields:

Description of risk. The final list of risks is determined via brainstorming, subject matter experts, analysis of previous projects, and so forth. A maximum of 20 risks should be used as a guide, but usually you will want to quit at about 10 because they get pretty remote.

1. Probability. A scale of 1-10, A-E, or similar will classify the risk sufficiently.

Impact. A scale of 1-10, A-E, or similar will classify the risk sufficiently.

2. Priority. The Probability is multiplied by the Impact to determine the overall priority. But re-classifying them into a 1-10 scale usually makes sense. The list is then sorted by priority.

3. Triggers. The actions or events that define the occurrence of the risk are identified. For example, if you're building a fence and the risk is that it starts to rain, how much rain makes you have to stop? What defines the risk as having occurred?

4. Response plan. This is where you develop a plan to deal with the risk. What are the action steps that will be followed when the trigger is deemed to have occurred? Who will perform those actions, and who are all the stakeholders that need to be notified?

The last two items are often too big for the table but should be itemized separately to ensure all of the requisite information is present. Example is presented in the table 1.11 below.

Table 1.11

The risk table example

Risk	Probability (1-10)	Impact (1-10)	Priority (1-10)	Triggers	Response Plan
Rain delay	7	4	7	Small drizzle, too muddy to work	Wait for rain to stop
People are re-deployed off the project	8	7	9	Manager calls employee back	See separate response plan

Procurement Plan. Many projects have sub-consultants, sub-contractors, and suppliers. The project management plan should identify the following things:

1. What outside products and services are required.
2. How they will be procured.
3. How their progress and quality will be monitored.

Outside contractors usually don't have the same focus on quality and timeliness that the performing organization does, thus management becomes a more important issue [7]. Generally speaking, the procurement process goes like this:

Develop a Statement of Work (SOW). The SOW has many synonyms, like Terms of Reference, scope statement, Request for Proposal (RFP), and others. But it is simply statement of what work the outside contractor must perform. Usually the technical details are kept separate from the contractual stuff (bidding procedures, insurance requirements, etc.) because an engineer will write the technical part and a lawyer will write the contractual part. Because of this the terminology has also become separated. The technical details are called the SOW or the Terms of Reference, and the contractual stuff is called Request for Proposal, Request for Quotation, Invitation to Tender, and the like.

Perform the Procurement. Once the Request for Proposal (RFP), which includes the Statement of Work (SOW) is finalized, it is sent to the bidders to perform the procurement. Once the bids are in, a winning bidder must be chosen. Always make sure you write into the tender and/or SOW that you are free to pick

any bidder rather than just the lowest, because if you don't you will be forced to pick the lowest (in most jurisdictions).

Progress Payments. Normally contractors are paid based on the amount of work completed per month (or some other time period). There might be some documentation required but the invoice is sent, the progress is verified and the bills get paid.

Notice that the when it is written, the statement of work tends to be perceived as a document that describes the work to be done, not necessarily the boundaries of the project. But establishing effective boundaries is extremely important. Every word will be scrutinized when the contractors are preparing their bids. It is remarkably easy to leave a little bit of room for interpretation, which results in the potential for an unscrupulous contractor to win the job with a lower price and then make a claim for more money when a certain work item is «out of scope». This dance takes place every day on large construction projects.

The SOW continues to be scrutinized word by word throughout the project. Any little piece of work that was not envisioned at the outset can result in a change order, that is, additional cost, if the relationship is not strong. Thus, it is an important component that must be reviewed and analyzed in detail before it is released.

Mastering these 12 core components will ensure that your project will get as close as possible to «managing itself». Once the project management plan is in place, ensuring the project sticks to the plan is the domain of earned value management.

Project Execution.

Upon completion of the project management plan, the project proceeds to the execution phase. In this phase, the deliverables are produced and delivered to the client or customer, often the project sponsor.

During project execution, the quality of the deliverables being produced must be measured via Quality Control measurements. Also, the production system is audited via Quality Assurance.

Also, the project manager must ensure communication is carried out according to the project management plan. Stakeholders are notified of key project activities, and status updates are circulated to investors, financiers, or senior management.

The project team must be acquired and developed to ensure the required knowledge is available to finish the project. Most projects require some form of training or knowledge acquisition that isn't already available. Additionally, the project team requires motivation and career advancement or they will not be available to finish the project [10].

Project Monitoring and Control.

Throughout the project, the project manager must monitor and control the project work to ensure that project deliverables are on time, on budget and of acceptable quality. Also, stakeholders must be kept satisfied and the project team must be kept motivated and coherent. Monitoring and Controlling the project work occurs concurrently to the Execution phase, therefore the two Process Groups occur in parallel.

Because a project is defined as a temporary endeavor which produces a unique product, service, or result, there are two variables which inevitably factor high in the project success criteria:

1. Schedule
2. Cost

To ensure a project finishes on time and under budget, the PMBOK utilizes a method called called Earned Value Management. This method involves defining a time interval, usually one week or similar, and compiling two things:

1. The percent complete of each task.
2. The actual cost of each task.

Then the earned value metrics are calculated which tell the project manager how far ahead or behind schedule, and above or below cost, the project is relative to its planned schedule and cost at that point in time.

Project Control refers to the tasks performed by the project manager to ensure the project remains on schedule and budget. This is one of the most difficult aspects of project management and consumes a large part of project management training courses. Project management methodologies use Earned Value Management as the standard to achieve project control.

In earned value management, the management team measures three variables from each project task which are listed in the table 1.12 below [23].

Table 1.12

The measures used in the project management plan

#	Value	Meaning
1	Planned Value (PV)	Where the task is supposed to be according to the schedule.
2	Earned Value (EV)	The amount of actual work completed on the task.
3	Actual Cost (AC)	The to-date cost of the task. This information is used to produce the following metrics, which give you a snapshot of where the project is right now.
4	Cost Variance (CV)	The amount over or under budget, at the point of analysis (absolute value).
5	Cost Performance Index (CPI)	The amount over or under budget, relative to the size of the project (relative value). In practice, this is an efficiency factor measured against the schedule.
6	Schedule Variance (SV)	The amount ahead or behind schedule, at the point of analysis.
7	Schedule Performance Index (SPI)	The amount ahead or behind schedule, relative to the size of the project. In practice, this is an efficiency factor measured against the project schedule. Following this analysis, the following four metrics attempt to estimate future project performance.
8	Estimate at Completion (EAC)	The final estimated cost of the project assuming the current project performance continues.
9	Estimate to Complete (ETC)	The amount of money needed to finish the project.
10	To Complete Performance Index (TCPI)	The Cost Performance Index (CPI) is required to finish the project on time and budget, that is, the efficiency level required from the point of analysis forward to the end of the project. If changes are required to any part of the project as documented in the project management plan, they need to be documented and result in an updated plan. This includes changes to deadlines, costs, deliverables, and any other change to the project as originally envisioned.

Project Closing. The fifth and final project phase is closing the project. This may seem trivial, but most projects have requirements which cannot be overlooked

before the project can be closed. Contractual closure. The agreements need to be signed and completion certificates issued. Procurements. Subcontractors need to have their work accepted and they need to be formally released. Final details. Things like as-built drawings, database access, maintenance requirements and training need to be assembled and passed down. Liabilities. Warranties and bonds need to be executed. Insurance requirements must be met. Release of Resources. The project team, as well as equipment must be released. Lessons learned. If there is any information that will help perform future projects, it should be written down and passed on as necessary. As underrated phases go, Closing comes in a close second to Planning. There are almost always a handful of tasks involved in closing the project and moving on, and they are usually high on the visibility scale to executives and project sponsors. Releasing project resources. Transferring project documentation. Fulfilling contractual obligations and closing contracts. Submitting final details. Finalizing funding requirements. Documenting lessons learned.

As a summary of Project Management Documents in each phase, one or more project management documents are created.

These consist of the following phases listed in the table 1.13 below.

Table 1.13

The Project Management Documents in each phase of the project

Phase	Project Documents
Initiating	Project Charter
Planning	Project Management Plan
Execution	Status Updates Stakeholder Communications
Monitoring	Earned Value analysis Project change documentation
Closing	Final reporting

The planning group is by far the largest within the PMBOK, and is the most intensive for the project manager. It contains more than half of the PMBOK's 47 processes [20].

To conclude the information presented in the chapter one we would like to note that the project management as an independent discipline has a lot of aspects to cover, however, the project management in the IT sphere can be highlighted as a side standing branch of it. The practices that are applied specifically in the IT project management have already been introduced to the world's standards of project management and are widely examined by the numerous representatives whose professional activity is bounded with it.

CHAPTER 2

ANALYSIS OF THE ACTIVITIES OF THE STUDIED COMPANY «GROUPBWT»

2.1 General characteristics of the «GroupBWT»

The GroupBWT has been founded in 2009 in Ukraine, Zaporizhzhia. The company was founded by Eugene Yushenko, the graduate of Zaporizhzhia National University. At that time Eugene identified primary direction of the company - software development. The central office of the company was allocated in Zaporizhzhia. In the period of 2009 – 2016 the company step by step worked on creating a strong client base. Mostly it was done by the trial-and-error method – which is why, we believe, it took comparably long period, around 7 years.

In 2017 the management of GroupBWT, along with smaller projects, succeed to obtain the contract with World Health Organization (WHO) for creating a platform for the annual World Health Organization conference. One of the most challenging requests was to make the platform which could be integrated with technologies that have gone long beyond the practices used in software development today. Nevertheless, the company has been able to find the effective approach and successfully performed the project. The World Health Organization continues its business relationships with the GroupBWT for almost four years already. For its contribution to the development of the project GroupBWT was invited to take part at the annual World Health Organization conference in Liverpool at 2019 where the company showed an example of the platform they built by technological corporations.

From 2019 the GroupBWT could be recognized as a dynamically developing outsourcing IT company based in Zaporizhzhia, with affiliates and exclusive partners in the USA, UK, Latvia and Germany.

The company started as a small business consisting of 5 employees. As of 2018 GroupBWT was one of the top 10 best performing outsourcing IT companies

in Zaporizhzhia, with 40+ employees on board. By now in 2020, the number of employees of the company increased to 80+ employees.

According to the data that is publicly available we have described the profile of the GroupBWT company in the table 2.1 below [6], [31].

Table 2.1

The profile of the GroupBWT

The company's mission	With brilliance & dedication, our large multi-cultural team strives to achieve one goal — deliver meaningful solutions to help add value, optimize business processes and maximize profits for our clients.
The company's goal	«Provide services of the highest quality and excellent support to businesses in various industries by developing individual solutions, implementing a smart workflow and using the latest technologies. All this is the first necessity to achieve success and increase competitiveness in today's market».
The company's services	To help other businesses grow and achieve the best results, apply the expertise and knowledge combined with a sophisticated infrastructure and their own patented tools and techniques developed over many years in the following three areas: data mining, full cycle web development, and mobile development.
The legal status	LLC «GroupBWT»
The major activity	«Computer Programming»
The Organization structure of the GroupBWT	Weak matrix

The Organization structure of the GroupBWT.

Below we will present the organization structure of the GroupBWT management, the departments and their roles within the company's structure. Please note that the information provided represents not the standards of the IT business roles but rather the meaning that it holds for GroupBWT in particular.

As it is shown on the organization structure of the company's management scheme (the image 2.1) the GroupBWT has a weak matrix organizational structure.

The company has 6 main departments: Business Development, Marketing, Delivery, Project Management, Finance and Human Resource.

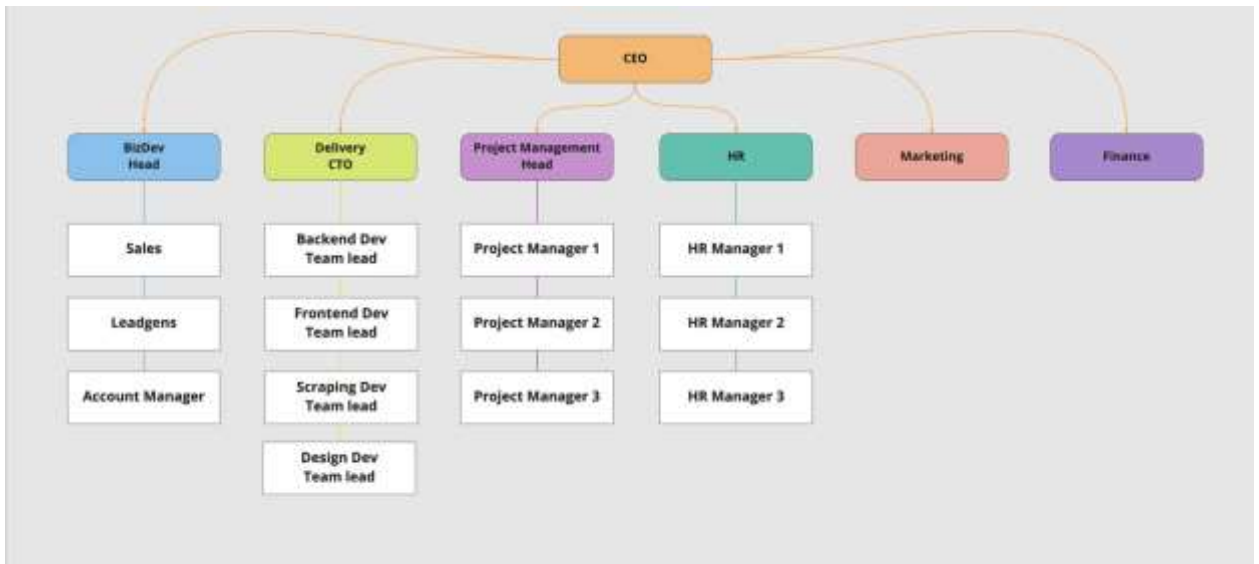


Image 2.1 The Organization structure of the company's management Scheme
(Weak matrix)

Roles of each department:

The Business development Department (BizDev). This organizational unit is mainly responsible for defining and developing new business directions - new markets, niches, partnership relations, sales channels, the development of the company's client base, attraction of new projects etc. The professionals of BizDev department at GroupBWT are split into two groups: Sales and Account managers. The account management representatives work with strategic partners, take part in closing of deals with key clients, building processes. Whereas the Sales ones are responsible for the attraction of new projects to the company.

The Marketing Department. The youngest department within the GroupBWT – was founded at the August 2020. This department plays an important role in promoting the business and mission of the company. It serves as the face of the GroupBWT, coordinating and producing all the materials representing the business. At GroupBWT the main focus of the marketing department is branding.

The Delivery Department. This department is responsible for the delivery of the final product to the client. IT delivery is the manner in which a corporation provides IT services, which include Frontend development, Backend development,

Data mining, Design, and Quality Assurance. The professionals of this department play role in various stages of service or product delivery.

The Project management Department. The project management department is committed to lead the project from the very first stages. It closely works with the BizDev sub department – Sales – in order to make sure that the project has everything that is needed to proceed with. Within the GroupBWT project management department does not have any standards, metrics or practices that are usually applied for managing the project in the IT company. We will review its peculiarities in 2.3 chapter.

The Financial Department. This department has been created in order to manage the financial flows of the GroupBWT. The financial department duties are the following: financial planning, reporting and controls, short- and long-term business strategy, hedging, cash management, internal risk management, corporate finance, auditing and accounting.

The Human resource Department. The main function of the HR department at the company is recruitment. Worth to note that the HR managers are also responsible to the Office management activities.

The recruitment part covers the following activities:

1. Determination of the organization's need in personnel;
2. Personnel selection together with the heads of other departments of the company;
3. Analysis of personnel turnover, search for methods to combat the high level of turnover;
4. Preparing the staff schedule of the company;
5. Registration of personal data of employees, issuance of certificates and copies of documents at the request of employees;
6. Carrying out operations with employment records (receipt, issuance, filling and storage of documents);
7. Onboarding the fresh members;

8. Maintenance of vacation records, drawing up schedules and registration of vacations in accordance with current labor legislation;

9. Organization of employee appraisals; preparation of plans for advanced training of employees;

10. Organization of any corporate activity (holidays, birthdays, conferences, etc.).

The GroupBWT financial results report analysis.

The peculiarity of most IT companies in the absence of a large number of fixed assets. This is not a factory and not a production company - the main asset are people, developers, project managers, QA, etc. It is their knowledge, skills and competences expressed in services for customers or products that generate income. The GroupBWT has two price formation patterns: Fixed Price and Time & Materials.

The first model is a traditional model of project development, when the client and the project manager define in the technical task the whole scope of work, agree a fixed budget and exact terms of project implementation. In Fixed Price (or FP) clients pay for the final result, and the executor pays for the time of their developers. In this case, if programmers spend more time for development and the budget does not change, the company's profit decreases. That's why a lot depends on the managers' ability to estimate the work effort in advance. Although risks and force majors may occur in any project.

The second model – Time & Materials (TM) – is the client's payment for the actual resources spent - developer's time.

The cash gap in the company may be formed for various reasons. Such as: losses due to low profitability of projects (which are not recorded at the project level properly), accumulated accounts receivable (in fact, it is a loan to a client), high level of OPEX, etc. Unfortunately, since the company has obtained a new legal status only in the third quartal of 2020 there are no proper financial data records for the previous activity (at the moment when this analysis has been performed). We have done our own research of the company activity and bellow (in the table 2.2) will present you

the approximate financial records report of the company's costs and revenue for the 2019, the first and the second part of the year.

Table 2.2

The financial records report of the company's costs and revenue for the 2019

Costs			
2019 (I)		2019 (II)	
Item	Score (\$)	Item	Score (\$)
Office cost	60 000	Office cost	90 000
Wage (35 employees)	300 000	Wage (50 employees)	390 000
Operational expenses	120 000	Operational expenses	150 000
TOTAL	480 000	TOTAL	630 000
Revenue			
2019 (I)		2019 (II)	
Period	Score (\$)	Period	Item
Jan – Jun	500 500	Jul – Dec	650 000
TOTAL	500 500	TOTAL	650 000

The GroupBWT though does not have a strong financial management – everything is being tracked by the cash-based method. Operational expenses such as: marketing, sales expenses, administrative and auxiliary personnel costs, taxes, administrative and management expenses, depreciation, interest on loans, etc., go together with the office costs and is deducted from income gained from projects pool.

Since we don't have any financial data of the GroupBWT in order to provide you with an example of one of the projects the company have been working with for two and a half years. This project is a good example of the management quality at the company. The project management team put a lot of customizations on the approach of managing this project including the finance. In general, the company uses either of the above-mentioned models of pricing (Fixed Price and Time & Materials), however, for the project X the pricing model has been changing quite several times during its existing.

Table 2.3

The profit of the project X in GroupBWT for the period Jan through Jun 2019

Period	Estimated (\$)	Spent (\$)	Variance (\$)
Jan	5 000	7 500	- 2 500
Feb	6 500	9 000	- 2 500
Mar	4 000	6 000	- 2 000
Apr	7 000	7 500	- 500
May	7 500	13 000	- 5 500
Jun	9 000	12 000	- 3 000
TOTAL	39 000	55 000	- 16 000

As we may observe from the data presented above this project is nonprofitable for the company. The table represents only the commercial data (cost) and show that the GroupBWT lost \$16 000 of the earned value it should have had.

Most of the projects at BWT have similar situation, however, yet in order to survive the crisis and heavy competition with other freelancers on the market – it was decided to continue the business relationships with these kind of clients as in most cases the revenue covers the OPEX expenses.

Now we will take a closer look at the company's organizational structure to see what it happening behind the scene.

2.2 Analysis of the GroupBWT's organizational management structure

In the chapter 2.2 we have briefly described the main key points of the org-structure of the company. We will dig deeper in the analysis of it and will identify what cause it has on the company.

As the investigated business – the GroupBWT – doesn't have the main document that would identify the organizational structure of the company, organizational chart, all the information provided below would be a representative

of the personal experience we've been able to obtain during our research at GroupBWT.

Business organized by departments that create and maintain specific function. We will look closer (the image 2.2) in how business decisions are made, how departments run within the company, how departments communicate with each other, determine how departments delegate responsibility.

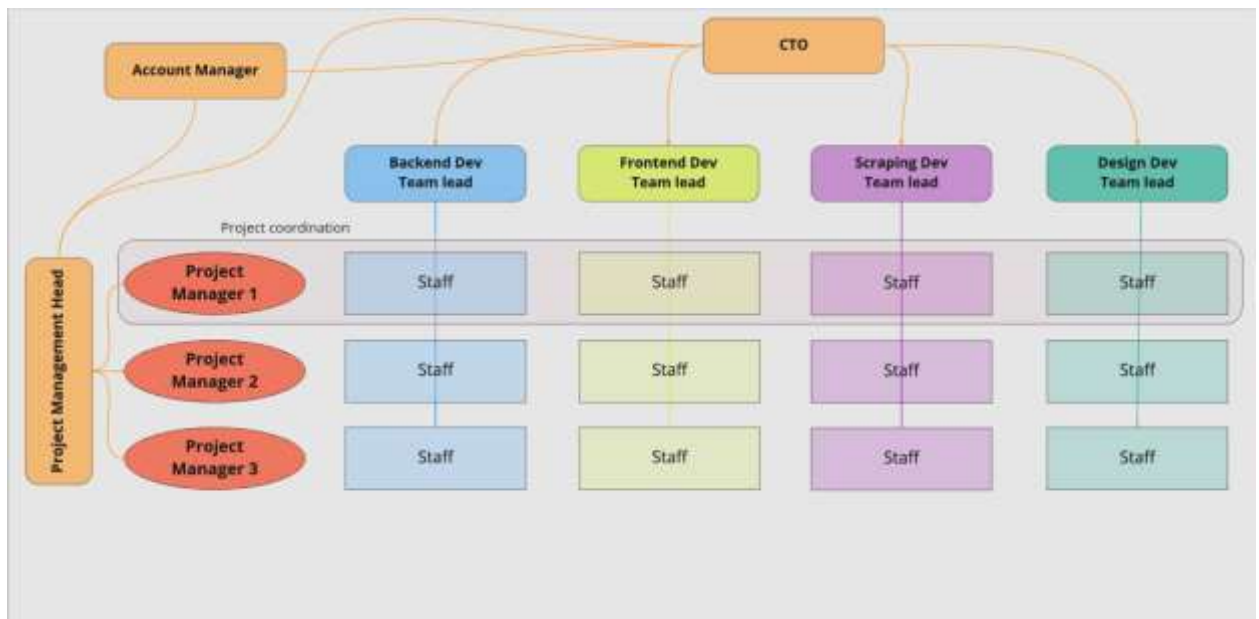


Image 2.2 The organizational structure of the GroupBWT (weak matrix)

The GroupBWT started its active growth relatively recently in 2019. As the company started its growth, the necessity of creating its own org-structure arisen which is why the 5 departments were created: Business Development, Marketing, Delivery, Project Management, Finance and Human Resource.

In the IT industry it is most likely to meet the strong matrix structure or project-based ones. At the moment the GroupBWT has a weak matrix structure. Due to the lack of skilled enough resources the management of the company had to come up with a custom solution creating a week matrix structure with some element related to the line org-structure. Often, in the companies with such structures, solution of actual problems of a department may lie beyond the authority of its head,

for example, there are stable problems with downtime or lack of people resources, you need to constantly pull out the team to assess incoming projects. Problems are solvable, but they create discomfort.

The weak matrix organizational structure is useful in small companies (20-30 employees) when skills need to be shared across departments to complete a task and can allow companies to utilize a wide range of talents and strengths. The project manager or its lead is usually the one in charge of the whole power and decision-making process withing the project.

However, at GroupBWT the problem solving is usually carried out on the department level. The reason for this approach being applied is that from the very emerging of the departments the management wasn't able to create the documentation provided with the relations between roles and departments. The business's organizational chart. This chart includes a description of all departments as well as the function of these departments. Organizational charts also include descriptions of all executive, managerial, supervisory, salaried and shift employee positions in the business. The absence of this document creates issues not only when it comes to problem solving but to running the whole business. With that being said, we concluded that the org-structure of the company has been created on the spot.

Now let's see the flow of the project appearing in the company. The main entry point for the company to obtain a new project is Upwork. The Upwork is an international market of remote work. Fully and only in English. On the Upwork people all over the world can find or provide their services: tasks that do not require a personal presence. Mostly on the Upwork the clients are from Europe, America whereas the residents of India, Ukraine, Russia, Poland, Bulgaria usually are service providers.

In our days, the GroupBWT has the sales sub-department that consists of 5 people: 2 sales managers and 3 leadgens. The Upwork has its own strict rules when it comes to leadgeneration, they even have a book guideline which will help anyone to understand how to work with the exchange. The leadgen position representative is a person who expresses interest in the product or service that a company offers to

potential customers. The leadgen team works 40 hours per week attracting new clients to the company – their main goal is to persuade the potential clients, by writing a good cover letter, to open a chat room or to hoop on the call where the client will be introduced to a salesperson. From this point, if a leadgen has managed to open a chat room, sales manager continues working with the client. The GroupBWT has its own statistics which shows the weekly analysis of the efficiency leadgeneration.

When the client is being introduced to the sales manager, they start a conversation regarding the task that needs to be performed – the project. It mainly has from 2 to 5 steps. Below we will present you the approximate steps that could be taken:

Introduction. On this step both parties would introduce each other. Also, a brief information regarding the requirements for the project could be presented along with the business idea of it; After a call, the client's side could gather all the data related to the project and create a document where it would state the first version of the requirement and send it over to the vendor's side (sales manager).

Discussing the requirements. As gathering the requirement could take a while for the client's side usually once the sale manager receives the requirements, he or she would look through them identifying the prime key points that are required in order to transfer the project to the development team for the quotation. After reading through the requirement sales manager would book a call with the representative of client's side in order to discuss the criteria and make sure that both parties have the same understanding of the project.

Estimating the approximate cost of the project. Once the sales manager makes sure that the requirements are matching the business need, the document is being transferred to the corresponding representative of the delivery department. This step could be reiterated for a couple of times depending on the complexity of the project and the questions and/or clarifications that might arise during the quotation process;

Discussing the quote identifying the questions that's appeared on the quotation step. This is a pre-last step which could be united with the previous one as

it covers the discussion of the scope described in the SOW document (statement of work)

Agreeing of the final SOW and the costs. Once all the details are being discovered and there is a clear requirement of the project. The sales manager puts it all together in one document called the Proposal (See the definition below) and approves it with the person who has committed the quotation. Within the GroupBWT the proposal is the document that states the key points of the project that is about to be performed. It contains: the cost, the approximate time needed to perform the project, the risks, and the brief of SOW. This document does not have any law power. The only confirmation that both parties would receive is only verbal and/or email acknowledgement. After that the final proposal is being sent to the client party and one receiving a confirmation that the project could be proceeded the sales manager notifies about the approved project the head of project management and delivery departments with a request for the development team and the project management.

Now, this is the stage at which the team and the project manager who will further carry out the project will be chosen. Unfortunately, the GroupBWT does not have any tracking system of the approach that would help to understand the employee availability. All the information related to the engagement of this or that person (will that be a project manager, or a developer) is carried out only by that particular person or the project management representatives. That is why, when it comes to the assignment of the incoming project to a project manager, it is performed perceptually («on the eye») by the head of the project management department.

On concur, in the delivery department, it works the other way which is barely could be considered a better one. To understand how the project is being assigned to the development team, let's take a closer look at the way the structure of delivery department is built.

As we have mentioned before at GroupBWT the delivery department consists of 5 sub-units: Frontend development, Backend development, Data mining, Design, Quality Assurance. Each of the units has its own Team Leader. This position is

occupied by a person who has been selected among those ones who expressed a desire to become one within a particular sub-unit, by the in-house voting. The team leader runs the sub-unit to which he or she has been assigned to. He or she provides guidance, instruction, direction and leadership to a group of individuals (the team) for the purpose of achieving a key result or group of aligned results.

Let's take a look into what is the backend and the frontend. For anyone who doesn't work directly with web development, concepts like frontend vs backend development can be challenging to wrap your head around. Pile on all of the frameworks, programming languages, APIs, and libraries that frontend developers use to build apps, and it can get very confusing. Two keywords to understand how websites work are the frontend and the backend. These are often considered separately and seen as two very different things, but they are both essential and closely connected in most web development projects.

The frontend, also called «client-side» programming, is what happens in the browser. It's everything the user sees and interacts with. The backend, also called «server-side» programming, happens on the server and the database. It's the machinery that works behind the scenes to power those fancy features users interact with on the client-side. Both play a crucial role in web development and although they have their fair share of differences, they are like two sides of the same coin. Frontend is all about the visual aspects of the website that a user can see and experience. On the contrary, everything that happens in the background can be attributed to the backend web development. It's more like an enabler for frontend web experience.

Frontend is also referred to as the «client-side» as opposed to the backend which is, as we have mentioned before – the «server-side» of the application. The essentials of backend web development within the GroupBWT include languages Python, PHP. The frontend languages are HTML, CSS, and JavaScript [32].

Now, what is the hold under the design in the IT sphere. There are two different types of the design in IT: UI and UX Design. The UX literally means «user experience». In a broader sense, it refers to all the experience that a user gets when

interacting with a website or an application. UX is an experience of working with the interface. User experience depends on various components: site architecture, graphic design, clear text and responsiveness of the interface to specific user actions. Since the user experience is abstract, the UX-designer need to study user's habits, develop prototypes of behavior and conduct testing. All this work is done by the UX-designer. UX design is responsible for the functions, adaptability of the product and what emotions it triggers from users. The clearer the interface, the easier it is for the user to get the result and perform the target action.

The UI (user interface) is the process of prototype visualization, which was developed based on user experience and target audience research. It is not necessary only graphic: tactile, voice or sound. We will only consider the graphical interface, since designers mostly work with it. UI design includes work on the graphical part of the interface: animations, illustrations, buttons, menus, sliders, photos and fonts. UI-designer determines the color palette and location of objects in the interface: whether it is convenient to click «Order», whether the drop-down menu works correctly, whether it is easy to fill out a form, whether the text is readable from a smartphone, what message the site produces in one or another action. In most of the projects the designs would be the first phase. The designers work output would be mockup of the application the team is about to build.

The Quality Assurance. QA is a critical part of every software development process. In its essence, QA in software development helps company to create products and services that meet the expectations and requirements of customers. It allows building high-quality product offerings that, in turn, improve loyalty and trust of consumers. By following the guidance defined by a QA after the tests, a team can prevent product defects before the project (product) has been given for a client's review. Quality assurance takes advantage of two key approaches: the defect management approach and the quality attributes approach.

In QA, a defect is any element of the software that's not in line with the client's requirements. Sometimes developers fail to understand such a requirement

fully, and that leads to design errors. Other sources of errors include poor data handling, buggy code, or improper functional logic.

The defect management approach comes in handy for tracking defects and defining categories to mark their severity. QA professionals can create control charts that measure the capabilities of the development team [29].

As we now have a clear understanding of what kind of work each sub-unit represent, we will study the management that is happening on the sub-unit level. The main member of the delivery department is the head of department – this position is also called CTO (Chief Technical Officer). Managing position, corresponds to the Russian «chief engineer». He or she is one of the corporation's managers, responsible for its development and new product development; CTO in the GroupBWT manages the entire technological part of production. However, it is also worth to mention that within this company, this position also covers responsibilities such as: headhunting, and partly distributing developers among the projects.

As well as in project management department, there is no documentation or system that tracks the proficiency level (skills set) and the engagement of each member to this or that project. Relatively recently the GroupBWT has implemented the new rule of managing people between the projects: when there is a request for a resource for the upcoming project, this information is being shared with the CTO who then transfers this info to the corresponding team leader.

The team leader, as there is no information about the occupancy of his or her sub-unit members (only an abstract information about free resources) goes to each project manager to see when this or that member would free up. Once/if there is an understanding of the available resources they would be pre-assigned to the upcoming project, though, this has to be approved with the CTO, project manager(s) (if the assigned resource is currently working on the other project), before the final agreement [4].

There is also the other flow for the resource assignment. This approach is still in place due to the fact that all team leaders are working on the active projects with planned 40 hours per week activity (basically they are leading one or a couple of

projects). Because of this the team leader most likely won't have free time for the team leader activities. In this case, the decision would be made directly by the CTO. On the first look, it doesn't seem to bring any issues, however, each department, and the company in general struggles for the setting up the information streams. When the CTO makes a decision, the part when he or she should also agree the decision made with other managing units often could be missed, which then creates issues for the management. Moreover, one developer could be included in the development of few projects at one time and as there is no tracking system, making a decision of resource assignment is time consuming.

One another problem that we have been able to identify that the lowest unit of the department – the developer – would have several supervisors at one time and would not have a transparency of the priorities between them. In most cases each representative of managing layer would give the developer priorities that could differ from the reality and/or the understanding of other managers. Picture this, when a developer works on the project, depending on its type, he or she would have at least two managers: project lead (the main developer on the project – is responsible for the technical part) and project manager. What if developer has two active projects.

In GroupBWT often happens that one developer could take several positions at one time on different projects. For example, developer has three projects: for the first one – provides a support; for the second – represents a project lead; and for the third one actively works as a developer. Each of these projects would have its own project manager and a team leader who do not have the communication processes set between them. Because of this the projects and the developers constantly suffering from the lack the quality of management at the company. With that being said, the resource management in the company could be considered as weak.

Coming back to the project flow withing the company: when the project team is set. The project management coordinates with the sales manager who has been working with the client on the first stages and obtains all the available data that relates to the project, creates all required corporate tools and prepares everything needed for the project with the help of team leader/project lead. Once everything is

ready the team starts working on the project. Depending on the type of the project there could be other related activities like daily standups, meetings on the request, etc. On this phase the project manager actively works both with the team on GroupBWT side and client one.

During progress of the project the team usually, depending on its complexity, goes through a couple of iterations, that look approximately like it is shown on the image 2.3 below.

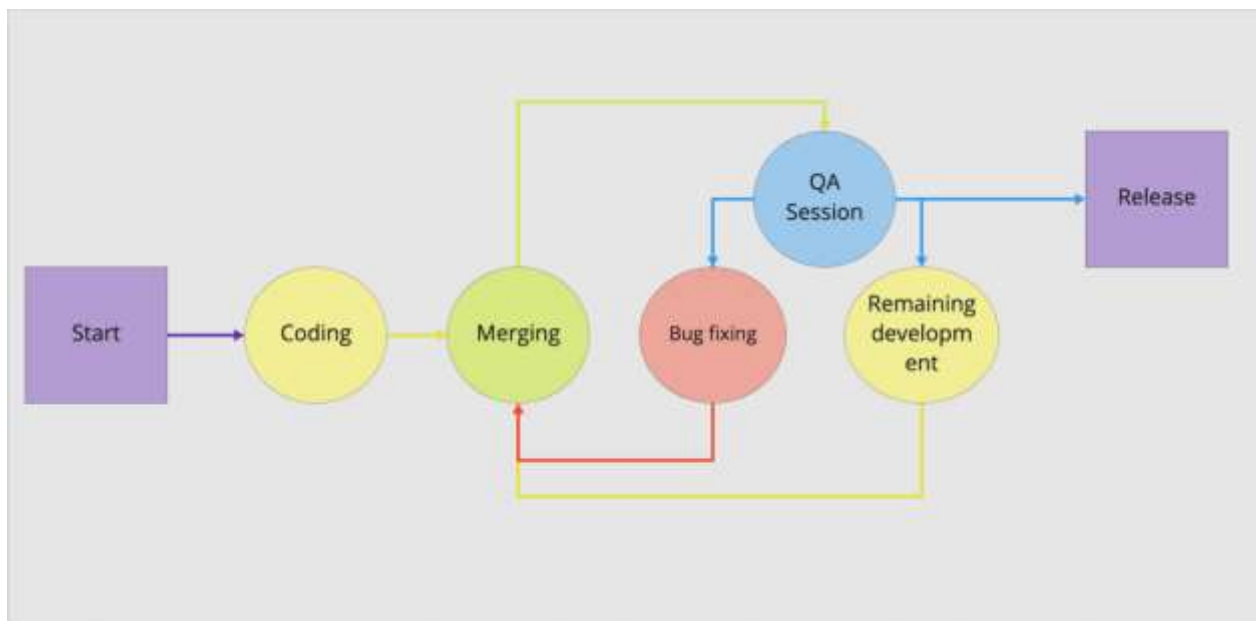


Image 2.3 The production cycle of an IT project

Once the QA engineer approves that the product matches the SLA or the requirements (SOW), the project manager sends the product to the customer for the review. If/when the client approves the project – the project is considered as finished and closed.

To conclude the above mentioned, the main problems of the organizational structure of the management in GroupBWT are the following: not effective flow for the decision making, the absence of information streams; no planning of the workload and as a result – overloaded employees.

2.3 The analysis of project management at the studied company GroupBWT

In this chapter we will consider the organizational structure at GroupBWT within the Project Management department. We will also highlight the processes of the project management that are performed by the manager during the lifetime of the project in the company.

Generally, the GroupBWT has a weak process set up: the company does not have is use any of the methods metrics and approaches for the project management – in most cases the project is carried out ad hoc. The other reason for that is lack of skilled project management representatives. Before we would start looking deeper, we will need to get an understanding of what are the approximate types of the project the company works with. Outsource project – this type of projects implies that the company takes the full responsibility for the project performance. It could be either the whole project from the scratch or a particular feature that the client is interested in. More information will be presented in the table 2.4 below. Out-staff project - this type of projects implies that the GroupBWT sells a service presented by a developer. Some of the clients are looking for the out-staff developer who will be functioning withing their company but legally will remain in the care of another company.

Each of these projects has its own advantages and disadvantages in terms of project management. We will fist analyze them considering each of the phase of the project's life.

Table 2.4

The outsourcing project

Phase	Description
Initiating	<p>For this type of projects the following is performed on the initiation phase: project creation, initial funding of the project, and authorization of the project manager plus the development team.</p> <p>Once the project manager coordinates with the sales manager who has brought this project to the company, he or she will identify all the available information related to the project. The next step would be Identifying the approximate plan that the team would follow to fulfill the project – this step is required in order for the project manager to be able to present that information to the client on the introduction call or in the email – to give an understanding that the project is already in progress. A good practice the GroupBWT considers to provide a client</p>

	<p>with this data so that he or she would not be unaware and could also do the planning. The information for the approximate plan is presented by the manager of the project and its lead. The project lead would identify how much of the effort needed for the project performance by splitting the development into logical pieces – only approximate at this phase. Together with project manager they would also go through the check list to identify if all the risks were identified in the proposal. After that, the project manager puts it all together and shares that data with the client. This phase is very important in terms of identifying the possible threads of the project and also making sure that nothing has been missed during the quotation of the project.</p> <p>At the same time the project manager prepares all the corporate tools required for the project initiation.</p> <p>Since the GroupBWT is a relatively small company some of the projects might just have one developer and one project manager which is why in most cases the management skips initiating phase or significantly reduces it.</p>
Planning	<p>At the planning phase of the outsourced project, the manager doesn't do much – most of the work relates to the project lead activities. The manager created a description of the business idea of the project in the corporate tool called Confluence (a replicable wiki system for internal use by organization to create a unified knowledge base – project documentation). The lead on the opposite, creates technical documentation for project. He or she (project lead) would split the work into smaller tasks (tickets). GroupBWT uses Jira as its corporate tool for task management.</p> <p>The project lead assigns each task to a particular team member coordinating with the project manager to make sure that everyone would have workload. At this stage the project development could be started.</p>
Execution	<p>At this phase the team starts working on the project. Depending on the complexity of the project the manager would set up the time ranges when he or she would need to coordinate with the lead and team (if needed). On the coordination meetings the project manager and the lead usually go through the check list of the points that are required for a manager to create a report for a client. At GroupBWT the main area of project manager responsibilities is the communication with the client which is why we believe this, and the following phase could be united as they represent mainly the same activity from the project manager.</p>
Monitoring & Control	<p>The monitoring and control embody the analytical job functions of the manager. The GroupBWT performs the quotation of any project on an hourly basis and then multiplies the number of hours to the hourly rate of the company. During the development each of the developers uses a corporate tool called Hubstaff to track the time he or she spent on a particular project (and a particular task). The project manager uses the statistics of the time that was spent to track the budget of the project. At this phase the manager is also able to track the progress on the project using the corporate tool, Jira – though it still does not provide enough transparency of the processes efficiency.</p>
Closing	<p>Closing phase requires the project manager to perform the final check of the project – which one would depend on the complexity of the project and the deliverables that we identified in the proposal. And then sent the final product to the client – usually by this time the client has already seen the project and pre-approved its completeness.</p>

For the out-staff project the project manager involvement is reduced to the minimum responsibilities. This type of project implies that all five phases initiating, planning, execution, monitoring & control, and closing, are performed either by the client him or herself and/or the representative of a management on client's side. The only activity that is performed always by the manager at GroupBWT is the finance. For billing the out-staff project in most cases both parties agree to use a neutral third party – the Upwork time tracker.

There is the other type of the projects at GroupBWT that could be considered as something in the middle between the first two ones – dedicated team. Dedicated team implies that the client's side already has a software development team, however, they don't have a particular language, a framework in their expertise, or the resources for performing a particular tasks therefore they would like to hire a team that would be self-functioning but will remain as a member of their software development department (they are able to consider the team for the workload planning if it was primary agreed with the GroupBWT management). This type of project could include the engagement of the project manager from GroupBWT or not. In case the client would like to hire a project manager from vendor's side the management of the project would be performed similarly to the outsourced one, if not – the out-staff one.

Having obtained the idea of what kind of projects the GroupBWT works with we are now able to start the analysis of the project management department.

As it was announced earlier the project management department collaborates with other departments on this or that level.

Let's start with the hierarchy of the department. The project management department at GroupBWT consists of 4 employees: the head of department and three project managers. The department coordinates on the daily basis by the means of daily meetings, regular verbal communication, and through the other corporate tools (Gmail, Slack, Jira, Confluence). The head of department obtains all necessary data at the daily meeting with the PM team. CTO and Account manager are also presented

(optionally) on those meetings. By the time of the daily meeting each of the project managers is expected to have collected up-to-date information of his or her projects.

The project management department has made up a custom solution to display all the project at once using the Jira board and cards (tickets). On the meeting all the participant would listen to the report of a particular manager asking the data they need to know about the projects. The highly important and impacting issues are often announced and solved here. These meeting are used as a tool of criticizing the performance of the projects and its manager as well. The duration of the meeting usually finds some middle ground between 30 minutes and 1 hour.

At the GroupBWT each project manager would have from 10 to 15 projects on the average which has a high negative impact of the productivity of employees of the department and the efficiency of the project deliverabilities as well.

Withing the company, the responsibilities of project manager role performer are pretty much vanished. The list would include pre-sale, documentation translation, finance management, human management, resource management, risks management, and others besides the project management, however, most of these activities are only shallow – when there is no authority of the project manager to be a decision maker. One of the main factors that lead to this type of management was insufficiency of qualified candidates for the project management role – most representatives do not have any of the management education and/or enough of commercial experience.

Because of the overload of the project managers, there is no activity of the department representatives, but managing their projects on a high level. The company doesn't have any standards and approaches for project managing and their regulations. Due to the factors mentioned above the department members could be hardly called a team. This creates quite a few issues when it comes to the resource sharing etc.

On the next step we will study the interaction of other departments with project managements one.

The BizDev and project management. The collaboration between these two departments is superficial. The sales manager interacts with the project manager only on the step when the proposal has already been signed off. As a result, in most cases, the project manager would then need to «fight» for the additional budget that has not been identified in the proposal, for instance: the proposal does not have a chapter where the risks were identified, or stated deliverable result is unrealistic. The company has made its internal research a result of which showed that the GroupBWT on the average can lose 10%-50% of the announced budget of a project.

The delivery and project management. We have already recognized a couple of issues that are impacting the quality of the final product from the delivery department side. Now let's see what impact those issues have on the project management unit. Just to refresh the agenda: the pain point was the inconsistency of the decision making, no informational streams, and overloaded people.

Recently the company has identified its main focused goals grow to 100 employees by the end of 2020 and increase the monthly income to 100 000 of dollars (sell projects to \$100 000/month). Due to this fact, the top management of the company has made a decision to never say no to the incoming projects, even in the company does not have any resources for that. This led to the appearance of not the best practices. One of them is that the people are overloaded. As we have mentioned, situations when one developer could be transferred to a various number of projects not within a week but within a day are not rare. This led to the quality decrease of the services provided by the company. When it comes to the project manager, each of them has 10 – 15 projects on the average which is why the activity of the project manager at GroupBWT is equal to a project coordinator rather than a manager (so called snowflake man). The department does not have any tools or approaches that could help managers to prioritize a developer's flow for a day especially if there are three different projects with three different managers.

The HR and project management. These two departments collaborate only regarding vacation and leaves of developers. This process just like the rest lacks the set up informational streams. The information between all (internal and external)

stakeholders is poorly transferred. There were cases when the project manager came to the office and couldn't find the developer because the developer approved sick leave with the head of project manager skipping his project manager; the head of the department approved the leave but forgot to tell that to CTO, HR, team lead, project lead and project manager. As a result, the business lost one day of development as the workload was preplanned for that developer.

The finance and project management. The project managers at GroupBWT do not have any information related to the finances of the company. Due to this reason a manager is only able to track the budget of the project based on the hourly rate of the company when it should be performed using internal costs and the incoming resources. With other departments the representatives of the project management are barely interacting.

As a conclusion we may state that the effectiveness of project management and other related processes is weak, and it is causing issues for the whole business itself. In the following chapters we will present the possible solutions for the company in forced to fix the vulnerabilities which will help the GroupBWT to implement the idea of fast-growing business with a high quality of the services.

CHAPTER 3

THE OUTPUT OF THE PERFORMED RESEARCH: RECOMMENDATIONS AND PROPOSITIONS TO THE MANAGEMENT STRUCTURE IMPROVEMENT AND PROJECT MANAGEMENT IN PARTICULAR FOR THE GROUPBWT

3.1 Improvements that should be applied to the organizational structure of GroupBWT

Using the investigation of the GroupBWT internal organizational structure we have performed and taking a closer look into the project management operations in particular, allows us now to make suggestions regarding necessary changes within the company so that it could reach its main goal at the moment – the growth.

In the second chapter we've been able to analyze the current organizational structure of management in GroupBWT which gave us a clue to the key pain points in it. We will propose the alternative ways to reorganize the structure of the company in the chapter 3.1. Furthering, in the chapter, we will identify the major challenges of project management at the company and the improvements needed to be implemented to increase the quality of the deliverable services.

Throughout our investigation presented at the chapters 2.1 and 2.2 we noted the following issues in the overall structure of the company: the current structure of management does not maintain proper dependencies between the individual units (departments) and the distribution of workload; the involvement of each of the departments at each stage of the project's life cycle in the company; the area of responsibility of a department as a whole and each role separately is blurred.

At the moment the GroupBWT has a weak matrix structure of management with the elements of line structure, however, the strong matrix and the project-based ones are considered as the best practices of running the organizational managing in the IT company. The main disadvantage that weak matrix structure brings to the

business a decrease of its flexibility. The GroupBWT is a growing business. Their philosophy states that you should never say «no» to the client, due to this at the moment the company is overwhelmed with the incoming projects. We should highlight here that it was not ready to this approach as it lacks resources. There are no processes set up to support more than approximately 20 small projects at the same time; no processes to manage more than 50 people on board. As a result, the new projects have been put inline and since the IT sphere is actively growing, for the incoming clients it was easier to find new provider who will deliver their project faster, so the company started to lose the clients it has already attracted (spent budget for the marketing campaign). The GroupBWT should have started active marketing campaign only after making sure that the inside processes are ready for the new load capacities.

We believe that at this stage the strong matrix structure would be the best solution for the company. This type of structure is useful when skills need to be shared across departments to complete a task and can allow companies to utilize a wide range of talents and strengths.

There are three types of matrix structure:

Weak matrix organization: This type of matrix organizational structure is most similar to a traditional workplace hierarchy. A functional manager oversees all aspects of a project and acts as the primary source of decision making. While there is a project manager who also acts as a point of authority, they ultimately answer to the functional manager.

Balanced matrix organization: In this type of matrix organizational structure, more authority is given to the project manager. While there is still a functional manager who is the primary authority, employees also report to the project manager.

Strong matrix organization: A strong matrix organization provides the project manager with equal or more power than the functional manager (team lead and/or project lead). The project manager has primary control over resources and distribution of tasks.

Along three types of matrix structures (weak, balanced, and strong) the strong matrix organization is what GroupBWT should be heading to. The easiest way to rebuild the current (weak matrix) structure is to transform it into the strong matrix one.

There are several benefits of implementing a matrix organizational structure within the workplace. These benefits include:

Increased communication efficiency. A matrix organizational structure allows multiple departments to easily communicate and collaborate on a project. Because employees report to multiple managers (that would be clearly specified before the start of the project), as opposed to various stakeholders, issues are resolved more quickly, and company-wide interaction is improved.

Improved employee motivation. In a matrix organizational structure, employees have much more autonomy and input in projects. This type of structure encourages employee contribution and places a higher value on workers' point of view. Matrix organization, employees work across multiple projects and with various departments within the company. This increases employee interaction and promotes a better sense of teamwork

Maximizes resource usage. This type of structure would allow the GroupBWT resources to be maximized because of how equipment and employees are shared across projects. A matrix structure also would allow project managers to work in the areas of their expertise rather than being pulled across multiple projects, boosting the overall contribution of their talents.

Increased employee professional development. A matrix structure will provide employees with work across a wide variety of projects and require them to utilize and/or learn different skills. Being exposed to various job duties and responsibilities can increase employee development and enhance their professional skills. Nevertheless, it will also give the company the way to manage cross functional teams – which will enable the management to reach the maximum efficiency of the resources use [12].

The strong matrix organizational structure will help the GroupBWT to overcome the disadvantages of the weak one. The disadvantages can be countered in the following ways: There will be close cooperation between the project manager and the functional manager to avoid confusion and conflict. Communication will be well defined and occur in all directions. This is important to gain support from executives, managers, supervisors, and employees. The strong matrix organization would also force business to communicate their vision, objectives, and goals with their employees [35].

Since strong matrix structure implies that a project manager is the one who is responsible for the distribution of the resources between the projects, it will help the company to set up proper informational streams across the departments. In the strong matrix structure roles and responsibilities should be clear and communicated to employees to avoid confusion. See the example of a strong matrix organizational management structure on the image 3.1 below.

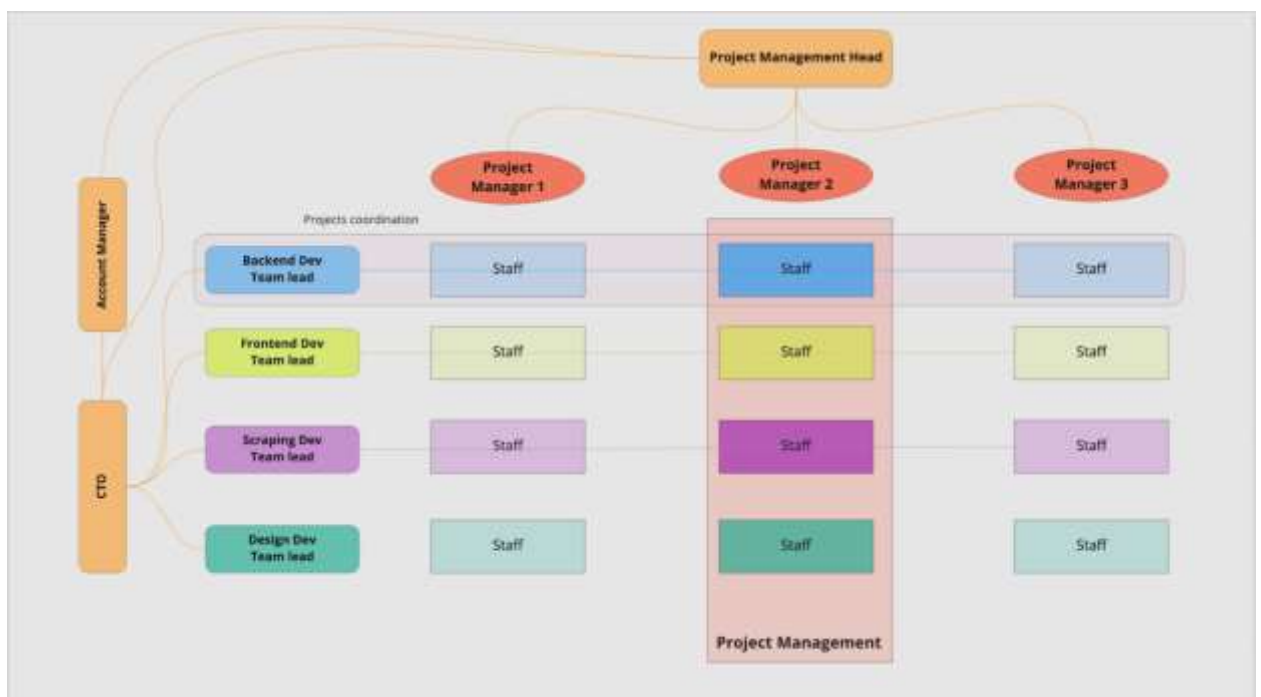


Image 3.1 The strong matrix organizational structure

With the above mentioned, we would like to strongly suggest to the GroupBWT management before applying any changes to the structure first to create a document where would be specified the relations within each department (and between the departments), the role representatives' area of responsibilities, required skills of the role representative, the workload of each role, etc. Every process, and how it is performed; who are the people you may ask for a help. Setting up such document will help the current employees and the fresh one to easily infiltrate themselves with the new changes applied. This will also reduce the level of uncertainty for the developers in particular, as the document would also specify who is responsible for setting the priorities for a day/week.

As we have mentioned before the strong matrix organizational structure implies that the project manager would be the main authority within the project. Hence, the next step before applying the new organizational structure would be to rearrange the project management department. Unfortunately, at the moment the project management department has weak performers of the role, which is why we believe the company management would have to make either one of two possible decisions.

The first solution would be to replace the current members of the department with strong project managers. In order to carry out a strong matrix structure the project management department should be one of the strongest departments within the company. Now let's identify what skill set should have a strong project manager representative.

We may highlight such primary components of the role of PM:

1. The basics of architecture and Release management.
3. Planning.
4. Communication.
5. People Management.
6. Mastery of tools.
7. Management of requirements and documentation.
8. Budget management.

Table 3.1

The primary components of the role of Project Manger

Quality	Description
The basics of architecture and Release management.	Implementation of Continuous Delivery practices. Real-time process monitoring: Configuration of automatic notifications of analytics by selected metrics.
Planning.	Management of the planning process; The ability to take on the role of Scrum Master (often a combination of this and PM roles); Work with aesthetes, simultaneous work at several planning levels (high, story level, technical level); Building Gantt charts for the client; Competent planning of releases and planning iterations. Knowing the PMBOK concepts, their differences from Agile methodologies.
Communication.	English: fluent (C1, C2); Work with stakeholders (project stakeholders); Participation in presale; Delivery management; Project management from the moment the SOW is committed (until release, possibly excluding budget management); Project risk management and competent risk communication to the client; Communication in the team.
People Management.	Communication of progress to the client and requirements to the team; Ability to work with conflicts in a team; Managing risks in a team; Carrying out one to one meeting; KPI implementation, performance evaluation; Management of cross-project/shared/remote commands; Conducting interviews.
Mastery of tools.	Jira advanced level, Confluence, prototyping tools (Balsamiq Mockups, Proto.io, Axure etc., if necessary), MS Project or similar; Atlassian Portfolio, BI/process analytics systems (ServiceClarity & others).
Management of requirements and documentation.	Create and use a structure that is identical for all projects and can be copied from project to project.
Budget management.	Project evaluation and data communication to the client; Time tracking analysis; Budget communication/budget management – according to the company policy; Reporting.

Creating a strong project management team would help the company to prosper by delivering a high quality of services and products. The second solution would be to stick with the team that the company already has but fulfill it with

additional resources. It is considered as a good practice along the HR management to have a proportion of highly skilled professionals and junior & middle level ones. This would help a company to create a competitive environment in the team. Once the document that describes the new organizational structure and the skilled project managers would be set, the company would be ready to start the reorganization. We believe that applying the described above changes will create a proper structure of the company that will increase its profitability.

3.2 Improving the practices of Project Management performance within the company

This work overall was been created with the one purpose to identify its main weak spots of the GroupBWT and to suggest to the management of the company possible solutions. As it is read through the work, the main pain point of the company is the project management performance. In this chapter we will offer the improvement needed to be applied to the process of carrying out the project in order to increase the quality of the final result – the product.

Having analyzed the project management processes within the company we would like to suggest introducing the new approach for running the project to GroupBWT. The following in particular:

1. Introduce the wider documentation that should be created on different stages of the project;
2. Implement methodologies and approaches of the project management that will match the policy of the company;
3. Improve the collaboration of project management department with the rest of company's units.

Introducing wider documentation of the project.

First thing that should be improved withing the company is the documentation. Setting up a secure-documents and their flow will help the company to decrease the level of uncertainty and unpaid work.

The project documentation is usually created at the first two stages of the project life cycle: initiation and planning. At the GroupBWT initiation of the project does not require any of moves from a project manager. The resources, budget, and scope are already pre-set for the project by the members of other department (delivery and BizDev). Most of the IT businesses, on concur, have their project managers with a deeper penetration to the processes at the initiation stage. We believe the same approach should be applied for the GroupBWT as well.

The project manager is able to identify peculiarities and risks that might be missed by the BizDev representatives when creating the final proposal (the only document that the vendor and the client have before starting a new project). This is why having just one proposal as the main document is harmful for both the GroupBWT and a client. We suggest that the proposal should be used only as the approximate plan for the project performing in order to provide a potential client with the heads-up of what the project budget might look like.

Project planning is at the heart of the project life cycle and tells everyone involved where you're going and how you're going to get there. The planning phase is when the project plans are documented, the project deliverables and requirements are defined, and the project schedule is created. It involves creating a set of plans to help manager to guide team through the implementation and closure phases of the project. The plans created during this phase will help managing time, cost, quality, changes, risk, and related issues. They will also help manager control staff and external suppliers to ensure that the team will be able to deliver the project on time, within budget, and within schedule.

The project planning phase is often the most challenging phase for a project manager, as you need to make an educated guess about the staff, resources, needed to complete the project. We will list all the basic activities related to this phase of the project in the table 3.2 below. Manager will also need to plan communications and procurement activities, as well as contract any third-party suppliers.

The purpose of the project planning phase is to:

1. Establish business requirements

2. Establish cost, schedule, list of deliverables, and delivery dates
3. Establish resources plans
4. Obtain management approval and proceed to the next phase

Table 3.2

The basic activities of project planning

#	Activity	Description
1	Scope planning	specifying the in-scope requirements for the project to facilitate creating the work breakdown structure
2	Preparation of the work breakdown structure	spelling out the breakdown of the project into tasks and sub-tasks
3	Project schedule development	listing the entire schedule of the activities and detailing their sequence of implementation
4	Resource planning	indicating who will do what work, at which time, and if any special skills are needed to accomplish the project tasks
5	Budget planning	specifying the budgeted cost to be incurred at the completion of the project
6	Risk management	planning for possible risks and considering optional contingency plans and mitigation strategies
7	Quality planning	assessing quality criteria to be used for the project
8	Communication planning	designing the communication strategy with all project stakeholders

The projects processing at the company is always in rush: not time for the documentation, no time for considering the right candidates for project performance, no timeline planning, scheduling, etc. These points are the weak spots of project start which then suspend its management.

The solution for that would be rearranging the organizational structure of the company which we have described in the previous chapter and normalizing the load of the project management representatives.

Notwithstanding the great positive impact that the creation of such documentation would have, all the document should consider the peculiarities of the projects the GroupBWT works with. The company mainly operates with small project that least around 2-3 months with the team of 1-5 developers. In an hourly range it's around 50h to 250h. This type of projects usually does not require detailed documentation and/or all the activities listed above.

The project management will be not profitable for the company in its current conditions if any project would have to have all the listed activities performed. Since the quotation of the project is done on the hourly basis, we would offer to categorize the projects in the following way to understand the required documentation of any project.

Table 3.3

Categories of the projects and corresponding project management activities

Quoted hours	Project Manager activities
0h – 100h	Scope planning, Resource planning, Budget planning, Risk management, Communication planning.
101h – 250h	Scope planning, Resource planning, Budget planning, Risk management, Quality planning, (if needed Project schedule development), Communication planning.
251h – 399h	Scope planning, (if needed Preparation of the work breakdown structure), Project schedule development, Resource planning, Budget planning, Risk management, Quality planning, Communication planning.
400h +	Scope planning, Preparation of the work breakdown structure, Project schedule development, Resource planning, Budget planning, Risk management, Quality planning, Communication planning.

The planning phase refines the project's objectives, which were gathered during the initiation phase. It includes planning the steps necessary to meet those objectives by further identifying the specific activities and resources required to complete the project. Now that these objectives have been recognized, they must be clearly articulated, detailing an in-depth scrutiny of each recognized objective. This articulation serves as the basis for the development of requirements. What this means is that after an objective has been clearly articulated, the project manager can describe it in concrete (measurable) terms and identify what the team have to do to achieve it. Obviously, if a poor job of articulating the objective has been accomplished at this stage of the project, the requirements will be misdirected and the resulting project will not represent the true need of a client.

In 2020, most of the IT companies in Ukraine and other countries began actively using the SMART rule when articulating the project objectives. This implies the rules presented in the table 3.4 [1].

Table 3.4

SMART rule

Characteristic	Statement
Specific	get into the details. Objectives should be specific and written in clear, concise, and under-standable terms.
Measurable	use quantitative language. You need to know when you have successfully completed the task.
Acceptable	agreed with the stakeholders.
Realistic	in terms of achievement. Objectives that are impossible to accomplish are not realistic and not attainable. Objectives must be centered in reality.
Time based	deadlines not durations. Objectives should have a time frame with an end date assigned to them.

Following these principles, helps project manager to make sure that the objectives meet the quantifiable criteria needed to measure success.

The main document that should be always created at the planning stage is the «Scope of Work» (SOW) is typically a written document that defines what work will be accomplished by the end of the project — the deliverables of the project. The project scope defines what will be done, and the project execution plan defines how the work will be accomplished. No template works for all projects. Some projects have a very detailed scope of work, and some have a short summary document. The quality of the scope is measured by the ability of the project manager and project stakeholders to develop and maintain a common understanding of what products or services the project will deliver. The size and detail of the project scope is related to the complexity profile of the project. A more complex project often requires a more detailed and comprehensive scope document.

According to the PMI, the scope statement should include the following:

1. Description of the scope
2. Product acceptance criteria
3. Project deliverables
4. Project exclusions
5. Project constraints
6. Project assumptions

The scope document is the basis for agreement by all parties. A clear project scope document is also critical to managing change on a project. Since the project scope reflects what work will be accomplished on the project, any change in expectations that is not captured and documented creates the opportunity for confusion.

One of the most common trends on projects is the incremental expansion in the project scope. This trend is labeled «scope creep». Scope creep threatens the success of a project because the small increases in scope require additional resources that were not in the plan. Increasing the scope of the project is a common occurrence, and adjustments are made to the project budget and schedule to account for these changes. Scope creep occurs when these changes are not recognized or not managed.

The ability of a project manager to identify potential changes is often related to the quality of the scope documents.

One another good practice to have for the project documentation is a list of stakeholders this is included in communication planning activity. The project manager creates a list analyzing all key figures who may be interested in the project to:

1. Understand their needs;
2. Determine what is expected from reporting and performance;
3. Find out what the questions and challenges are;
4. Identify preferred communication processes;
5. Reduce potential conflicts;
6. Develop a collaborative spirit.

Both of these documents are important at the project planning stage, for the project manager to be able to analyze and discuss the project with stakeholders. The project manager must develop alignment among the major stakeholders—those who have a share or interest—on the project during the early phases or definition phases of the project. The project manager will conduct one or more kickoff meetings or alignment sessions to bring the various parties of the project together and begin the project team building required to operate efficiently during the project.

The next step of improving the quality of the project management is the budget management. The definition of project success often includes completing the project within budget. Developing and controlling a project budget that will accomplish the project objectives is a critical project management skill. Although clients expect the project to be executed efficiently, cost pressures vary on projects.

The accuracy of the project budget is related to the amount of information known by the project team. In the early stages of the project, the amount of information needed to develop a detailed budget is often missing. To address the lack of information, the project team develops different levels of project budget estimates. The conceptual estimate (or «ballpark estimate») is developed with the least amount of knowledge and. This quotation provided to a potential client in the

proposal. The major input into the conceptual estimate is expert knowledge or past experience. A project manager who has executed a similar project in the past can use those costs to estimate the costs of the current project.

Overall, in order to provide a good cost management the project manager should consider the following points:

Determination of resource cost rates: People who will be working on the project all work at a specific rate. Any additional expenses such as third party service providers (for example the server hosting, proxies, etc.) that are used to build the project will be charged at a rate too. Determining resource costs implies figuring out what the rate for labour and additional expenses needed to perform the project.

Reserve analysis: the project manager needs to book some money for cost overruns. So that when one of a potential risk of the project it will have some budget available to deal with it. Usually the project manager includes this information in the package of project's documents in the list of risks.

Cost of quality: the project team identifies the approximate cost of all quality-related activities into the overall budget. Since it's cheaper to find bugs earlier in the project than later, there are always quality costs associated with everything the project produces. Cost of quality is just a way of tracking the cost of those activities.

The project manager is responsible for tracking costs against the budget and conducting an analysis when project costs deviate significantly from the project estimate. The project manager then takes appropriate corrective action to ensure that project performance matches the revised project plan. In most of the IT companies the main tool of managing the budget of the project is resources costs (developers of different level of skills and years of commercial experience).

Once applying all the points in this process, the project manager will arrive at an estimate for how much the project will cost. It's important to keep all of supporting estimate information. That way, when the team were coming up with the numbers the project manager will know key criteria of the final estimate.

In GroupBWT this information is not available for the project management representatives which is why he or she is not able to perform the cost management

on the project. In order to fix the lack of cost management performance the project team should be the one who will carry out and present to a client the final cost of the project, only after the initiation and project planning stages will be done [3].

Implementing the use of methodologies and approaches for the project management that will match the policy of the company.

In our days most of the IT companies use agile approaches for the project management. The Agile Method and methodology are a particular approach to project management that is utilized in software development. This method assists teams in responding to the unpredictability of constructing software. It uses incremental, iterative work sequences that are commonly known as sprints. The GroupBWT approach for the project management more likely can be related to the waterfall rather than agile, however, some of flexible characteristics are still presented. As it was mentioned before, the company has a weak project management representatives and chaotic organizational structure, due to this the management had to come up with a custom solution that would fit into the environment of the company. Considering the results of our investigation we may conclude that with the growth of the company the current method is no longer valuable and loss-making for the GroupBWT. We believe that applying the world-widely used approaches of agile methodology now becomes a «must-have» for the teams and the project performing within GroupBWT. Below you will find the list of Agile methodologies:

1. Agile Scrum Methodology
2. Lean Software Development
3. Kanban
4. Extreme Programming (XP)
5. Crystal
6. Dynamic Systems Development Method (DSDM)
7. Feature Driven Development (FDD)

Scrum and Kanban ones are the most popular methodologies used along IT businesses. Let's consider the peculiarities of both of them.

A Scrum process is distinguished from other agile processes by specific concepts and practices, divided into the three categories of Roles, Artifacts, and Time Boxes. These and other terms used in Scrum are defined below. Scrum is most often used to manage complex software and product development, using iterative and incremental practices. Scrum significantly increases productivity and reduces time to benefits relative to classic «waterfall» processes. Scrum processes enable organizations to adjust smoothly to rapidly changing requirements and produce a product that meets evolving business goals. An agile Scrum process benefits the organization by helping it to Increase the quality of the deliverables; Cope better with change (and expect the changes); Provide better estimates while spending less time creating them; Be more in control of the project schedule and state [38].

Scrum does not define just what form requirements are to take, but simply says that they are gathered into the Product Backlog and referred to generically as «Product Backlog Items», or «PBIs» for short. Given the time-boxed nature of a Sprint, we can also infer that each set should require significantly less time to implement than the duration of the Sprint. Most Scrum projects borrow the «XP» (Extreme Programming) practice of describing a feature request as a «User Story», although a minority uses the older concept of a «Use Case». We will go with the majority view here and describe three reasonably-standard requirements artifacts found in Product Backlogs.

A User Story describes a desired feature (functional requirement) in narrative form. User Stories are usually written by the Product Owner and are the Product Owner's responsibility. The format is not standardized, but typically has a name, some descriptive text, references to external documents (such as screen shots), and information about how the implementation will be tested. A typical user story would consist of the following details: name, description, screens and External documents, and how to test the functionality that would be developed within a particular user story. There are two reasons for including the information about how to test the Story. The obvious reason is to guide development of test cases (acceptance tests) for the Story. The less obvious, but important, reason, is that the Team will need this

information in order to estimate how much work is required to implement the story (since test design and execution is part of the total work).

Not all requirements for new development represent user-facing features, but do represent significant work that must be done. These requirements often, but not always, represent work that must be done to support user-facing features. These non-functional requirements are called «Technical Stories». Technical Stories have the same elements as User Stories, but need not be cast into narrative form if there is no benefit in doing so. Technical Stories are usually written by Team members, and are added to the Product Backlog. The Product Owner must be familiar with these Stories, and understand the dependencies between these and User Stories in order to rank (sequence) all Stories for implementation.

The other type of work is defects. A Defect, or bug report, is a description of a failure of the product to behave in the expected fashion. Defects are stored in a bug-tracking system, which may or may not be physically the same system used to store the Product Backlog. If not, then someone (usually the Product Owner) must enter each Defect into the Product Backlog, for sequencing and scheduling.

Scrum methodology has several roles of stakeholders: customer, vendor, development team, ScrumMaster, product owner, and tom management representatives (Project managers and C-Level executives).

The ScrumMaster is a person that is responsible for making the process run smoothly, for removing obstacles that impact productivity, and for organizing and facilitating the critical meetings. In practical terms, the ScrumMaster needs to understand Scrum well enough to train and mentor the other roles and educate and assist other stakeholders who are involved in the process. The ScrumMaster should maintain a constant awareness of the status of the project (its progress to date) relative to the expected progress, investigate and facilitate resolution of any roadblocks that hold back progress, and generally be flexible enough to identify and deal with any issues that arise, in any way that is required.

The product owner role is taken by the keeper of the requirements. The Product Owner provides the «single source of truth» for the Team regarding

requirements and their planned order of implementation. In practice, the Product Owner is the interface between the business, the customers, and their product related needs on one side, and the Team on the other. The Product Owner buffers the Team from feature and bug-fix requests that come from many sources and is the single point of contact for all questions about product requirements. Product Owner works closely with the team to define the user-facing and technical requirements, to document the requirements as needed, and to determine the order of their implementation. Product Owner maintains the Product Backlog (which is the repository for all of this information), keeping it up to date and at the level of detail and quality the Team requires. The Product Owner also sets the schedule for releasing completed work to customers and makes the final call as to whether implementations have the features and quality required for release. The Team is a self-organizing and cross-functional group of people who do the hands-on work of developing and testing the product. Since the Team is responsible for producing the product, it must also have the authority to make decisions about how to perform the work. The Team is therefore self-organizing: Team members decide how to break work into tasks, and how to allocate tasks to individuals, throughout the Sprint. The Team size should be kept in the range from five to nine people, if possible. (A larger number make communication difficult, while a smaller number leads to low productivity and fragility.) Note: A very similar term, «Scrum Team», refers to the Team plus the ScrumMaster and Product Owner.

The benefits of using scrum approach are the following:

1. Customers find that the vendor is more responsive to development requests. High-value features are developed and delivered more quickly with short cycles, than with the longer cycles favored by classic «waterfall» processes.
2. Vendors reduce wastage by focusing development effort on high-value features, and reduce time-to-market relative to waterfall processes due to decreased overhead and increased efficiency. Improved customer satisfaction translates to better customer retention and more positive customer references.

3. Team members enjoy development work, and like to see their work used and valued. Scrum benefits Team members by reducing non-productive work (e.g., writing specifications or other artifacts that no one uses), and giving them more time to do the work they enjoy. Team members also know their work is valued, because requirements are chosen to maximize value to customers.

4. Project Managers (and others) who fill the ScrumMaster role find that planning and tracking are easier and more concrete, compared to waterfall processes. The focus on task-level tracking, the use of Burndown Charts to display daily progress, and the Daily Scrum meetings, all together give the Project Manager tremendous awareness about the state of the project at all times. This awareness is key to monitoring the project, and to catching and addressing issues quickly.

5. Scrum provides high visibility into the state of a development project, on a daily basis. External stakeholders, such as C-Level executives and personnel in the Project Management Office, can use this visibility to plan more effectively, and adjust their strategies based on more hard information and less speculation.

Having studied the overall experiences along IT companies that are using scrum methodology, we are strongly convinced that wise implementation of this approach into the GroupBWT project management practices will help to improve the quality of project management performance within the company [30].

Another approach along the existing agile practices that would worth company's attention is Kanban. Generally, the GroupBWT is already using Kanban, however, we would like offer implementing a few improvements into existing approach.

Kanban is a simple lean «best practice» method, that focuses on creating a continuous workflow - and ongoing added value for the customer. On the other hand, it is not fair to call Kanban methodology, because it doesn't imply that we take the project from scratch and lead it to the end, and there are no words about documentation or meetings. Kanban is a tool that helps to smooth out bumps and clearly shows where to improve current processes. Its aim is to visualize and improve any software development process. The end result is a development pipeline, that is

predictably and efficiently delivering high value work. Kanban approach has a few basic principles, that should be followed in order to achieve an improvement in a software development team's performance:

The first one is Workflow illustration. Visualization gives one a shared overview of one's process, and thus helps to identify and resolve any workflow problems. Moreover, it simplifies collaboration between people and across different project teams. A common practice for that, is to have a board, on which specific work phases are visualized. The simplest Kanban board for software development team consists of 3 columns: Backlog, In Progress and Done.

The second principle is Limit WIP (Work In Progress). This is perhaps the principle most closely identified with Kanban. The idea of WIP limits is to try ensuring that one never start or complete a task, that cannot be passed smoothly onto the next stage, without blocking up the entire workflow. The project manager is able to limit the amount of work in progress per stage, person or work item type.

In 2020 and fast changing conditions, the iterative approaches are the key factor in many businesses including the IT companies. The GroupBWT should apply an iterative methodology in production, and to track the operational situation inside the sprint (one iteration) through Kanban board. Standardizing the characteristics of the board will help the company with the management of the small projects as well as with those where the scrum couldn't be applied.

Since the Kanban board has been designed to display the current status of the task and our main goal is to improve the engagement of project manager into the process we believe the following standards should be applied for the board management:

Table 3.5

Regular Kanban board management

Status (column)	Meaning	Processes
To do	sprint backlog	Here the project lead splits the planned for development feature into the task (and epics if needed).

In progress	tasks that are being developed at the moment	When starting, the developer drags the task from «To do» to «In progress». At one moment he/she has only one task, as the parallel execution of tasks does not end well.
Ready for deployment	tasks that have already been completed, but are not presented in the test environment	After finishing his/her part of the work, the developer drags it to the «Ready for deployment» column.
QA	tasks which are ready for testing	From now on, the Quality Assurance Department will take over the case. After reaching the limit of tasks in this column QA engineer initiates the build, or server, etc. Ideally it is good to have a continuous integration tool such as Jenkins for this purpose. It is also acceptable to simply ask a developer to build a build or upgrade a server.
PO/PM approving	ready tasks are tested by the project owner or project manager	If the test results are successful, the task is sent to the «PO/PM» column, where it receives confirmation.
Done	completed (completed) tasks of the current sprint	Once the task has been approved is dragged to the last «Done» column. If the task does not pass the test, it gets back to the «To do» column with the corresponding comment. Bug-report has exactly the same lifecycle.

To build such a process, it is necessary that all team members have correct notification settings. In this case it is possible to avoid idle time when tasks are transferred between performers. It is also likely to perform intermediate code deliveries to the Ready for deployment column, as this will provide more rapid feedback. A bunch of tasks in any of the columns is called «bottle neck». This means that there is not enough bandwidth at this section and project manager has to find the reason and solve it. For quick QA feedback the engineer must be able to test individual components: Database, API, front-end, back-end.

There are a couple of reasons why the GroupBWT should keep the Kanban practice but with a couple of improvements. With such a tool the company has a well-coordinated work, where everyone knows their location on a common map. It offers all the advantages of Kanban, among which these should be noted:

- Reduced time of passage of each specific task and, as a result, the whole project;
- Fast feedback from the Quality Assurance Department;

- Early involvement of QA engineers and, as a result, no headache before the release;
- High involvement of the team in the development process;
- Execution of the project on time by reducing downtime and automating integration;
- High quality of the product.

To conclude everything that we have described above we would like to highlight one more time the efficiency that the GroupBWT will be able to achieve by applying the practices and methodologies that are described in this chapter. For the successful performance of the small-growing business in the IT sphere in Ukraine it is very important to create and set up the organizational structure of the management along with the best matching project management practices that would provide the company with the needed level of flexibility and the transparency of the processes within the company.

CONCLUSION

In this work we have performed the examination of the small IT businesses in Ukraine that are trying to get on the way of the business growth. We have investigated the issues that are faced by these companies on the object of the research LLC «GroupBWT». Through this research we have been able to identify the following data on the investigated topic.

We have investigated the concept of project management in IT halls. The research showed that the Ukrainian IT market in the 21st century has a great tempts of growth. It attracts more and more investments from the abroad countries and already has strong relationships with the US and Europe countries.

The review of the formulation of project management as a self-sufficient discipline and IT-industry in Ukraine helped us to oversee the main peculiarities of the project management specifically in the IT industry. We have been able to analyze the basic concepts of the project management that have already been identified in the recognized world institution specializing in project management (PMI) and identified in the guide of the Project Management Body Of Knowledge (PMBOK).

The researched the theoretical foundations of the concept of project management helped us to present for your attention the best project management practices that are already applied in the Ukrainian IT companies.

Analysing the performance of the investigated company LLC «GroupBWT» in depth the obtained observation on the investigated topic. The «GroupBWT» is the representative of one the average small IT company in Ukraine.

Examining the general characteristics of the LLC «GroupBWT» company allowed us to recognize the core issue that is faced by the growing small IT businesses in Ukraine – the weak organizational structure of the company management. Which is why it was decided thoroughly to analyze the organizational structure of the management of the «GroupBWT».

The analysis of the project management of the LLC «GroupBWT» created a strong confidence in the fact that the project management performed in many small IT companies can be considered as one of the main weak spots of the business as the main product of any IT company is the project.

The last but that the least we have been able to provide the output of the performed research: the recommendations and the propositions to the management structure improvement and project management in particular for the investigated company, LLC «GroupBWT». We have developed and presented the plan of improvements that should be applied to the organizational structure of GroupBWT in order for the company to be able to reach its best performance level and to start actively increasing its powers on the path of business growth. We have also created and provided the strategy of improving the practices of Project Management performance within the company. Which would help the management of the company to improve the efficiency of its project management resources as well as to increase the quality of the final deliverable – the project.

«REFERENCES»

1. Barron M. Overview of Project Planning [Электронный ресурс] / М. Barron, А. Barron – Режим доступа до ресурсу: <https://opentextbc.ca/projectmanagement/chapter/chapter-8-overview-of-project-planning-project-management/>
2. Vocean C. PROJECT BASED ORGANIZATION - AN INTEGRATED APPROACH [Электронный ресурс] / Claudiu Vocean. – 2011. – Режим доступа до ресурсу: https://www.researchgate.net/publication/227367695_PROJECT_BASED_ORGANIZATION_-_AN_INTEGRATED_APPROACH
3. Darnall R. Framework for Project Management [Электронный ресурс] / R. Darnall, E. Michigan, J. Preston – Режим доступа до ресурсу: <https://opentextbc.ca/projectmanagement/chapter/chapter-4-framework-for-project-management-project-management/>
4. Darnall R. Framework for Project Management [Электронный ресурс] / R. Darnall, J. Preston – Режим доступа до ресурсу: <https://opentextbc.ca/projectmanagement/chapter/chapter-4-framework-for-project-management-project-management/>
5. Francis A. Organization Structure – Definition, Determinants, Importance and Types [Электронный ресурс] / Abey Francis. – 2013. – Режим доступа до ресурсу: <https://www.mbaknol.com/management-principles/organization-structure/>
6. GroupBWT [Электронный ресурс]. – 2019. – Режим доступа до ресурсу: <https://jobs.dou.ua/companies/groupbwt/>
7. Hartney J. Project Management Steps [Электронный ресурс] / Jon Hartney. – 2016. – Режим доступа до ресурсу: <https://www.projectengineer.net/project-management-steps/>

8. Hartney J. What is a Project [Електронний ресурс] / Jon Hartney. – 2018. – Режим доступу до ресурсу: <https://www.projectengineer.net/what-is-a-project-3/>
9. Key Functions of Your Accounting Department [Електронний ресурс] – Режим доступу до ресурсу: <https://www.pcg-services.com/key-roles-accounting-department/>
10. Know all about 10 Knowledge Areas of Project Management [Електронний ресурс] / Rohith I. – 2020. – Режим доступу до ресурсу: <https://www.edureka.co/blog/10-project-management-knowledge-areas>
11. Kukreja S. Types of Organizational Structures [Електронний ресурс] / Sonia Kukreja – Режим доступу до ресурсу: <https://www.managementstudyhq.com/types-of-organizational-structures.html>
12. Matrix Organizational Structure: Advantages and Disadvantages [Електронний ресурс]. – 2020. – Режим доступу до ресурсу: <https://www.indeed.com/career-advice/career-development/matrix-organizational-structure-advantages-disadvantages>
13. Naydenov P. Different Agile Methodologies: Find Which One Fits Best Your Needs [Електронний ресурс] / Pavel Naydenov. – 2019. – Режим доступу до ресурсу: <https://kanbanize.com/blog/right-agile-methodology-for-your-project/>
14. Organization Structure & Culture [Електронний ресурс] – Режим доступу до ресурсу: <https://slideplayer.com/slide/5276920/>
15. Oswald M. Functional Organization [Електронний ресурс] / Mark Oswald. – 2013. – Режим доступу до ресурсу: <https://www.whizlabs.com/blog/functional-organization/>
16. PMBOK Guide – Sixth Edition [Електронний ресурс]. – 2017. – Режим доступу до ресурсу: <https://www.pmi.org/pmbok-guide-standards/foundational/pmbok>
17. PMBOK, Довідник з управління проектами [Електронний ресурс] – Режим доступу до ресурсу: <https://uk.wikipedia.org/wiki/PMBOK>

18. Prachi M. Matrix Organizational Structure [Электронный ресурс] / Prachi. – 2019. – Режим доступа до ресурсу: <https://theinvestorsbook.com/matrix-organizational-structure.html>
19. Project Cost Estimation & Budget Management Techniques [Электронный ресурс] – Режим доступа до ресурсу: <https://www.guru99.com/learn-financial-planning-project-management.html>
20. Project Management [Электронный ресурс]. – 2016. – Режим доступа до ресурсу: <https://www.projectengineer.net/project-management/>
21. Project management [Электронный ресурс]. – 2020. – Режим доступа до ресурсу: https://en.wikipedia.org/wiki/Project_management
22. Project Management Phases, Knowledge Areas and Processes [Электронный ресурс] – Режим доступа до ресурсу: http://www.moct.gov.sy/ICTSandards/en/27/4_Project_Management_Phases_Knowledge_Areas_and_Processes.htm
23. Project Monitoring & Controlling | 16 Best Practices for a Successful Project [Электронный ресурс]. – 2020. – Режим доступа до ресурсу: <https://blog.masterofproject.com/project-monitoring-controlling-process/>
24. Reuscher D. PMP Practice Questions [Электронный ресурс] / Dori Reuscher. – 2019. – Режим доступа до ресурсу: <https://www.thoughtco.com/pmp-practice-questions-4005393>
25. Roseke B. Guide to the Project Life Cycle [Электронный ресурс] / Bernie Roseke. – 2016. – Режим доступа до ресурсу: <https://www.projectengineer.net/guide-to-the-project-life-cycle/>
26. Roseke B. The Elements of a Project Charter [Электронный ресурс] / Bernie Roseke. – 2016. – Режим доступа до ресурсу: <https://www.projectengineer.net/the-elements-of-a-project-charter/>
27. Roseke B. How to Write a Project Scope Statement [Электронный ресурс] / Bernie Roseke. – 2020. – Режим доступа до ресурсу: <https://www.projectengineer.net/how-to-write-a-project-scope-statement/>

28. Roseke B. Project Scope Statements [Электронный ресурс] / Bernie Roseke. – 2016. – Режим доступа до ресурсу: <https://www.projectengineer.net/project-scope-statements/>
29. Rouse M. quality assurance (QA) [Электронный ресурс] / Margaret Rouse – Режим доступа до ресурсу: <https://searchsoftwarequality.techtarget.com/definition/quality-assurance>
30. Scrum - Quick Guide [Электронный ресурс] – Режим доступа до ресурсу: https://www.tutorialspoint.com/scrum/scrum_quick_guide.htm
31. SOFTWARE DEVELOPMENT & DATA SERVICES [Электронный ресурс]. – 2018. – Режим доступа до ресурсу: <https://groupbwt.com/>
32. The Fundamentals of Front End and Back End Development [Электронный ресурс]. – 2019. – Режим доступа до ресурсу: <https://sagaratechnology.medium.com/the-fundamentals-of-front-end-and-back-end-development-5973ac0910cf>
33. Ukrainian IT industry in 2020: Figures, Facts, and Interesting Statistics [Электронный ресурс]. – 2020. – Режим доступа до ресурсу: <https://lvivcity.com/ukrainian-it-industry-in-2020>
34. Usmani F. Types of Organizational Structure [Электронный ресурс] / Fahad Usmani. – 2020. – Режим доступа до ресурсу: <https://pmstudycircle.com/2012/08/type-of-organization-structure/>
35. Usmani F. What is a Matrix Organizational Structure? [Электронный ресурс] / Fahad Usmani. – 2020. – Режим доступа до ресурсу: <https://pmstudycircle.com/2012/08/what-is-a-matrix-organization-structure/>
36. Westland J. History of Project Management [Электронный ресурс] / Jason Westland. – 2018. – Режим доступа до ресурсу: <https://www.projectmanager.com/blog/history-project-management>
37. What is a matrix organization? Definition and example [Электронный ресурс] – Режим доступа до ресурсу: <https://marketbusinessnews.com/financial-glossary/matrix-organization-definition-meaning/>

38. WHAT IS AGILE? [Электронный ресурс] – Режим доступа до ресурсу: <https://www.cprime.com/resources/what-is-agile-what-is-scrum/>

39. Why Is Project Management Important for Your Organization? [Электронный ресурс]. – 2020. – Режим доступа до ресурсу: <https://kissflow.com/project/importance-of-project-management/>

40. Zabor K. IT industry in Ukraine: overview of major IT hubs [Электронный ресурс] / Khrystyna Zabor. – 2019. – Режим доступа до ресурсу: <https://www.n-ix.com/ukraine-industry-major-it-hubs-overview/>