



УДК 004.4:004.9

DAILY ProM SOFTWARE

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DOI: 10.15673/atbp.v%vi%i.2496

Abstract. The importance of project management in the modern world was analyzed. The problem of using software tools in project management was substantiated. A review of scientific works on the subject of the study was carried out. Four features that describe the need in project management tools were analyzed. A list of 10 alternative tools to Microsoft Project was described. SWOT analysis of Microsoft Project was conducted too. Creation steps of the new software product “Daily ProM Software” were described. All buttons and their functions were justified. SWOT analysis of the developed product was conducted too. The advantages of the program were described in the research.

DAILY ProM is a process mining software tool that is used to analyze, visualize and improve business processes. It is an open-source software developed at Eindhoven University of Technology, and is available for free download from the ProM website.

With DAILY ProM, users can import event logs from various sources, such as ERP systems, workflow management systems, and databases. The software then uses process mining techniques to extract useful insights from the event logs, such as process flow, performance metrics, bottlenecks, and compliance issues.

DAILY ProM supports a wide range of process mining techniques, including process discovery, conformance checking, performance analysis, and social network analysis. It also provides a user-friendly interface that allows users to easily visualize the extracted process models and analyze them using various interactive tools.

Overall, DAILY ProM is a powerful tool for process mining, and is widely used by researchers, practitioners, and students in the field of business process management.

Keywords: project, management, program, software, C++, Qt6, KD Chart, Qt Creator.

1. Introduction

The importance of project management in the modern world cannot be overestimated. Any organization, even the smallest, implements new initiatives. It can be called as projects. These endeavors can be quite different in nature, for e.g. from developing software to sending a man to Mars. But they are all projects. And if in the 1980s the main focus in companies was on quality, in the 1990s – on globalization, then in the 2000s, the speed of implementing initiatives came to the fore. In order to stay ahead of the competition, organizations are constantly faced with the need to develop complex products in a very short time frame. To solve this problem, nothing has been yet invented more effective than project management, which is becoming more and more popular day by day.

Project management helps teams organize, track, and complete project work. A project should be viewed as a list of tasks to achieve a specific goal. Project management will help the team plan, control and execute work to deliver the project on time. With some project management tools, a team can organize all work in one place, share feedback and progress, and ultimately collaborate more effectively. Instead of jumping between spreadsheets, mail, and other programs, project management tools that will help any team should be used. These tools will help to organize the joint work of different groups. The centrally work with plans, information, files and feedback will be done with the help of these. The improvement of team collaboration is important function of these tools too.

2. Literature Analysis

Since the mid-1980s, various software packages (PMSPs) have been introduced to support project management. However, despite the widespread use of PMSPs, project-based organizations are still unsure how to choose the best software for their business applications [1].

A. Castor compared MSP, primavera and open workstation in his study in 2008. He compared MSP, primavera and open workbench. Using two real-time projects as case studies, he compared MSP, primavera and open workbench for resource leveling. The results show that Primavera provides the theoretically least restrictive number of criteria as a ranking rule [2].

Ismail Abdul Rahman identified the commonly used techniques and software for time management and their level of



effectiveness in large construction projects. Data were collected from construction organizations managing large projects [3].

Y.Umesh researched the problem of project management in the building in 2015. He emphasized, that proper planning and scheduling is very essential in construction projects for sinking and scheming delays of the project [4].

Many another scholars researched the problem of the software developing in project management. So Project management software can be a useful tool for effective project management.

2.1. Description of analogues in their use in project management

Project management is really hard. But at the same time, this is a very important job that directly affects whether the team can achieve its goals. Project management software can help to do with almost all management work. There are four features that describe the need in project management tools:

- All employees use different systems to manage their work, leaving projects, tasks, documents, and communication channels in the team scattered across multiple tools.
- Employees don't know what to work on and what to prioritize, and they don't understand how to figure it all out, which is why they spend a lot of their time looking for answers.
- The process of prioritizing and requesting status updates mostly works through meetings, emails, or manual completion of complex spreadsheets.
- So, employees constantly do not have time to complete the work on time.

Project management software is a container for all team's work that allows them to organize everything in one place. There are many software programs for project management.

“Microsoft Project is touted as one of the finest project management software that assists project managers in developing plans, assigning resources, tracking progress, managing budgets, and analyzing workloads” [5].

While Microsoft Project remains very popular, there are a number of alternatives to Microsoft Project that offer amazing features and advanced functionality.

A list of 10 incredible tools worthy of being called Microsoft Project alternatives is described [5]:

- ProofHub. It is versatile project management software with a huge number of powerful features. This alternative of MS Project brings everyone: from team members to clients to projects together in one place. Employee can create tasks, assign them to multiple team members, and track the progress of projects.
- Workzone. It is powerful and easy-to-use project management software with project dashboards and portfolio views that provide full visibility of all projects. Workzone has powerful features that are designed to be used properly by the entire team, even by those with no project management experience.
- Gantt PRO. It is a powerful project management tool based on Gantt charts. It includes a variety of project management functions such as task management, progress management, resource and time management, team collaboration and portfolio management.
- ActiveCollab. It is an excellent alternative to Microsoft Project as an effective project management tool and software that facilitates collaboration and teamwork. This software brings all the data together in one place so that each member can easily access it and communicate with each other.
- Teamwork Projects. The software is specifically designed to allow collaboration and cooperation between team members working together. The project tasks can be defined, assigned them to people and tracked the progress of them.
- Basecamp. It can be easily used by SMEs, large companies and freelancers. People with different roles, responsibilities and goals can use Basecamp to work towards a common goal, which is to jointly complete a project.
- Trello. For keeping everything under control, it uses whiteboard for drawings and card ideas. Trello provides an API part for developers to allow users with coding knowledge to develop applications and add-ons.
- Clarizen. It has all the basic features a project manager needs. Clarizen isn't cumbersome and complicated.
- LiquidPlanner. It works on predictive scheduling and ranged estimates.
- Mavenlink. It is an application that combines project management, time tracking and resource scheduling in one application.

2.2. Microsoft Project Describing

Microsoft Project has been the most popular project management software for many years. Microsoft Project is not necessarily the best choice. It uses mainly because project managers and team members are used to other Microsoft products. Although there are many who challenge and even overtake its dominance, Microsoft remains a giant in the industry. No work with project management software would be complete without including Microsoft Project [6].

Microsoft Project is a project management software used to create project schedules and plans, manage resources and time. Gantt charts, Kanban boards, project calendars and other features for project management professionals can be used in this program.

The SWOT analysis of Microsoft Project for our future research was created (see fig. 1).

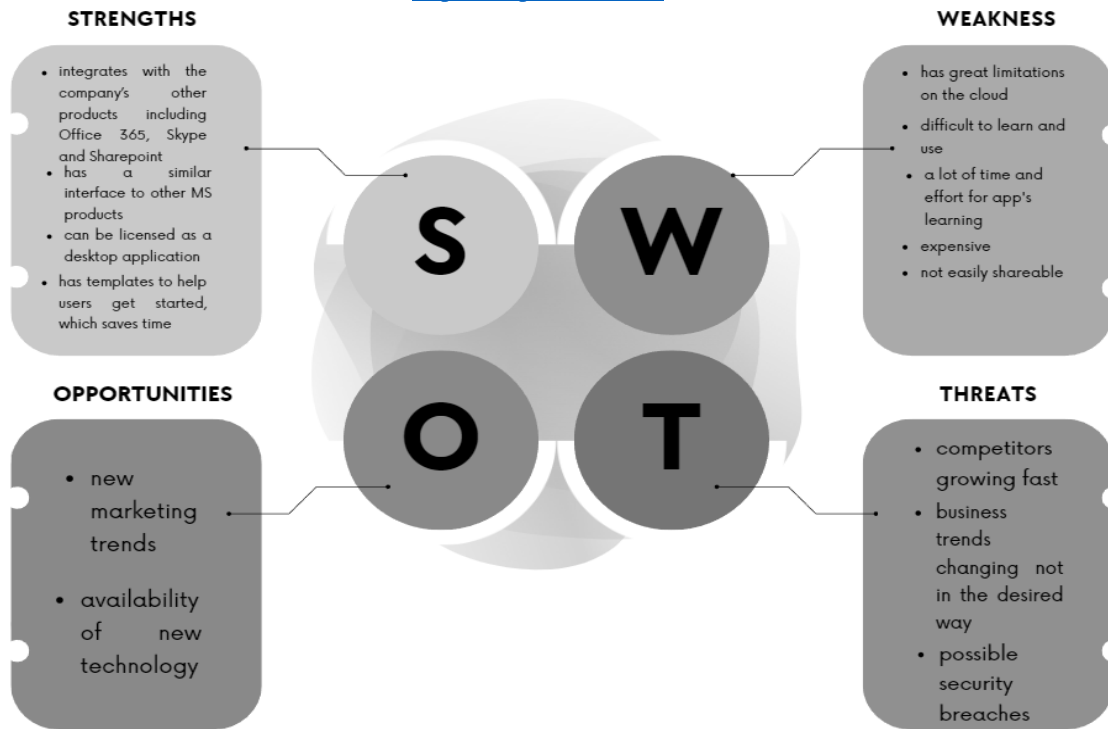


Fig. 1. SWOT analysis of Microsoft Project

3. Object, Subject, And Methods Of Research

The object of research is the software product (Daily ProM Software) for projects managements.

The subject of study is the process and tools of software development for projects managements.

“V-Model” methodology and survey methods werw used in the research.

The peculiarity of the approach (“V-Model”) is the emphasis on testing and checking the functionality of systems during development (see fig. 2). “Software testing is an important link of software quality guarantee, regarding to the embedded software testing that is much more compelxed, needing a clear stage development test model that better controlled” [7].

The survey method was used in the research.

The survey of 300 respondents, who can be potential users, was created (see fig. 3). A poll was conducted among university students. 60 % of students of master’s degree and 40 % of bachelor’s degree are interested of the development. Students of master’s degree are more interested in new development, bacouse many of them work in IT sphere as project managers, programmers, QA etc. So, this development can be usefull for their daily job.

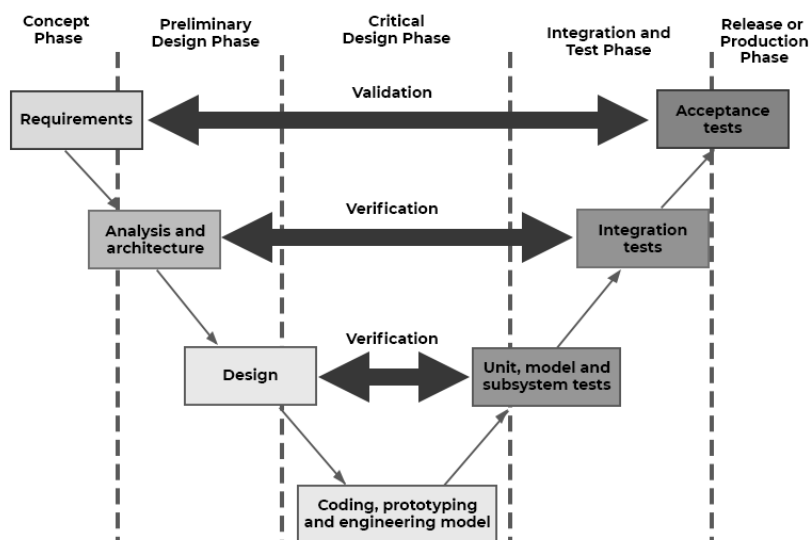


Fig. 2. The V-Model diagram

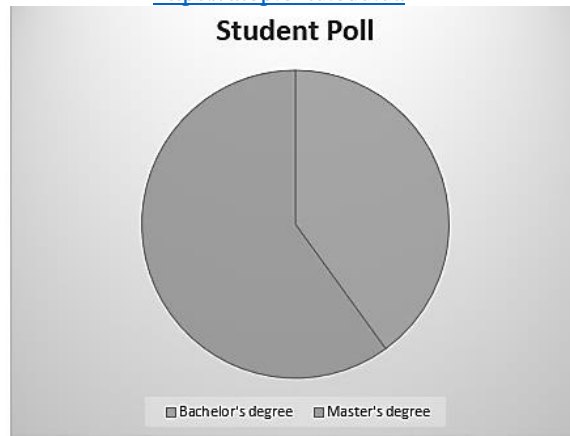


Fig. 3. Student poll according to the interest in our software application

The survey of 30 respondents, who are faculty teachers, was created too (see fig. 4). They are teachers who lead disciplines in project management. 80 % of them are interested in our software development. 20 % of them want to use this application in their subjects immediately.

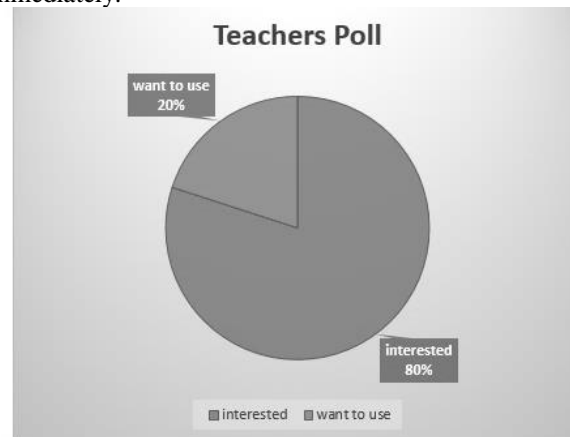


Fig. 4. Teachers poll according to the interest in our software application

4. Results

Analyzing software products for project management, it was decided to create a new software product. It is called “Daily ProM Software”.

C++ programming language based on Qt 6 was selected for implementation the client part. It makes it possible to develop a graphical application in a quick period of time and for different platforms. Qt Creator is an integrated development environment designed for creation of cross-platform applications using the Qt 6 framework.

The user application is implemented in the C++ programming language based on the Qt 6 framework. The distinguishing feature of Qt from other libraries is using the Meta Object Compiler (MOC). It is a compiler that allows dynamically process information in real time.

The description of the operation of the software product has been made below.

The main program window includes such buttons: Name, Type, Start, End, Completion (see fig. 5). Each button has own functions.

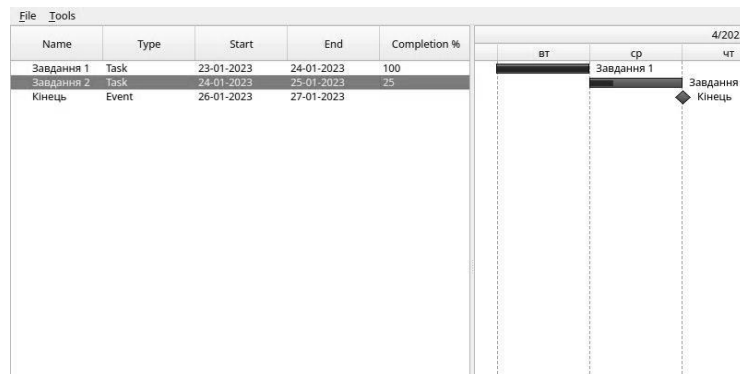


Fig. 5. Main program window



Next figure 6 presents the Gantt chart working. Gantt charts are used for project planning. They are a useful way to show which tasks are scheduled for a particular day. Project managers and team members can view the start, end dates and milestones of the project schedule in a simple stacked bar chart.

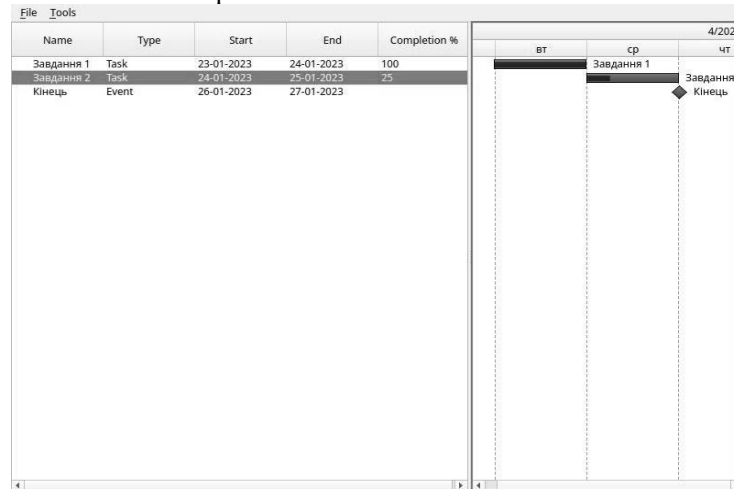


Fig. 6. Program window with Gantt chart

Figure 7 presents program window with tasks and events. A task is a unit of work in a multi-step project. The work must be completed within the specified deadlines and contribute to the achievement of the work-related objectives. Tasks can be further broken down into sub-tasks, which should also have clear start and finish dates.

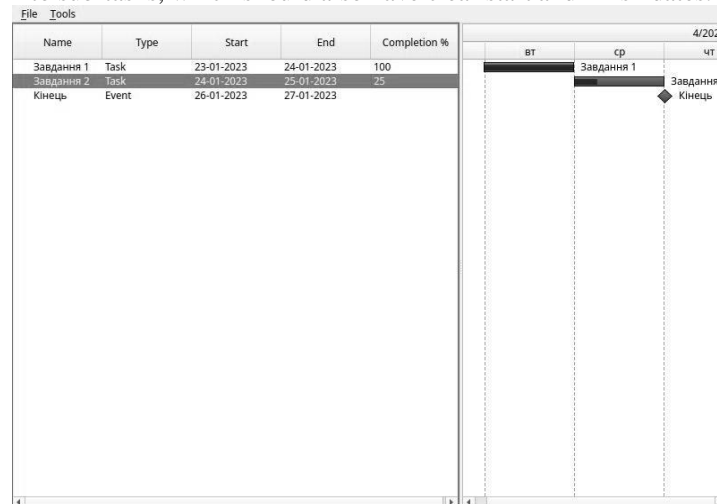


Fig. 7. Program window with tasks and events

All tasks and events have own names (see fig.8).

Name	Type
Завдання 1	Task
Завдання 2	Task
Кінець	Event

Fig. 8. Program window with tasks' names and events



Fig. 9 describes the column with tasks' types and events' types.

Tools		
Name	Type	Start
Завдання 1	Task	23-01-2023
Завдання 2	Task	24-01-2023
Кінець	Event	26-01-2023

Fig. 9. The column with tasks' types and events' types

The date of start of each event or task must be inputted (see fig. 10).

Name	Start	End
	23-01-2023	24-01-2023
	24-01-2023	25-01-2023
	26-01-2023	27-01-2023

Fig. 10. The column with dates of start tasks and events

The date of the end of each event or task must be inputted too (see fig.11).

Start	End	Comple
23	24-01-2023	100
23	25-01-2023	25
23	27-01-2023	

Fig. 11. The column with dates of finish tasks and events

The button "Completion %" helps in easily method of calculating the percentage of task complete (see fig. 12).

End	Completion %
2023	100
2023	25
2023	

Fig. 11. The column with task completion percentages



5. Conclusions

The results of the research allow drawing the following conclusions.

- 1) In order to stay ahead of the competition, organizations are constantly faced with the need to develop complex products in a very short time frame. To solve this problem, nothing has been yet invented more effective than project management, which is becoming more and more popular day by day.
- 2) Project management will help the team plan, control and execute work to deliver the project on time. With some project management tools, a team can organize all work in one place, share feedback and progress, and ultimately collaborate more effectively.
- 3) Instead of jumping between spreadsheets, mail, and other programs, project management tools that will help any team should be used. These tools will help to organize the joint work of different groups. The centrally work with plans, information, files and feedback will be done with the help of these. The improvement of team collaboration is important function of these tools too.
- 4) A list of 10 incredible tools worthy of being called Microsoft Project alternatives was described in the research.
- 5) Analyzing software products for project management, it was decided to create a new software product that is called "Daily ProM Software".
- 6) All buttons and their functions were described in the research.
- 7) SWOT analysis of the developed product and Microsoft Project was conducted too.
- 8) Future research can be dedicated to development the mobile version of developed product.

6. REFERENCES

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