RISK MANAGEMENT IN SOFTWARE DEVELOPMENT

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Most software development projects are risky due to the large number of potential problems that can arise. In many projects, the risks are similar and the most common of them can be identified. These include changing requirements, exceeding deadlines and budget, lack of team member engagement, and the likelihood of employees being fired or temporarily absent for a variety of reasons. Speaking about IT project risk management, it is important to identify the possible sources of these risks. It is also necessary to determine actions to reduce the negative impact of risks on the project if they arise. To do this, the project manager draws up a risk management plan, the creation of which consists of several steps. It is important not to skip any of the steps, as the quality of risk management directly affects the outcome of the project. The purpose of this study is to determine what risks are inherent in software development projects, how they can be caused, as well as how to manage and minimize them.

Key words: risks of software development projects; risk identification; risk management plan; prioritization; changing requirements; risk triggers.

Software development is an activity that uses technological advances and requires a high level of knowledge from different fields. That is why every software development project contains elements of uncertainty, which leads to project risks. The success of a software development project largely depends on risk management. Risks need to be identified, assessed, prioritized, mitigated and managed.

There are some risks that are most commonly encountered in software development projects [0, p. 13] these include:

1. Changing requirements and priorities. A lot of changes happen during a project: concepts, requirements, number of tasks in a sprint, priorities. This risk entails overloaded (or underloaded) sprints, unfinished tasks, a complete or partial redesign of the application, schedule changes, a sudden need to add more people to the team. You can reduce this risk as follows: when introducing changes, you must first analyze how this will affect the current state of the project, how much effort will be required and whether there is a risk of delay. Through analysis, it is possible to intelligently divide responsibilities, make changes in priorities, and provide the client with accurate information about what can (or cannot) be completed.

2. Failure to complete the project on time. Changes in requirements during implementation, poorly estimated task completion times, failed testing, unplanned absences of team members, poor communication with the customer

can all contribute to a project's lead time. Because of this, the client will be dissatisfied, and the team will have a bad working atmosphere.

3. Proper planning can reduce this risk. It is necessary to take into account all factors, analyze possible risks and inform the client about them. When assigning tasks, we should consider the number of team members available, as well as their skills, strengths, and weaknesses. It is important that team members always report on their progress and resolve issues during daily briefings. If it is impossible to meet the deadline, it is necessary to notify the client about this as soon as possible. A good way to deal with everything is to divide one big task into several small ones [2, p. 168].

4. Lack of involvement. The involvement of all team members is essential to the success of any project. Therefore, it is very important that each participant in the process should be committed to a common goal, understand their role and support other team members. When this is not done, there can be delays in deadlines and a negative impact on the motivation of other team members.

5. To minimize this risk, it is necessary to pay attention to all team members and try to understand what can increase their involvement. It is necessary to give them the opportunity for personal growth, talk with them and praise, and also provide them with full information about the projects – so that all team members can feel like an important part of the project.

6. Exceeding the budget allocated for the project. This risk may occur due to poor planning at an early stage of the project and may be caused by the realization of other risks, such as changes in requirements. When the development of the desired product does not fit within the agreed budget, it is necessary to sign an additional agreement with the customer or refuse some functions, having previously agreed with the customer.

7. Risk of loss or shortage of project team personnel. The limited staff leads to delays in project implementation, so by the time the project starts, it is extremely important to attend to the expansion of the team to contain the risk if the project deadline cannot be shifted. It is essential that all team members have the same fundamental knowledge of the project. Depending on how long the employee is absent and at what stage the project is, the project manager must decide whether a replacement is necessary. It will be easier for a beginner to get started if team members share information about the project with him and provide documentation. It is also necessary to create a comfortable environment for employees so that there is no desire to leave it. If working in the company is financially profitable, interesting and exciting, then the likelihood of layoffs is reduced.

An important element of the risk management process is the creation of a risk management plan [3, p. 35]. It describes the response measures that will

be taken for each risk if it materializes. Choosing how to respond will reduce the impact of this risk on the project. As a rule, risk management methodologies provide the following risk management strategies:

1. evasion - the complete exclusion of risk from the project, which may cause the rejection of certain works or a change in the goals of the project;
   reduction - minimizing the likelihood or impact of risk on the project;
2. transfer - transfer of responsibility for the consequences of the risk to a third party (contractor, customer, etc.);
3. acceptance - the formation of an action plan in case of a risk or a reserve of resources to eliminate the consequences.

There are six basic steps to follow to develop a comprehensive and successful project risk management plan. [4, p. 14]. First, risks must be identified and prioritized. This stage consists of identifying all possible risks, describing them, assigning who is responsible for risk management, mitigation measures and the size of the budget allocated to manage this risk. After identifying the risks associated with the project, the next step is to analyze and evaluate each risk to determine its impact on the successful completion of the project. Risks should be analyzed and evaluated taking into account the likelihood of occurrence and the level of impact on the project. The next step is to recognize the triggers for these risks and the warning signs that can tell the project team that their project is at risk. Now each team member takes on their own risks and the team brainstorms ideas on how to overcome all identified risks. Finally, project manager collects all ideas and creates a risk management plan. While the project is being carried out according to the project plan, monitoring and risk analysis are carried out along with it. Risks that have the highest priority should be considered first by the project manager, and their risk mitigation plans should be implemented before the start of the project or according to the action plan. Lower priority risks can be taken care of later but should not be ignored or neglected.

There is no risk-free software development project. As a rule, they are all closely interconnected, so it is very important to identify them at an early stage and prevent their combined impact on the project. It is impossible to predict the future and say for sure whether this or that risk will occur. Therefore, it is necessary to carefully identify all possible risks and consider measures to prevent a potential problem in case it occurs. The project manager must hold regular meetings, resolve problems immediately, document information and data, and motivate all team members. And in this case, the risks will not interfere with project success.

References

1. *Chadli S.* Identifying and mitigating risks of software project management in global software development / S. Chadli, A. Idri // research report. – 2017. – № 413. – pp. 12–22. Doi: 10.1145/3143434.3143453.
2. *Tam C.* The factors influencing the success of on-going agile software development projects / C. Tam // international journal of project management. – 2020. – № 3. – pp. 165-176. Doi: 10.1016/j.ijproman.2020.02.001.
3. *Junior M.* Measuring risks in software development projects / M. Junior, J. Venancio – Chichester : John Wiley & Sons limited, 2019. – 146 p.
4. *Hovorushchenko T.* Method of the software risks management. / T. Hovorushchenko // journal of automation and information sciences. – 2021. – № 11. – Pp. 11–24. Doi: 10.1615/jautomatinfscien.v49.i11.30.