
Project Risk Management Based on Known Project Management Methodologies

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Abstract:

Purpose: The purpose of this article is to present an approach to project risk management taking into account the various project management methodologies currently used in the world.

Design/Methodology/Approach: The experience of project managers in the automotive industry was selected for the study. The article uses the most popular risk methodologies in automotive industry such as Risk management based on IPMA methodology, Risk management based on PRINCE methodology and Risk management based on TenStep methodology.

Findings: As a result of the study, a methodology was selected that is most aligned with the requirements that are placed on the automotive industry regarding project risk management.

Practical implications: Regardless of the chosen method of project management in the traditional approach, there are models and processes for risk management that are an integral part of them.

Originality/value: A novel approach to project risk management.

Keywords: Project risk management and methodologies, risk identification, risk mitigation strategies, risk assessment techniques.

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1. Introduction

Risk management is now a very important aspect in an organization that manages projects. Risk management aims to identify all foreseeable risks, assessing both the chance of their occurrence and the potential risks, which can have a significant impact on the project.

Risks can actually occur at any stage of a project. Sometimes it is related to specific tasks, at other times it may have its origin outside the project and may appear without prior warning. Generally speaking, risks that occur in the later phases of a project can cost more time and money than risks that occur in the initial phases. The main reason, is that total costs and the value of work in progress increase over time.

Some projects, especially those that are small or similar to earlier projects, may no longer require special attention from a risk management standpoint in which case only some form of project insurance may suffice. For brand new projects, therefore, it is necessary to develop a risk management strategy to identify as many possible risks as possible and then determine how to deal with them. As a result of the need to manage and continuously monitor risks, organizations base their management on known and available methodologies (Tyagi *et al.*, 2023; Grima *et al.*, 2020; 2023).

In this article, the most popular methodologies used for risk management in the automotive industry are selected for analysis. These include:

- Risk management based on IPMA methodology
- Risk management based on PRINCE methodology
- Risk management based on TenStep methodology

2. Risk Management According to IPMA

Risk management according to IPMA is different from the PRINCE2 standard not only because of the used nomenclature, but also because of the approach to risk management.

In the case of IPMA, much more emphasis is placed on risk analysis in individual phases of the project. Therefore, the analysis presented below will also be based on the analysis of risks in individual phases (Trocki, 2012). Recalling in the case of the phase model, we distinguish four phases: initiation, planning, implementation and completion.

In the phase of initiation, we can therefore distinguish the following risks: imprecisely specified customer requirements, lack of accurate feasibility analysis, poor budget plan, selection of incompetent manager and project team members.

In the planning phase, we can therefore distinguish the following risks: project manager without support in advance, poor motivation of team members, wrong work breakdown structure, incorrectly designed project schedule, poorly prepared resource plan and their availability, wrong technology of execution, bad selection of subcontractors.

In the implementation phase, we can therefore distinguish the following risks: lack of communication between the team, lack of methodology for introducing changes and their service, project manager oriented to own goals instead of project goals, lack of early warning system, delivery delays, lack of quality control, poor cost control regarding the schedule and progress of work (Lock, 2013; Prince2tm, 2009).

In the completion phase, we can distinguish the following risks: lack of effective supervision over the removal of defects, too early release of resources, lack of complete documentation, delays of customer acceptance, lack of documentation of project experience. During the implementation of a project, it often happens that risk management is triggered only when the risk actually arises or when it can be predicted. It is then used as crisis management - means when it is too late.

Risk analysis and management should be undertaken before the project is launched and taken into account throughout the process of project implementation.

In the case of IPMA, we can distinguish two approaches to risk analysis:

- Quantitative analysis - determines the numerical (monetary) value of the probability and the effects of occurrence of individual risks, as well as the risk of the entire project and operates on monetary values.
- Qualitative analysis - consists in assessing the probability and consequences of identified risks, used for initial risk estimation or in the case of the lack of the possibility of its exact numerical determination.

In the case of both methodologies, the various risk management strategies presented in Table 1 are used:

Table 1. Risk Management Strategies

Risk as	Chance	Avoidance Minimalization Active acceptance Passive acceptance
	Danger	Utilization Strengthening Sharing up Acceptance

Source: Own elaboration.

Transfer - relies on the transfer of responsibility or consequences related to a given type of risk to another group of stakeholders, risk transfer rarely leads to risk elimination, forces others to mitigate, accept or avoid it, the risk can be transferred to contractors, suppliers, clients or insurers.

Avoidance - consists in changing the project plan in such a way as to eliminate a given risk or conditions related to it, or to protect the project's objectives from the possible effects of such a risk.

Passive acceptance - accepts risk without taking any action beyond its documentation.

Active acceptance - consists in creating a retreat plan implemented when the risk event occurs. The retreat plan contains detailed instructions on how to proceed and create a budget reserve for the project.

Reducing - involves choosing solutions with less risk than others. Such action is accepted because it is associated with potentially less unfavorable conditions. This strategy involves reducing the probability and / or effects of an adverse event to an acceptable level. Taking appropriate early action to reduce the likelihood or impact of risks is more beneficial than repairing them (Kerzner, 2001; Prince2tm, 2009).

The risk management plan, as in the case of the PRINCE2 methodology, contains some common elements. In the case of IPMA, the Project Manager is responsible for this plan.

The basic risk management plan consists of:

1. Introduction
2. Description of the project
3. Strategies and methods of risk management
4. Organization
5. Risk management processes and procedures
6. Risk management planning
7. Risk analysis and assessment
8. Risk response plan
9. Risk monitoring
10. Documenting and reporting

A very important aspect for each organization is an individual approach and selection of the appropriate methodology to suit your needs. In managing risk, it is necessary to know the tools and nomenclature, which in turn allow to improve the communication process throughout the organization (Wyrozębski, Jachniewicz, and Metelski, 2012).

3. Risk Management According to PRINCE2

The risk is an uncertain event or a set of events that, if they occur, will affect the achievement of goals. The measure of risk is the product of the probability and the effect of its occurrence. In the context of the project, the objectives of the project are at risk. They include completion of the project together with the achievement of a set of target values, usually concerning time, costs, quality, scope and benefits (Lock, 2013; Prince2tm, 2009).

Risk management refers to the systematic application of procedures related to the tasks of identifying and assessing risks, and then planning and implementing appropriate response strategies. It creates an organized environment for making proactive decisions. For risk management to be effective, it must be identified, assessed and controlled.

The approach to risk management is based on the so-called MoR. Risk management is based on a number of risk management principles, which in turn apply in the context of the project:

- Understanding the project's outline,
- Stakeholder involvement,
- Setting clear project objectives,
- Developing an approach to risk management in the project,
- Regular risk reporting,
- Clearly defined roles and responsibilities,
- Determining the support structure and the environment that supports risk management,
- Monitoring of early warning indicators,
- Establishing a series of reviews and continuous improvement.

The starting point for all projects is to determine the policies and processes of organizations or programs that must be applied. This information may take the form of a risk management policy and guidelines for the management itself. The PRINCE2 methodology recommends that each project should have its own Risk Management Strategy and control tool, the Risk Register (Prince2tm, 2009).

After reviewing the documents at the organization and program level, and before undertaking risk management activities, a Risk Management Strategy for the project should be developed.

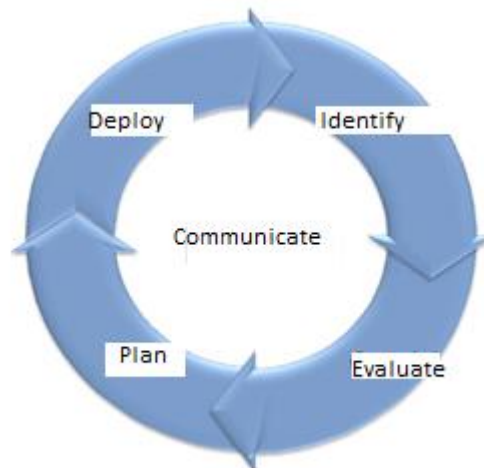
The key decision to be included in the Risk Management Strategy is the Steering Committee's own approach to taking risks, which in turn will dictate the degree of risk that is considered acceptable. This information is recorded in the form of a risk tolerance representing such a level of risk exposure, the exceeding of which leads to the preparation of an Extraordinary Report in order to communicate to the Steering

Committee about the situation.

PRINCE2 recommends a risk management procedure covering five steps:

- Identify (context and risks)
- Evaluate (evaluation and evaluation)
- Plan
- Deploy
- Communicate

Figure 1. Risk management procedure (Trocki, 2012)



Source: Own elaboration.

PRINCE2 recommends that in the case of risk identification, register the identified threats and opportunities in the Risk Register, prepare early warning signals in order to monitor critical criticism aspects of the project and provide information on potential sources of risk, find out stakeholders' views on specific risks. An effective way to identify risks is to use the so-called risk workshop.

This is a group session, designed to identify threats and opportunities. This session should be carried out by a person who knows the creative thinking techniques well. The aim of the workshops is to develop the widest range of risks and their potential owners (Prince2tm, 2009).

PRINCE2 recommends that in the case of risk assessment, pay particular attention to the following: assigning categories to probabilities and opportunities, the ocean of every threat and opportunity in terms of design, materializing threats and opportunities, and determining the extent of changes in the impact of threats and opportunities over the life of the project.

In the case of evaluation, it is necessary to carry out a net assessment of all identified risks and opportunities in the project, if combined. This allows assessment of the overall risk weights and an assessment of whether they fall within the tolerance set by the Steering Committee and whether the project is still business.

The main purpose of planning is to prepare specific management responses to identify threats and opportunities, preferably to remove or reduce threats, and you to maximize opportunities. The next stage is implementation. An important element here is to provide an unambiguous allocation of roles and responsibilities aimed at supporting the Project Manager in managing risks related to the project. The roles in this respect are the risk owner, the person responsible for managing, monitoring and controlling all aspects and the risk response contractor (Prince2tm, 2009).

Risks are communicated through management products:

- Reports from checkpoints,
- Periodic reports,
- Final Stage Reports,
- Final Project Reports,
- Experience Reports.

Special care should be taken when using these reports for external stakeholders, however it should be remembered that the superior document in this case is always the Communication Management Strategy (Prince2tm, 2009).

To sum up the subject of risk management based on the PRINCE2 methodology one should not forget about the roles and responsibilities of individual persons involved in the project implementation. And so on:

- The organization or program management is responsible for establishing a risk management policy in the organization and provides guidance on the risk management process.
- The chairman is responsible for all aspects of risk management, and in particular for ensuring that there is a Risk Management Strategy for the project. In addition, he ensures that risks directly related to the Business Legitimate are identified, assessed and controlled.
- The Main User ensures that risks associated with users are identified, assessed and controlled.
- The core client ensures that risks related to suppliers are identified, assessed and controlled.
- The Project Manager is responsible for the development of the Risk Management Strategy, establishes and maintains the Risk Register and ensures the traceability of risks throughout the duration of the project.
- Project supervision reviews risk management practices to ensure compliance with the Risk Management Strategy,

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- Project support works with the entire team in maintaining the Risk Register for the project.

4. Risk Management Based on the TenStep Methodology

The goal of project management is to fully identify risks to project outcomes and then develop a Risk Management Plan to minimize the likelihood of these risks occurring.

TenStep distinguishes between inherent risks, which are strictly related to the action taken, events and circumstances that are not subject to reduction, and specific risks. In addition, the methodology itself includes references to positive risks, but mainly recommends focusing on the management of negative risks, as there are many more in projects. The method mainly distinguishes two important aspects: processes and techniques.

In the case of process, we can talk about the following activities:

- Planning and risk management,
- Risk identification,
- Risk analysis,
- Risk response planning,
- Risk management.

The risk management process requires the development of a contingency plan for scarce resources in advance, so that the project manager knows how he or she must respond if resources need to be changed or added. Such a plan is not limited to human resources. The project manager should then identify the scarce resources in his project. To identify risks in this case, he can use the risk-sharing structure technique.

Once risks are defined he should consider five ways to respond to that risk: accept, monitor, prevent, mitigate, avoid and transfer. The project manager can ask for provisions for specific risks before starting the project. There is also the option of including risks not identified in the schedule and budget in the process of conducting estimates. For such a risk analysis of interdependent events, a decision tree is used. This technique allows determining the overall level of risk for a series of potential related events.

5. Methodology and Results of the Study

A group of 25 project managers working with different seniority in the automotive industry was selected for the study. The group that was selected for the study is shown in the pie chart for its experience as a project manager in the automotive industry.

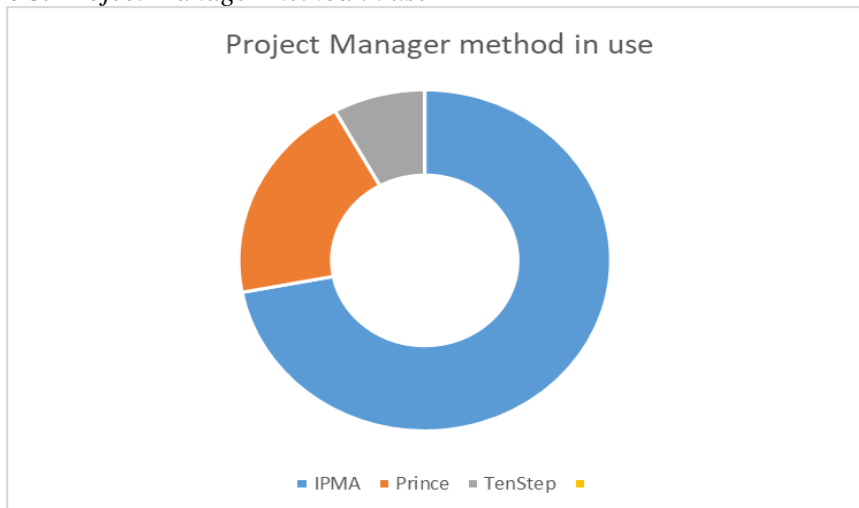
Figure 2. Project Manager experience



Source: Own elaboration.

In their work, all project managers were responsible for managing the project's risks throughout its duration from the initiation phase to the final delivery of the product to the customer. Each manager used various methods and tools to support the project management process. The question posed, "Which project management methodology do you use in your daily work?" yielded the following distribution of responses:

Figure 3. Project Manager method in use



Source: Own elaboration.

Unambiguously from the responses of the surveyed group, it can be seen that risk management using IPMA methodology is closer, as much as 72% of the surveyed people. However, this is nothing surprising since the automotive industry in the Podkarpackie region bases its management mainly on IPMA standards. This is evidenced by the fact that 64% (16 of the people surveyed) are certified project managers and know and use the tools and techniques of the methodology very well.

The PRINCE methodology is used in a different specificity of industries and is nevertheless less known in the Subcarpathian region. The TenStep methodology, in the case of the restrictive requirements that are placed on the automotive industry, can really only be a complement to one of the two known methodologies.

The survey additionally showed a kind of pattern regarding the monitoring of risks and how they are managed in the organization. Each person surveyed confirmed, periodic project management meetings with their project team and the use of a project management monitoring sheet depending on project requirements. Only continuous analysis of potential risks can contribute to the efficiency and success of project implementation.

6. Conclusion

Regardless of the chosen method of project management in the traditional approach, there are models and processes for risk management that are an integral part of them. Although the methods themselves are different, the associated processes for risk management have no significant differences. They distinguish similar and even the same tools, techniques for identifying, assessing risk factors and even responding to the risk that has occurred.

In hard-approach projects (PRINCE2, IPMA), although there are distinctive risk management processes, divided into strategic project management (which emphasizes ongoing activities, responding to risks that arise, or risk management itself), and teamwork (where risk factors are identified, analyzed and evaluated in an iterative approach), the process itself does not take into account the critical success factors that contribute to the existence of potential risks or opportunities when implementing this type of project.

Any organization wishing to manage in a project-based manner should individually select a methodology for itself and apply it to all process levels. It seems necessary for all members of the project teams to know the theoretical basis and to develop a single reporting standard. That's why it's so important that this choice of method is determined right at the start of the project and is applied throughout the project.

Some tools from PRINCE2 or from IPMA are suitable for direct implementation into an organization. Therefore, it is worthwhile to learn about both methodologies

and use them successfully to improve your organization and increase efficiency and productivity.

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