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PROJECT RISK MANAGEMENT THROUGH PMBOK

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Abstract: The article highlights the importance of risk management for the success of projects and organizations, respectively.
Project complexity, technological uncertainty, product innovation, cadence, or progress monitoring are all ways that affect project risk. Therefore, project risk management is a crucial component of the contemporary project management approach and a critical instrument for efficient project planning and control.
Risk management is defined as a collection of procedures that guarantee the recognition, assessment, and response to risks that have materialized and, collectively, it assures the project will proceed as anticipated.
The contemporary evolution of the business environment increases the level of uncertainty of companies, but also of their internal processes, especially of the internal and external environment of projects. Amplifying business risks is determined by high levels of innovation, new technology, commercial arrangements, interfaces, or other external dependencies.
In this increasingly dynamic organizational context, there is an orientation of projects from predictable to incremental ones. In the same way, the reduction and share of risks take place through the increasingly intense involvement of stakeholders, including their participation in the project teams.
The analysis of the evolution of the content of the project risk management is presented by the comparative-evolutionary analysis of this topic in more advanced editions of Project Management Body of Knowledge and other methodologies, which are known and used internationally.
Project risk management process analysis has made it possible to generalize some ways to enhance this area.

Keywords: project management, PMBOK, project risk management, methodology

JEL Classification: B41, M10, O21, O22

Considerations about the project environment

Projects exist and operate in organizational environments (internal and external) that have different levels of influence and effects on project management and its success. Internal and external characteristics of the project environment can influence its entire course. These influences can have a favorable, unfavorable, or neutral impact on the project deliverables, stakeholders, or project team.

The internal factors of the organization arise from the organization itself, and are also determined by the correlation of the project with other portfolios, programs, or organizational projects. These represent:

✓ *Organizational and project management (PM) assets* may include approaches, methodologies, tools, models or techniques applicable to the project.
✓ *Infrastructure* consists of existing facilities, equipment, and information system, including software, and support.
✓ *Resource availability* represents the human, financial, informational, but also material and technological potential, as well as their geographical distribution.
✓ *Organizational culture and governance* include vision, mission, values, organizational hierarchy and relationships, leadership style, and code of ethics.
✓ *Data assets* include the organization's databases and archives of previous projects.
✓ *Knowledge assets* include the general and specialized expertise, skills, competencies, techniques, and knowledge of the parties involved.

The external factors form the general context of the organization and can enhance or constrain project outcomes and represent:

✓ *Regulatory environment* includes national and international laws and regulations with influence on the legality of the activity, industry standards, data security and protection, business conduct, etc.
✓ *Marketplace conditions* represent the factors that determine the company's competitive position: competition, market share, brand recognition, technological development, etc.
✓ *Social and cultural influences* include the political climate, national customs and traditions, patterns of conduct, ethics and perceptions, which are reflected on/through the project team and other stakeholders.

✓ *Academic research* includes industry and market studies, publications and benchmarking results.
✓ *Financial influences* include offers from financial institutions, inflation, taxes and tariffs, etc.

Generalized, the relationship of environmental factors is presented in figure 1.

The dynamic but predictable project environment generates opportunities, and the dynamic but uncertain environment generates major risks.

Apart from the mobility of the environment, the level of risk in projects is determined by the mix of the other 3 characteristics of the external environment:

✓ certainty – the quality and quantity of information available to the organization regarding environmental factors and also the certainty of its accuracy;
✓ the complexity of the environment – the number of factors to which the organization is obliged to react and also the level of a variety of each factor;
✓ interdependence of factors – the ratio in which the change of one factor acts on other factors.
In the same way, the high character of the internationalization of modern business that geographically disperses the resources also determines the risks in the projects and business processes, thus amplifying the importance of coordination activity in project management.

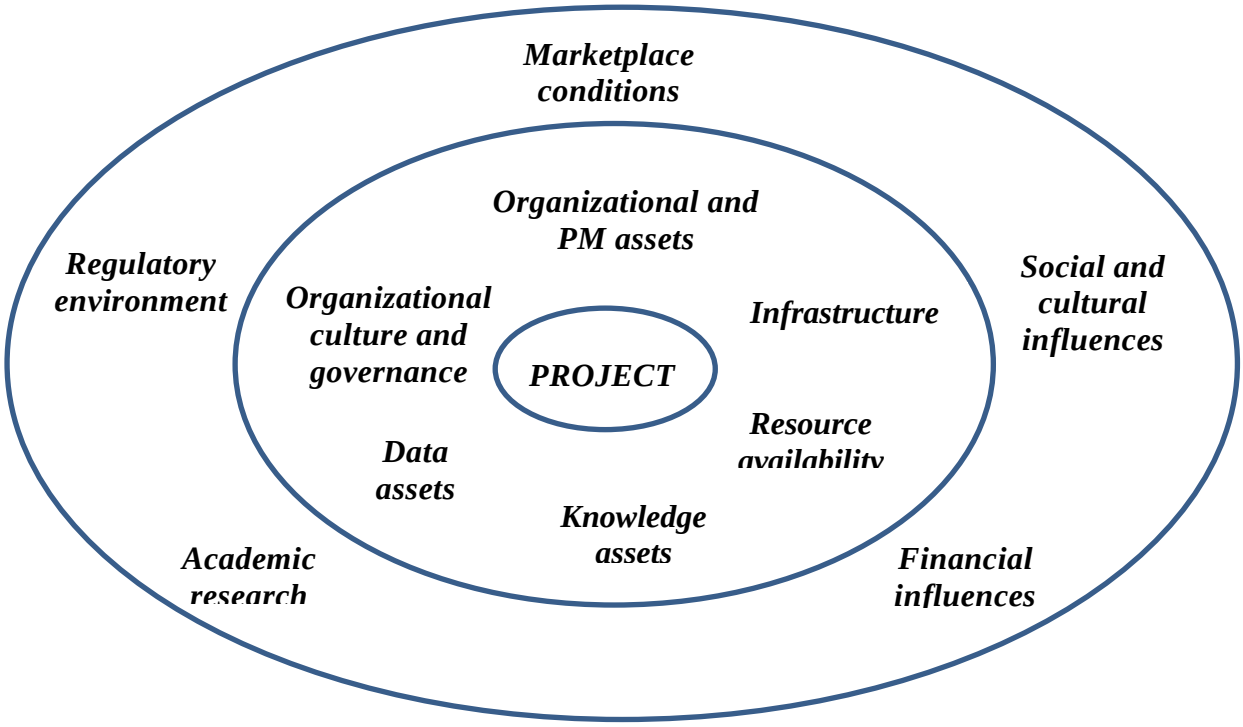

Figure 1 Relation of environmental factors of the project
Source: adapted on PMBOK®GUIDE 7th ed.

The risk influence on the life cycle

According to PMBOK®GUIDE, a risk is "an uncertain event or condition that, if it occurs, can have a positive or negative effect on one or more objectives".

Throughout the course of the project, stakeholders-related project teams must identify and assess known and emerging risks that are both internal and external to the project. The emergence of unidentified requirements from the parties concerned may potentially increase these risks.

Project risks can have a positive effect on it and then take the form of opportunities, but also have a negative effect - dangers. Project teams must capitalize opportunities and decrease threats.

In general, risk responses from the project team should be:

✓ Corresponds to the risk event,

- ✓ Timely,
- ✓ Resource provision,
- ✓ Cost-effective,
- ✓ Agreed to by stakeholders, and
- ✓ Owned by a responsible person.

The level of risk is a variable value both during the life cycle of the project/project management cycle and during the life cycle of its product. In this context, the level of acceptable risk exposure by the main stakeholders such as the project manager, the organization in which it is carried out, and the project client must also be examined.

It is obvious that at the beginning of the project the increased level of uncertainty also generates increased risks, directly dependent on the novelty of the project idea. During the realization of the project, by updating the execution plan, the level of uncertainty/risk decreases, but does not disappear completely. Schematically this relationship is presented in figure 2.

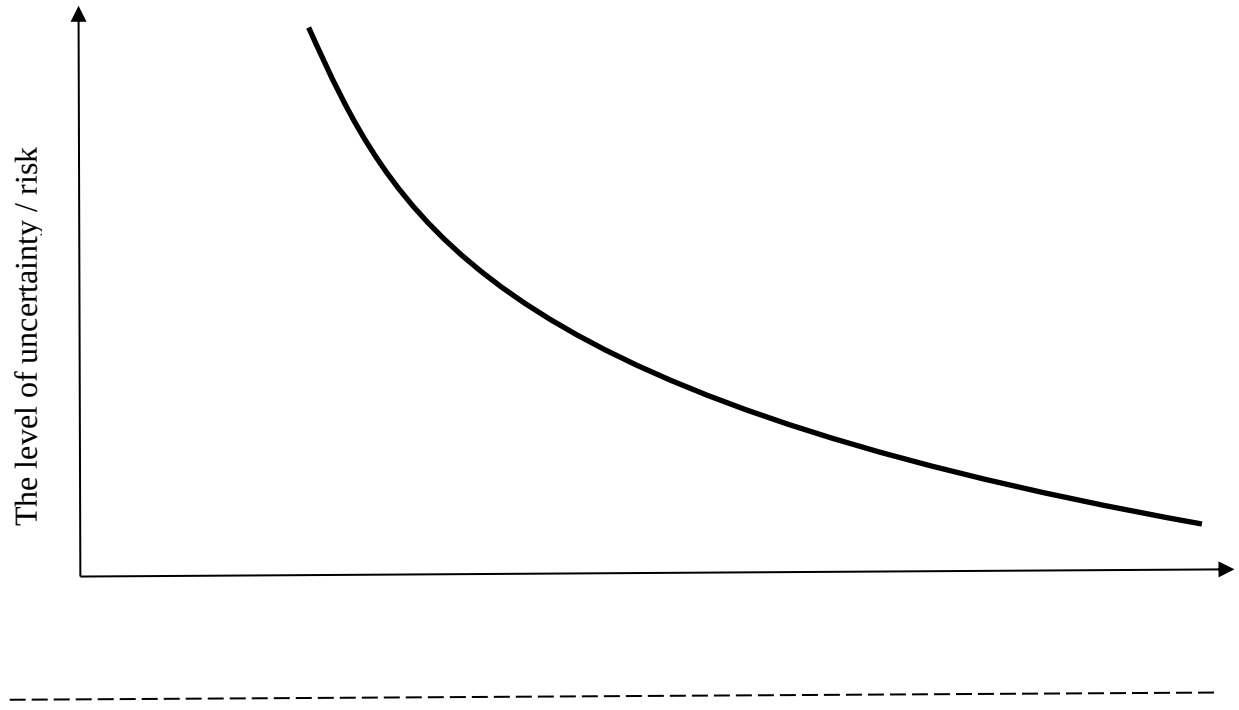

Figure 2 The relationship between the level of uncertainty/risk and project management/project life cycle
Source: authors' own study

In the same way, the phenomenon of uncertainty/risk is also inherent in the life cycle of the product, developed through a program dedicated to a product of the organization/company.

PMBOK defines by product "an artifact that is produced, is quantifiable, and can be either an end item itself or a component item" (PMBOK®GUIDE 7th ed., page 19). Product management involves the integration of people, data, processes, and business systems to create, maintain, and develop a product or service throughout its life cycle.

As shown in Figure 3, the initial product may start as a project deliverable. Throughout its life cycle, the organization through projects can complement or improve certain components, functions or specific features of the product that create added value for customers. In project-oriented organizations, a program can include the full life cycle of a product or service to manage more synergistically benefits and to create own and consumer value.

The iterative, incremental and adaptive characteristics of modern projects also point us toward this approach.

Regarding the level of risk, we can conclude that it is the highest at the initiation phase, being the lowest at the maturity stage of the product and with an increase at the decline stage, determined by the economic effects (especially the recovery of investments) and the possible social ones following the removal of the respective product from the organization's offer.

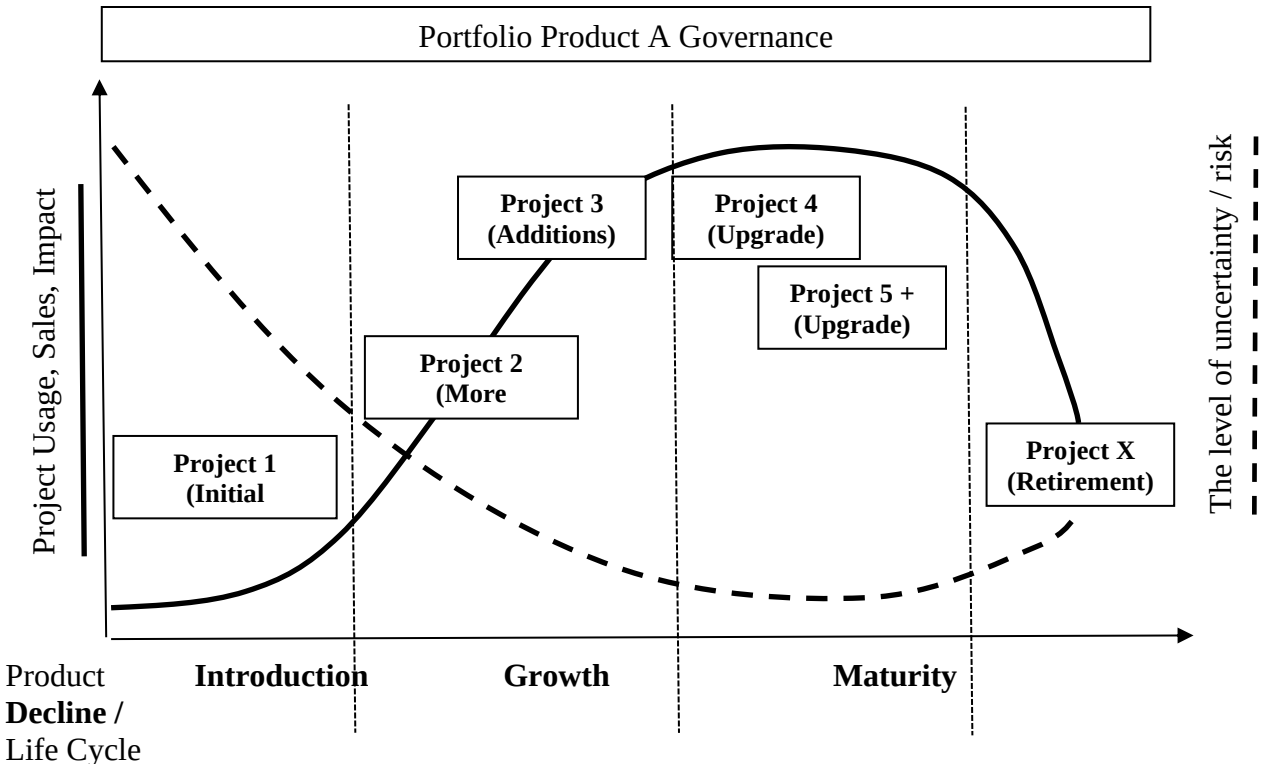

Figure 3 The relationship between the level of uncertainty/risk and Product Life Cycle Phase
Source: adapted from PMBOK®GUIDE 7th ed., page 19

Development of project risk management through the lens of PMBOK evolution

According to PMBOK, Project Risk Management includes "the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project". (PMBOK®GUIDE 6th ed., page 395). In order to maximize the odds of a project's success, project risk management aims to both raise the likelihood and/or impact of positive risks (opportunities) and lower the likelihood and/or impact of negative risks (threats).

Risk management is by importance, in our opinion, an area with major influences on the other PMBOK knowledge areas (in particular, content, time and cost) – determining the success of the project. Being present in all PMBOK editions, along the way, the content of the risk management area has been subject to revisions and additions. In Table 1 we outline the evolution of the content management summary in different editions of the PMBOK.

We can see that during its evolution, PMBOK deepened its risk management processes, developing the related tools. Thus, classic methods and techniques such as Checklists, Flowcharting, Interviewing (Risk Identification); Expected monetary value, Statistical sums, Simulation, Decision trees, Expert judgment (Risk Quantification); Procurement, Contingency planning, Alternative strategies, Insurance (Risk Response Development) and Workarounds, Additional risk response development (Risk Response Control) have been supplemented with new tools such as Data gathering, Data analysis, Interpersonal and team skills, Risk categorization, Strategies for threats and for Opportunities, Audits etc.

Table 1 Evolution of content of the risk management processes in the framework of PMBOK

PMBOK®GUIDE 1st edition (1996)	PMBOK®GUIDE 3rd edition (2004)	PMBOK®GUIDE 6th edition (2017)
Risk Identification – determining the risks that are most likely to have an impact on the project and documenting their characteristics. ***Risk Quantification*** – assessing risks and their interconnections in order to gauge the range of potential project outcomes. ***Risk Response Development*** – establishing	***Plan Risk Management*** – outlining how risk management tasks will be carried out for a project. ***Identify Risks*** – determining and deciding whether risks could have an impact on the project and recording their characteristics. ***Perform Qualitative Risk Analysis*** – prioritizing risks for further action by weighing their impact and likelihood of occurrence. ***Perform Quantitative Risk Analysis*** – calculating the impact (probability and effect) of identified risks on the project's overall goals.	***Plan Risk Management*** – outlining how risk management tasks will be carried out for a project. ***Identify Risks*** – locating the specific causes of each project's risk as well as its individual risks, and documenting their characteristics. ***Perform Qualitative Risk Analysis*** – ranking each project risk according to its likelihood of occurring, its potential effects, and other factors. ***Perform Quantitative Risk Analysis*** – quantifying the impact of all identified project risks as well as other sources of uncertainty on the overall project goals. ***Plan Risk Responses*** – developing alternatives, choosing approaches, and deciding on courses of action to handle both the overall project risk exposure

impro-vement processes for opportunities and reactions to threats. ***Risk Response Control*** – adapting to changes in risk as the project progresses.	***Plan Risk Responses*** – developing options and actions to improve opportunities and lessen threats to project goals. ***Monitor and Control Risks*** – implementing risk-response plans, monitoring identified and residual risks, spotting new risks, and assessing the efficiency of risk management procedures.	and specific project risks. ***Implement Risk Responses*** – implementing approved risk response plans into action. ***Monitor Risks*** – monitoring identified risks, detecting and analyzing new risks, as well as assessing the efficiency of the risk management process throughout the project.

Source: PMBOK®GUIDE 1st ed., 3rd ed. and 6th ed.

Much more simplified content is provided by ISO 21502:2020 Project, program and portfolio management — Guidance on project management, which identifies the following risk management processes (ISO 21502:2020, page 34):

- ✓ ***Identifying risks*** - risks can be found at any time in the project's life cycle, and those that have already been found may change or recur.
- ✓ ***Assessing risks*** - risks should be prioritized for future action after being evaluated for probability, consequence, and proximity.
- ✓ ***Treating risks*** - involving the project team in the creation of alternatives and steps that will increase opportunities and lessen project threats.
- ✓ ***Controlling risks*** - making sure that responses to negative risks minimize interruption to the project and that responses to positive risks maximize the beneficial impact.

The methodology PRINCE2 recommends the following risk management procedure, which is based on Management of Risk: Guidance for Practitioners and contains the following processes (Managing Successful Projects with PRINCE2, page 126):

- ✓ ***Identify*** (Identify context and Identify the risks),
- ✓ ***Assess***,
- ✓ ***Estimate***,
- ✓ ***Evaluate***.

By comparison, the PMBOK methodology presented a more systemic, situational, but also processual approach to project risk management. The development of this complex approach to risk management continues in the PMBOK®Guide 7th edition through the development of the project management principles "Navigate Complexity" and "Optimize Risk Responses", but, tangentially, in others as well. PMBOK®Guide 7th edition (2021) reflects a change in project management content from the 10 Knowledge Areas in previous editions to eight project performance domains - groups of related activities that are critical to the effective delivery of project results:

- ✓ Stakeholders,
- ✓ Team,
- ✓ Development Approach and Life Cycle,
- ✓ Planning,

- ✓ Project Work,
- ✓ Delivery,
- ✓ Measurement, and
- ✓ Uncertainty.

According to PMBOK®GUIDE, the Uncertainty Performance Domain interacts and determines the Planning, Project Work, Delivery, and Measurement Performance Domains from the deliverable perspective. We can see that the latest edition of PMBOK®GUIDE (2021) develops the general concept of uncertainty and risks in projects.

The evolution from predictive to agile in project risk management

Project life cycles can range along a continuum from predictive approaches at one end to adaptive or agile approaches at the other. The project's deliverables and risks are outlined at the outset of a predictive life cycle, and any modifications to these areas are gradually controlled. Deliverables are generated across a number of iterations in an adaptive or agile lifecycle, and each iteration's precise content is established and agreed upon before it begins. In terms of risks, the subsequent iteration typically results in additional ones.

In order to respond to significant levels of change, projects with adaptive life cycles necessitate constant stakeholder interaction. High rates of risk are also produced by complex projects and high rates of change.

An adaptive project's overarching objective will be divided into a list of specifications and work that has to be done, often known as the product backlog. The team will strive to assess how many of the backlog items with the highest priority can be delivered in the following iteration at the beginning of each iteration. Each iteration involves a repetition of the three procedures (gathering requirements, defining the content and creating a WBS). A predictive project, on the other side, starts with these processes and updates them as needed based on an integrated change control process. In this way, the Agile methodology reduces risk in the project's development phase.

The sponsor and customer representatives should be actively involved in the project throughout an adaptive or agile lifecycle to provide input on the deliverables as they are developed and to make sure that the product backlog accurately reflects their current needs. This involvement reduces but also shares the risks between the parties involved in the project.

The project evolution is based on a better understanding of the present risk exposure since customer needs are preserved as a fundamental document that is updated frequently, with each iteration, and work can be rearranged.

The use of cross-functional project teams facilitates knowledge sharing and, as a result, guarantees better risk comprehension and management.

Each iteration's content is chosen with risk in mind, and risks will be found, examined, and dealt with when they arise.

Modern projects are characterized by changing requirements, high risk, or great ambiguity, so the specific content is frequently not known at the start, and significantly changes during

implementation. Early in the project, agile approaches purposefully spend less effort attempting to define and reach a consensus on the project's content and overall risks and spend more time creating the procedure for their continual discovery and evolution. Many project areas discover that there is frequently a discrepancy between the parties' declared requirements and their actual requirements. In order to clarify the requirements, agile techniques purposefully construct and review the evolution of the content and risks of the project stages. As a result, as the project is implemented, its content and risks are defined and revised.

Conclusion

The effectiveness of a project's risk management directly influences its success rate.

The RISC element is related to the content, time, costs, quality and other elements of project management and is a defining one.

Project Risk Management, according to PMBOK, includes "the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project".

For the successful implementation of projects, managers must know and apply situationally different project risk management methodologies and tools.

Risk management provides the foundation for project planning, cost estimation, scheduling and resource allocation, and other management activities that ensure project performance and success.

To align with modern trends and developments project managers must develop their systemic, process, and especially situational views of the project by moving from the predictive approach to the adaptive or agile approach to the project and its risks.

REFERENCES:

A Guide to the Project Management Body of Knowledge 1st edition, 1996
A Guide to the Project Management Body of Knowledge 3rd edition, 2004
A Guide to the Project Management Body of Knowledge 6th edition, 2017
A Guide to the Project Management Body of Knowledge 7th edition, 2021
Agile Practice Guide, 2017
ISO 21502:2020. Project, program and portfolio management — Guidance on project Management, 2020
Practice Standard for Project Risk Management, 2009
Managing Successful Projects with PRINCE2, 2017