

Toward Enhancing Program Risk Management to Deliver Mega Construction Projects

Roozbeh Panahi¹, Katia Rizkallah¹, Ahmed Abbas²

¹Jacobs Solutions Inc.

Toronto, Canada

roozbeh.panahi@jacobs.com; katia.rizkallah@jacobs.com

²Metrolinx

Toronto, Canada

ahmed.abbas@metrolinx.com

Abstract - The main objective of risk management is to support the implementation of effective decisions (i.e., risk-informed decision-making) through the application of a set of well-defined principles, and processes. Here, the concerns raised by significant schedule delays and cost overruns of mega construction projects have been one of the main drivers behind the continuous improvement of risk management practice, including definitions, procedures, and tools and techniques. Among these improvements is the development of guidelines for program and portfolio management by different professional associations and standards bodies to assist project-based organizations in achieving their goals. However, such organizations need to take further steps to have an in-depth understanding of the concepts, create the culture, and build on and support the implementation of required principles, processes, and procedures while customizing available guidelines, which draw a great roadmap toward successful management. This paper is an effort toward further enhancement of program risk management considering recent development in available guidelines/standards. In doing so, it is argued why programs should do more than just program-level risk management, a classical role outlined in standards. For a successful delivery, it is crucial for programs to undertake a range of activities from explicit to implicit risk management. Additionally, a program-level risk identification model is developed which strengthens early risk identification as a vital principle of successful program risk management. Project-based companies should tailor and detail this model according to their culture, environment, appetite, and hierarchy, among other factors.

Keywords: Risk management, Program risk management, Program-level risk management, Risk identification, Risk sources

1. Introduction

The first-ever edition of the PMBOK® Guide published in 1996 by the Project Management Institute (PMI) is one of the early efforts to put together an official document and guide to advance the development of the project management profession, touching on the subject of risk management at the project-level [1]. Later, in light of the importance of risk management in projects, various professional associations and standards bodies began discussing this topic in more details. In 2002, the Institute of Risk Management (IRM), the Association of Insurance and Risk Manager (AIRMIC) and the Public Risk Management Association (Alarm) originated the Risk Management Standard [2], which was subsequently adopted by the Federation of European Risk Management Association (FERMA). And in 2009, ISO 31000 was published as a standard focusing on the implementation of risk management. Since then, new documents and editions have been published by various organizations to address the new requirements in the field of risk management.

Since the complexity and size of projects increased over the last years, and more project-based organizations were established to deliver these mega projects, the need for a more coordinated effort towards their successful delivery became a new opportunity to develop and enhance project management practice, including risk management, at higher levels (e.g., Program and Portfolio levels) [3]. From the scope perspective, programs are initiated in two situations: (1) Delivering a mega project when it requires to be broken to smaller projects, and (2) Delivering multiple mega projects with similar objectives. And from the time perspective, programs are recognized in two circumstances: (1) Before starting the actual activities, (2) During projects' activities. That said, for such programs to be successful, regardless of scope or initiation time, certain control guidelines must be implemented.

The UK Government Central Computer and Telecommunications Agency (CCTA) was one of the first organizations that published a comprehensive guideline called “Managing Successful Programmes” in 1999, to address its internal program management requirements [4]. Later, in 2001 “Project & Program Management for Enterprise Innovation” was published by the Project Management Association of Japan, which conceptually described attributes and principles of a program [5]. In 2006, Project Management Institute (PMI) published its first version of program management [6], and in the same year, the Association for Project Management (APM) started discussing program management in the fifth edition of APM Body of Knowledge [7].

This new approach to program management called for research which helped understand the industry practice and shed light on gaps in available guidelines. For example, the commonality and difference between available guidelines were discussed in 2008 by Hillson, where he proposed a model for risk identification at the program level [3]. In fact, the continuous evolution of industry guidelines/standards over the last few years has been the result of various parties studying program management from different perspectives.

This paper highlights and briefly discusses two areas for improvement in program risk management by mainly focusing on PMI's “The Standard for Risk Management in Portfolios, Programs, and Projects” [8], as one of the most comprehensive documents in this field which complements “The Standard for Program Management” by this institute [9]. After reviewing the generic risk management lifecycle at the early chapters of this document, later in the chapter 6 dedicated to program risk management (8 pages in the standard), the document briefly identifies three main sources of risk at the program-level: (1) Risk cascading from the portfolio, (2) Risk directly identified at the program-level, and (3) Risks escalated from the program components. While visualizing these potential sources of program-level risks, in this paper, more details are provided regarding all such sources with special focus on the third source of program-level risks. Also, this paper discusses hidden yet crucial elements of program risk management that are often overlooked. Available standards including PMI standard introduce program risk management mainly by customizing project risk management lifecycle framework, processes, and procedures. In other words, these guidelines/standards are more focused on program-level risk management. We will argue that program risk management should not be restricted to program-level risk management. Our discussion of program risk management will extend the scope to other aspects that need to be properly included in program risk management plan and fully implemented to support successful program delivery

2. Program Risk Management

The classical view at the program risk management mainly focuses on managing program-level risk (i.e., purely explicit risk management in Fig.1) undertaking a coordinated and centralized manner to achieve objectives not attainable from all efforts at its components' level. That said, standards and guidelines emphasize on customizing project risk management practice at the program-level and defining key steps towards successful management of risks at this level. However, it should be remembered that a program is the focal point of various internal subcomponents (projects, subprograms, technical disciplines, etc.) which makes its position unique regarding exposure to different situations. Additionally, a program is in daily communication with higher organizational levels and all other programs/parties within the organization, while engaging with external stakeholders. So, one would expect that a program should take other roles regarding risk management within a spectrum from explicit to implicit risk management, considering three levels of the risk that a program interfaces with: (1): Project-level risks, (2) Program-level risks, and (3): Portfolio-level risks (See Fig.1 for more details). As illustrated in Fig.1 managing program-level risks, which requires full implementation of the risk management lifecycle framework by the program, is at the far left of the spectrum (i.e., explicit approach), while treating project-level risks mainly by monitoring performance and reflecting on implemented practices (i.e., implicit approach).

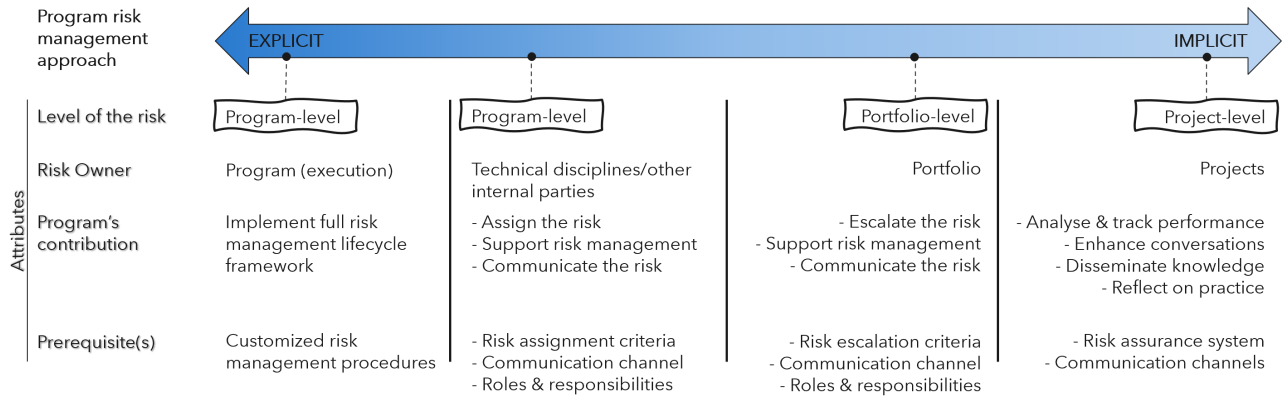


Fig. 1: Contribution of the program to risk management throughout the organization: A spectrum of activities that should be covered in the program risk management plan

3. Program-level Risk Identification

As mentioned before, explicit risk management of program-level risks is the focal point of program risk management, based on available standards. Here, plan risk management, identify risks, perform qualitative risk analysis, perform quantitative risk analysis, plan risk responses, implement risk responses, and monitor risks are the main steps of risk management lifecycle framework (PMI, 2019), where early risk identification plays a vital role. It is evident that procedures encompassing program's definition, characteristics and boundaries, and exposure to different levels of risk, should be developed under the program risk management plan to effectively implement the whole risk management lifecycle framework.

Here, risk identification play an important role. A proactive approach to successful risk management can only be by utilizing various tools and techniques for the early identification of such risks, while benefiting from a well-established procedure supported by a comprehensive program risk management plan. For this, it is crucial to understand potential sources of program-level risks.

Top-down program-level risks are created through the delegation or assignment process. Although most of the strategic risks are expected to be handled at portfolio and organizational levels, some might be delegated to programs in order to meet overall objectives (e.g., deliver the strategy and/or create business benefits). These are the risks that require program-level actions. However, detailed delegation criteria and communication process should be defined in the program risk management plan, based on the program's definition and environment.

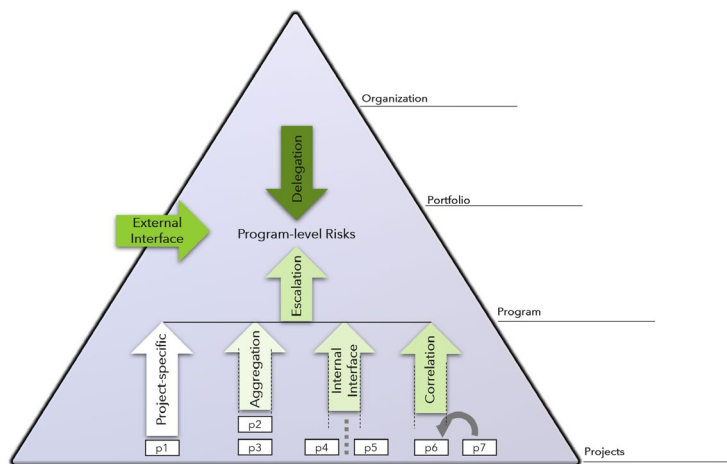


Fig. 2: Contribution of the program to risk management throughout the organization

Generally, **lateral program-level risks** arise at the program-level, taking into account internal or external. Moreover, these risks can be identified through discussions at program's component levels (e.g., subprograms, or **Bottom-up program-level risks** can be triggered at projects level through four potential channels: (1) Project-specific, (2) Aggregation, (3) Internal interface, and (4) Correlation. The first one can result in identification of program-level risks impact on a specific project while the three others can yield to program-level risks impacting more than one project. While projects are facing individual risks, the program should look at them as a whole through different lenses to enable early mitigation either by treating them individually or by utilizing a blanket approach, when one or more than one project are being impacted. Here, developing detailed definitions and procedures for identification of bottom-up risks is crucial, e.g., Risk Breakdown Structure (RBS), and escalation criteria. For instance, RBS can help with highlighting commonalities which should be used as a starting point for further investigation. Also, a clear definition of escalation criteria is required which should be defined in the program risk management plan and implemented through program risk management procedures regarding risk management lifecycle framework.

4. Conclusion

The risk exposure of programs throughout an organization necessitates them to be thoroughly involved in risk management in order to achieve their objectives, including activities ranging from explicit to implicit risk management, from managing program-level risks to monitoring and supporting project-level risks. To accomplish this, programs must establish a comprehensive risk management plan that outlines roles and responsibilities, communication channels, escalation criteria, project-level risk assurance, and customized program-risk management processes and procedures considering program attributes, e.g., commitment, focus, resources, culture, appetite, etc. Since early identification of program-level risks is a crucial principle of success, a detailed program-level risk identification procedure also must be in place that considers all potential sources of risk with concise definitions.

Acknowledgements

I cannot express enough thanks to Metrolinx and Jacobs Solution Inc. management team for their continued support and encouragement. This research would not have been possible without the inspirational support and meaningful contribution of my colleagues Katia and Ahmed. The paper is sponsored by Jacobs Solution Inc.

References

- [1] Project Management Institute, A Guide to the Project Management Body of Knowledge, Sylva, NC: Project Management Institute Standards Committee-PMI Communications, 1996.
- [2] Institute of Risk Management, A risk management standard, Institute of Risk Management, 2002.
- [3] D. Hillson, "Towards program risk management", in *Proceeding of PMI® Global Congress 2008*, North America, Denver, 2008.
- [4] Central Computer and Telecommunications Agency, Managing successful programmes (1st ed.). London: The Stationery Office, 1999.
- [5] Project Management Association of Japan, A Guidebook of Project & Program Management for Enterprise Innovation, Volume 1 Revision 3. Tokyo, Japan, Project Management Association of Japan, 2005.
- [6] Project Management Institute, The Standard for Program Management (1st ed.). Newtown Square, PA, USA: Project Management Institute, 2006.
- [7] Association for Project Management, APM Body of Knowledge (5th ed.), High Wycombe, Buckinghamshire, UK: APM Publishing, 2006.
- [8] Project Management Institute, The standard for risk management in portfolios, programs and projects, Newtown Square, PA, USA: Project Management Institute, 2019.
- [9] Project Management Institute, The Standard for Program Management (4th ed.). Newtown Square, PA, USA: Project Management Institute, 2017.