

# Risk and Quality Integration<sup>1</sup>

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## Introduction

This paper establishes practical guidelines regarding how and why to integrate risk management and quality management at a program level. Specifically, precise points of integration regarding plans, tools, controls, and various similar facets of both risk and quality management are explored. Furthermore, the necessity of integrating risk and quality management at the program level, to include possible adverse outcomes due to a lack of integration, are addressed. Finally, the specific roles and responsibilities of key stakeholders regarding the successful integration of risk and quality at the program level are denoted.

## Specific Points of Integration

The purpose of the risk management process is to ensure that risk management activities are standardized, thorough, and conducted at the appropriate level and time (PMI, 2017b). Risk management planning will provide a framework of potential opportunities and threats, along with strategies to capture opportunities and mitigate threats throughout the life of the program (Kerzner, 2013). The purpose of the quality management plan is to describe how quality objectives will be attained through specific procedures, policies, and activities (PMI, 2017b). Quality management planning also provides a thorough review of resources, processes, and activities required to achieve quality objectives and stimulates program and project personnel to perform an in-depth review of quality, both philosophically and quantitatively (Kerzner, 2013).

Risk and quality management share multiple points of integration (PMI, 2017a). At the strategic level, the project management plan includes both a quality management plan and risk management plan. Neither of these plans is created in a vacuum, and they are therefore considered with respect to the other when created. Specific to the risk management plan, “risk is initially addressed during project planning by shaping the project strategy” (PMI, 2017, p. 398). In other words, initial risk assessment generally consists of large-picture risk identification, with particular attention paid to stakeholder risk tolerances of individual project risks (risks that impact a project objective) and overall project risks (risks that impact the project as a whole) (Pritchard, 2015; PMI, 2017b). These risks include potential challenges in consistently meeting quality standards and objectives. Quality standards are generally contractually stipulated quality acceptance protocols while quality objectives are the organizational adopted quality goals (for example, a manufacturing quality standard for a widget may be 10mm +/- .25mm contractually, while the organization adopts a quality objective of 10mm +/- .1mm). If an initial risk management exercise is intended to drive overall project strategy, and quality management is inherently included in risk identification, the bottom line at the strategic level is that risk management and quality management are irrevocably inseparable.

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At the tactical level, risk management is most easily identifiable by its most visible artifact, the risk register (PMI, 2017a). The risk register lists program risks, risk analysis results, and risk responses in a standard format. The register is updated at all periodic risk meetings and is generally linked to the work breakdown structure (WBS) at the work package level (Prichard, 2015). The quality management plan, at the tactical level, is also an iterative process, with updated quality standards, objectives, quality assurance protocols, and quality control procedures linked to the WBS at the work package level. In other words, line managers and employees would most likely encounter both risk analysis and quality information together when examining a specific work package. Typically, work package information will include hyperlinks to the relevant risk register and quality management plan excerpts applicable to the work package in question. Practically speaking, line personnel and line managers can examine a work package and click on the appropriate box to review associated work package risks (threats and mitigation strategies, opportunities and capture strategies) and quality concerns (standards and objectives). An example of a work package is provided in Figure 1. Risk management and quality management are, therefore, intertwined at both the strategic and tactical levels.

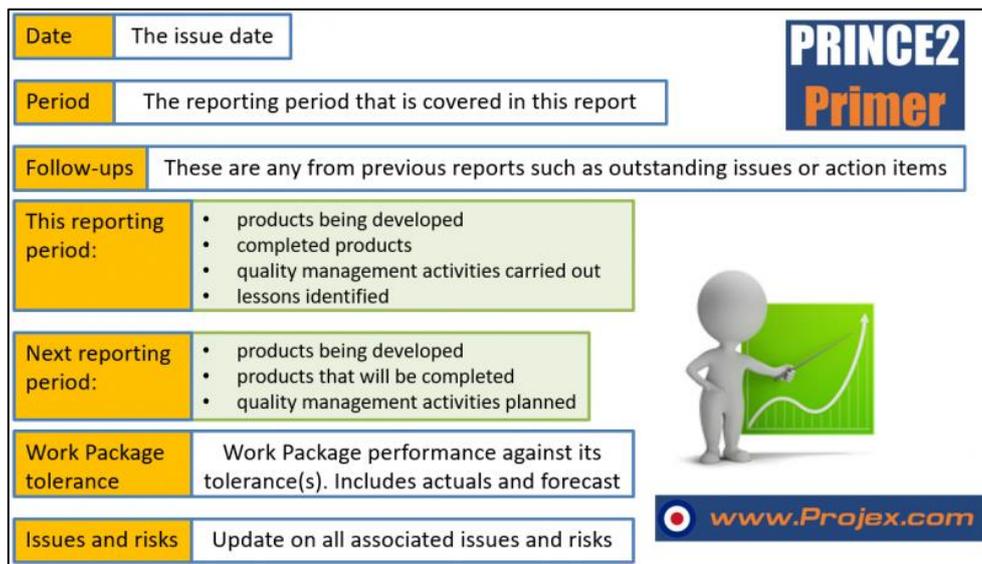


Figure 1. An example of a work package (Litten, 2017).

It is also important to stress that PMI (2017) identifies both risk management and quality management as iterative processes that repeatedly occur throughout the program or project in question. In other words, a program or project manager should be conducting both risk and quality management processes and sub-processes regularly to identify emerging risks, ensure the risk management plan is fully applicable and current, confirm risk thresholds remain the same, review quality assurance and quality control documentation, review the appropriateness of quality objectives, and otherwise verify that both the risk and quality processes are working within tolerance (PMI, 2017). Also, administrative tasks such as updating the risk register, risk meetings minutes, quality management plan, or other appropriate documentation must be accomplished either during or immediately after meetings.

## Components

Possible risk and quality tools include the following (PMI, 2017a):

- SWOT analysis: a SWOT (Strengths, weaknesses, opportunities, threats) analysis is typically conducted at the conceptual level during the initial program/project planning (perhaps as early as the business case exercise) and can also be a part of both risk and quality management (PMI, 2017a). Specific to risk, it is used to help identify internal risks generated throughout the life cycle of the program (PMI, 2017b). The analysis also identifies projected opportunities that may materialize due to organizational strengths, as well as possible threats that may manifest due to organizational weaknesses, as seen in Figure 2. From a quality perspective, a SWOT analysis can help identify and quantify quality challenges, strengths, and opportunities relative to, and as a function of, an honest assessment of the organization’s ability to meet and potentially exceed quality standards and objectives.

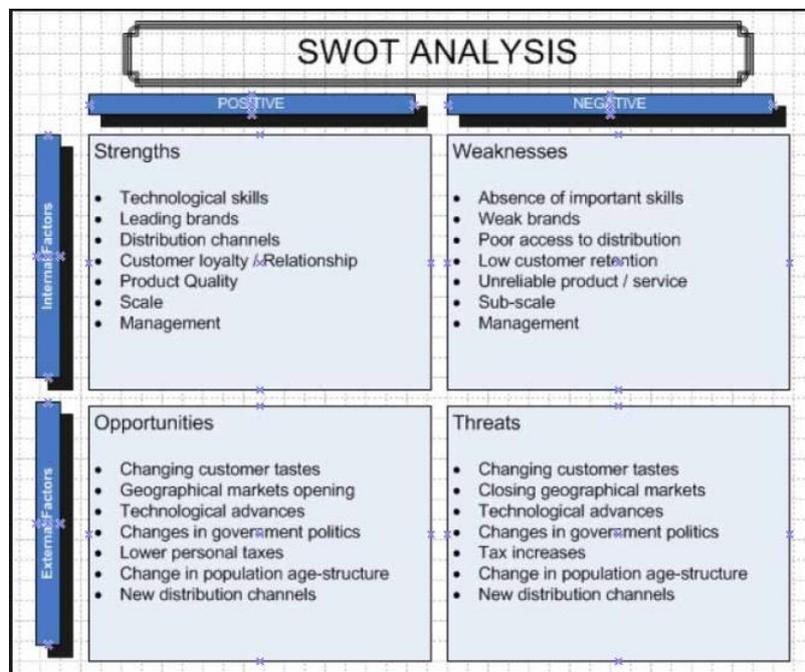


Figure 2. An example of a SWOT analysis (Meyer & Scrima, 2007).

- Pareto charts: From a risk management perspective, a Pareto chart, also known as a Pareto distribution diagram, identifies risk severity by graphically representing and projecting the impact of a risk event against the probability of its occurrence. An example is provided in Figure 3. From a quality management perspective, a Pareto chart can be used to identify quality trends, failures, and initiate and examine fault-cause analysis in the event of quality system failures (PMI, 2017a).

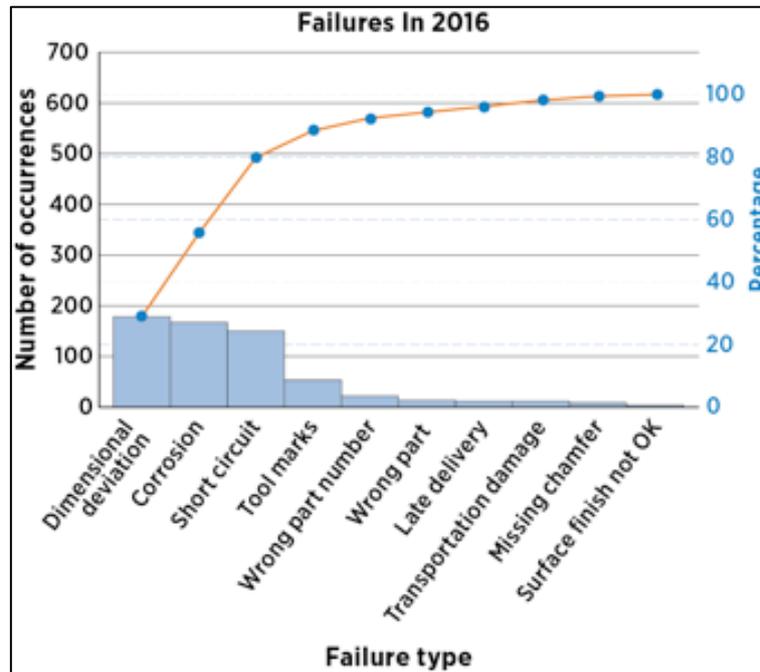


Figure 3. Example of a Pareto chart (ASQ, 2019a).

- Control charts: Control charts are a statistical modeling technique commonly used for quality control analysis (PMI, 2017a). The intent of a control chart is to provide, at a glance, a statistical analysis of whether a process is in or out of statistical control. In other words, the upper control limit, lower control limit, and standard expectation are listed on the chart, with data points drawn from quality control documentation plotted against them, as seen in Figure 4. A program manager can see if the process is to be considered statistically in control via numerous control chart rules, specific to the control chart in question, that should be followed (PMI, 2017). Less commonly utilized in the risk management arenas, control charts are nonetheless a possible technique in assessing a risk management plan via plotting risk events against projected and actual occurrence rates. In this case, a control chart would have the projected risk probability/impact as the CL and the data points would be the risk occurrence and impact, respectively. The purpose of such a control chart would be to provide insight as to how accurate a risk management plan (and the probability-impact assessment, in particular) has proved to be.

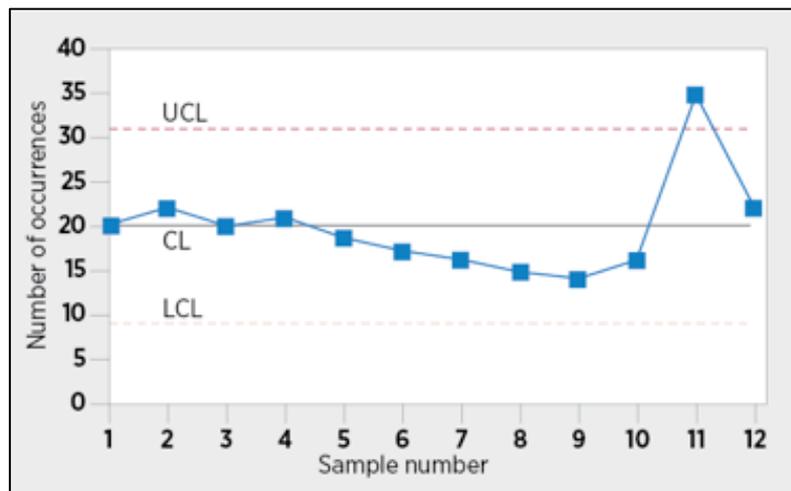


Figure 4. An example of a control chart (ASQ, 2019b).

- Ishikawa diagram: As seen in Figure 5, an Ishikawa diagram (also known as a fishbone diagram), is commonly used as a quality management tool for identifying cause-and-effect, overall brainstorming, and sorting information (ASQ, 2019c).

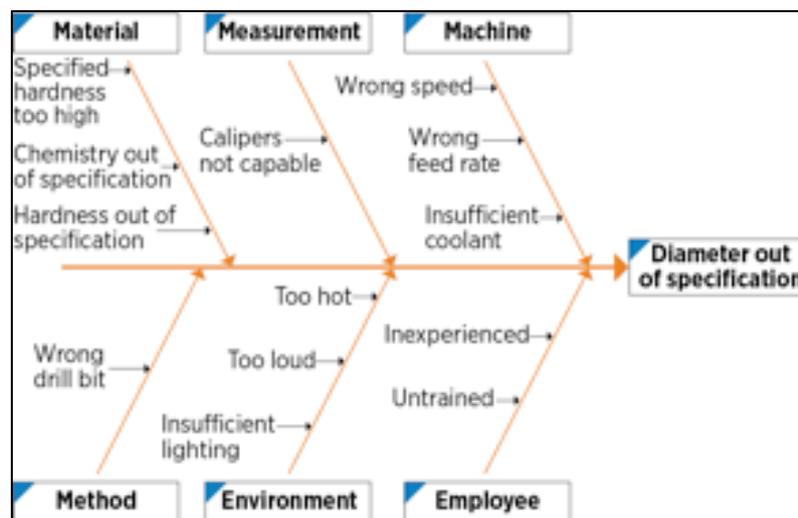


Figure 5. An example of an Ishikawa diagram for quality management (ASQ, 2019c).

For quality management, the Ishikawa diagram is critical regarding fault-cause and root-cause analyses (PMI, 2017a). Also, an Ishikawa diagram can yield vital risk management information if utilized slightly differently, as seen in Figure 6. In this case, a team brainstorms potential risks and the impact thereof. In other words, the risk fishbone diagram is similar to a traditional probability-impact matrix, but in a graphical and less math-intensive form.

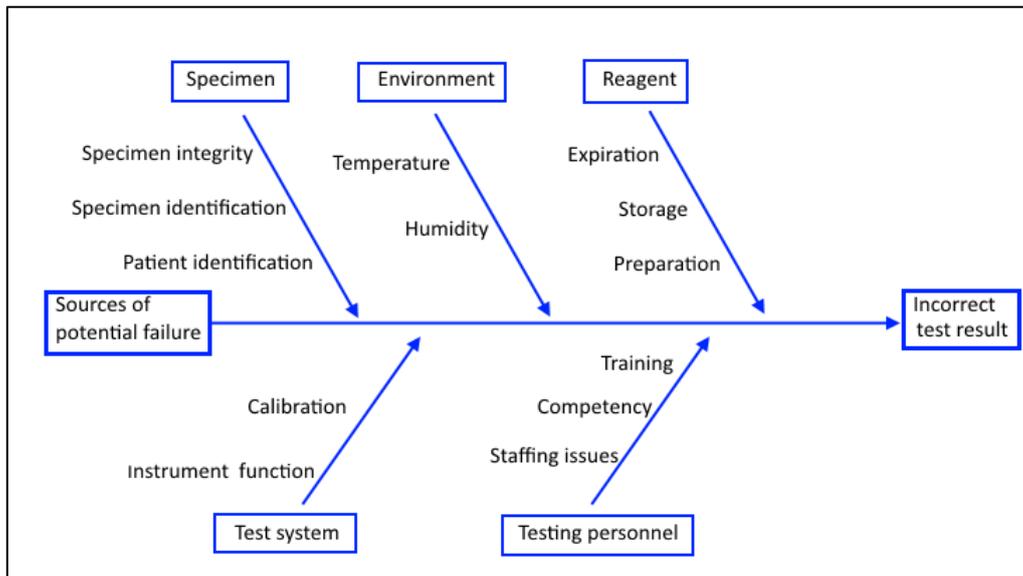


Figure 6. An example of an Ishikawa diagram used for risk analysis (LabCE, 2019).

### The Necessity to Integrate Program Practice Areas

Quality management can be described as integrating an organization’s quality standards, objectives, and policies into a formal plan to empower managing, planning, controlling, and monitoring product quality, as well as otherwise achieving stakeholders’ expectations and objectives (PMI, 2017a). Risk management can be defined as a formalized approach to risk planning, identification, analysis, monitoring, response planning, and mitigation implementation. These two processes are inherently linked, as risk management contains threats and opportunities regarding quality, and the quality management plan must be traceable to the risk management plan regarding threats, opportunities, and the mitigation actions relative to both. Furthermore, all management plans under the project management plan (including the quality management plan) should be formed with consideration to the risk management plan (Kerzner, 2013). PMI (2017a, p. 279) goes so far as to unequivocally state that “the information in the risk management plan and quality management plan work together to successfully deliver product and project success.”

### Results

The results of a successfully integrated risk management plan and quality management plan is most likely a successfully integrated program/project management plan (PMI, 2017b). Assuming a program manager follows PMI guidance regarding ensuring that all subsidiary project plans are created according to the risk management plan, then all plans should attain vertical and horizontal alignment (PMI, 2017a). As seen in Figure 7, and per PMI guidance, the risk management plan is one of the first plans developed in any program. Indeed, program initiation often includes risk discussions, such as establishing stakeholders’ risk thresholds (PMI, 2017b).

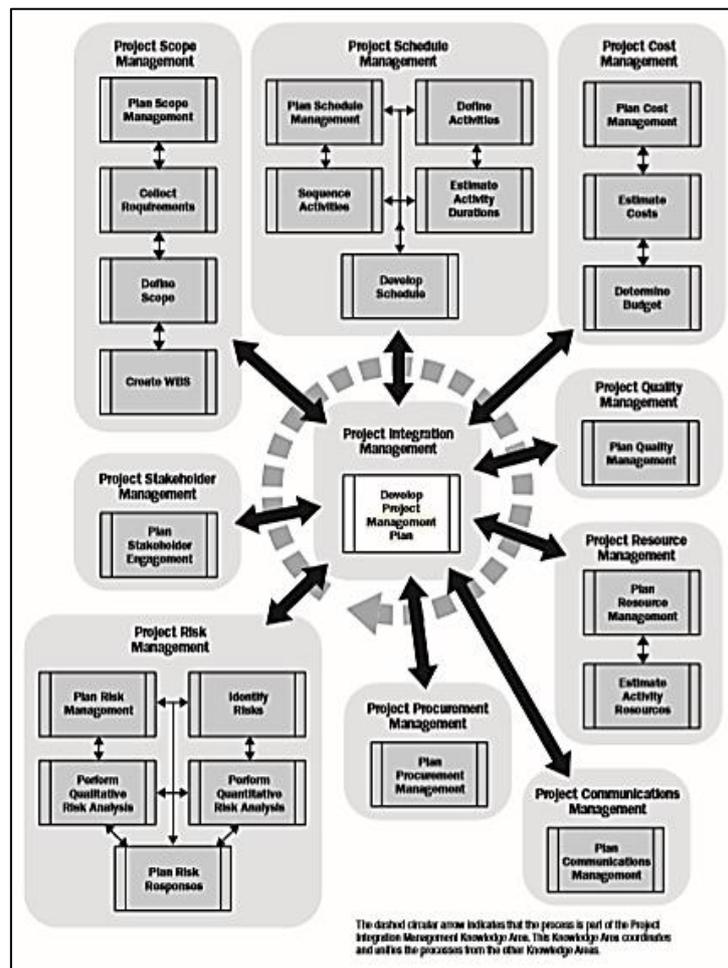


Figure 7. Project management plan (LabCE, 2019).

If the risk management plan is one of the first formal plans created upon program initiation, and all other plans are created with regards to the risk management plan, a program should by definition possess integrated risk and quality management plans (PMI, 2017a). Also, according to Popescu & Adina (2011), integrating risk and quality concerns is a natural extension of the traditional management functions of planning and controlling. Furthermore, Popescu & Adina (2011) state that risk and quality plans should be integrated because:

- Risk management systems and quality management systems both output to the senior management level and into keystone organizational processes.
- Both processes contain elements of continuous process improvement.
- Executive guidance, feedback, and overall management expertise are necessary for both risk and quality management.
- Risk and quality management can share qualitative and quantitative monitoring, controlling, and reporting tools such as Pareto charts, Ishikawa diagrams, control charts, and SWOT analyses.

The lack of integration between risk and quality management systems would not only violate industry program and project management principles, it would likely lead to a lack of vertical and

horizontal strategic alignment, duplication of effort, confusion regarding possibly conflicting information located in a specific work package, or myriad other negative impacts to a program (Durivage, 2017). However, perhaps the most severe disadvantage to possessing an unintegrated risk management plan and quality management plan would be the tendency to be reactionary to program risk and quality problems instead of preventing these problems from ever occurring (Durivage, 2017). Current program and project level guidance requires the use of forethought, planning, and an overall holistic examination of a program in the initial stages of the program lifecycle to prevent, as much as possible, future overruns and complications regarding program and project scope, cost, and schedule (PMI, 2017a; PMI, 2017b). A lack of integration between the risk management plan and quality management plan, therefore, can be reasonably expected to result in problems, potentially critical, throughout the program or project lifecycle.

### **Specific Integration Processes and Methods**

The risk management and quality management plans are both subsidiary plans of the project management plan (PMI, 2017a). However, this relationship should not be interpreted as meaning that risk and quality are only considered after the project management plan is written; instead, the risk management plan and quality management plan, along with the other subsidiary plans, are collated into what will become known as the project management plan (PMI, 2017b). Furthermore, preliminary risk and quality analysis can be considered an input into the business case of a program/project, meaning that risk and quality concerns can, and most likely will be, initially considered at the executive level before the program/project has a charter (PMI, 2017a). Risk and quality concerns, therefore, can be characterized as two complementary processes that iteratively occur from program/project conceptualization through project closeout (PMI, 2017a).

### **Roles and Responsibilities**

At the executive level, risk and quality management is key to the business case of the program/project in question. In other words, executive leadership, in consultation with subject matter experts (SMEs) and various appropriate stakeholders, will determine if it is appropriate to commission a program/project charter based on the projected benefits of the program/project. Benefits may be economic, technological, ecological, focused on internal process improvement, or similar characteristics seen to be appropriate for the organization (PMI, 2017a). Risk and quality concerns will be a vital component of the business case and the program/project benefits plan. Should a program/project charter be granted, executive leadership will most likely focus on program/project updates and general monitoring activity in a traditional executive role.

The project charter establishes a program/project, authorizes the existence of the program/project, establishes the program or project manager and outlines the authority held by the program or project manager, and authorizes the appropriate managers to apply and expend organizational assets in furtherance of the program or project goals (Kerzner, 2013). Regarding PMI's standards for program and project management, the program or project manager will retain responsibility for executing the program/project in such a way as to lead their team to achieve the organizational goals of the program/project (PMI, 2017a). Part of the program/project manager's responsibilities include forming teams and committees of SMEs, appropriate stakeholders, and program/project personnel to create, maintain, monitor, update, and regularly publish updated quality management and risk management plans.

For instance, a program/project manager may choose to retain sole authority to update the master risk management plan and quality management plan or delegate that responsibility to a designated team lead. In either case, a manager of a sizeable program/project would most likely form a risk management committee and quality management committee consisting of SMEs and appropriate stakeholders to develop a risk management plan and quality management plan (PMI, 2017a). Part of the risk management plan consists of explicitly defining how to conduct risk management actions for the program/project, including specific methodology for identifying and analyzing risk, risk response identification and implementation plans, and risk monitoring (Kerzner, 2013). In other words, the risk management committee will precisely delineate which team members retain responsibility for specific facets of risk management, how these team members will identify and analyze risks (probability-impact assessment, risk breakdown structure, Pareto charts, Monte Carlo simulations, or similar methods), how to develop risk response strategies and detail their implementation, and conduct periodic risk monitoring activities, including time frames, responsible parties, reporting formats, traceability to the WBS, and similar factors. Also, the committee will establish a risk register to be updated at regular intervals (PMI, 2017a; PMI, 2017b). Practically speaking, the risk committee will also populate the project schedule with their requirements for meetings, assessments, and other real-world matters, and will schedule the appropriate personnel accordingly.

For the quality management plan, the program/project manager will follow a similar strategy of establishing a core quality team consisting of SMEs, appropriate program/project personnel, and appropriate stakeholders to establish quality standards and objectives and to sharpen program and project focus regarding quality, reinforce corporate expectations regarding quality, and reduce overall program and project costs and schedule impacts due to rework, returns, and product unacceptance (PMI, 2017a). Plan components will most likely include, at a minimum, quality standards, quality objectives, quality roles and responsibilities, deliverables and processes subject to quality review and process improvement, required quality assurance and quality control tools, reporting formats and timetables, corrective action procedures, and specific continuous improvement procedures (Kerzner, 2013).

Regarding integrating the risk management and quality management plans, the prudent program or project manager will also institute project integration meetings. These integration meetings will include key personnel from both the risk and quality management teams and will consist of a thorough review of each plan with the specific intent of ensuring the two plans are integrated. In fact, recent guidance suggests that some of the key positions on both teams should be filled by the same individual (for instance, establishing one individual as the coordinating official for both the risk and quality management plans for initial plan development and establishing one individual as the reporting and monitoring official for both the risk and quality management plans during the execution phase) (Durivage, 2017). Specific mechanisms to ensure program/project risk and quality management integration are numerous and are necessarily tailored to the program or project in question; however, the bottom line that risk and quality concerns are unequivocally related, interdependent, and necessary for program or project success is firmly established in the literature (Popescu & Adina, 2011).

## **Conclusion**

In this paper, specific guidelines regarding how to practically integrate risk and quality management were prescribed, including how and why program-level risk and quality integration

is critical. Also, specific points of intersection and potential overlap between risk and quality management were established, along with the specific roles and responsibilities of the personnel performing the operational process of risk and quality management integration.

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## About the Author



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