

## 11.4

# Project Risk and the Project Complexity Profile

### Learning Objectives

1. Identify the relationship between project risk and external, internal, technical, and environmental complexity.

Risk seems to have a positive correlation to complexity. High-risk projects are in most cases highly complex. The process of conducting a risk analysis focuses on understanding what can go wrong and the likelihood that it will go wrong. The project team then develops a project mitigation plan that addresses the items that were identified as high risk. The complexity analysis explores the project from the perspective of what elements on the project add to project complexity. The result of this analysis is the information needed by the project leadership to develop an appropriate execution plan. This execution plan also contains the risk management plan.



Image by Michigan Municipal League (MML)

Although increased complexity on a project increases the project risk profile, risk is only one component of the complexity profile, and the manageability of the risk is also reflected in the complexity level of the project. For example, the organizational component of the project may be extremely complex with decision making shared among several independent clients. The project management team will develop an execution plan that includes developing and maintaining alignment among the various clients. Although the organizational risk of the project decreases with the development of the execution plan, the organizational approach of the client did not change the complexity level of the project. If the Darnall-Preston Complexity Index (DPCI) is used to rate the project, high ratings in each category carry their own types of increased risks.

## **External Complexity**

Projects that have a high score in the external complexity category in the DPCI are larger and longer than usual for the project management group and the project manager and the available resources are lacking. Due to lack of experience on this size project, unknown risks are significant. The inadequacy of resources will cause risks that are more predictable.

## **Internal Complexity**

Projects with high scores for internal complexity have risks to the budget, schedule, and quality due to organizational complexity and changes of scope due to lack of clarity in project and scope statements.

## **Technological Complexity**

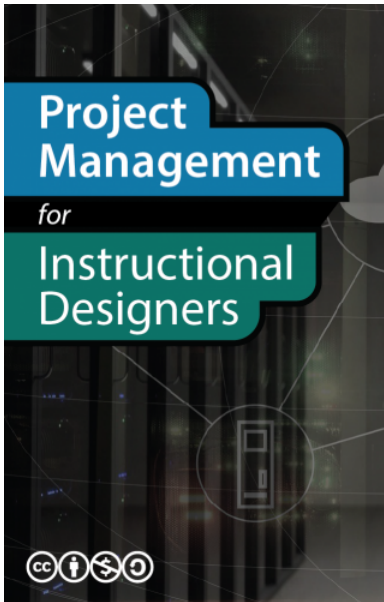
High scores in technological complexity are associated with high levels of risk due to unknown flaws in the technology and lack of familiarity with it. These problems result in risks to the schedule, budget, and quality.

## **Environmental Complexity**

Environmental complexity includes legal, cultural, political, and ecological factors. High scores for complexity in this category imply high risks for delay and expensive resolution to lawsuits, public opposition, changes for political considerations, and unforeseen ecological impacts.

## Key Takeaways

- There is a positive correlation between the complexity of a project and the risk. Increased levels of complexity imply more people, newer technologies, and increased internal and external unknown factors.
- High scores for external complexity imply high risks to the schedule, budget, and quality due to unknown factors and limited resources.
- High scores for internal complexity imply high risks to the budget, schedule, and quality due to organizational complexity and changes of scope due to lack of clarity in project and scope statements.
- High scores for technological complexity imply high risks to the budget, schedule, and quality due to unknown flaws in the technology and lack of familiarity with it.
- Environmental complexity includes legal, cultural, political, and ecological issues. High scores for complexity in this category imply high risks for delay and expensive resolution to lawsuits, public opposition, changes for political considerations, and unforeseen ecological impacts.



Wiley, D. et al. (2018). Project Management for Instructional Designers. EdTech Books.  
<https://edtechbooks.org/pm4id>



**CC BY-NC-SA:** This work is released under a CC BY-NC-SA license, which means that you are free to do with it as you please as long as you (1) properly attribute it, (2) do not use it for commercial gain, and (3) share any subsequent works under the same or a similar license.