## Member Communication Experience

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# Uncertainty in Large Complex Projects

## Key Points

- Uncertainty is an inability to foretell consequences or outcomes.
- There is often a failure to give uncertainty sufficient attention, assuming that more is known about the future than can be rightfully assumed.
- There is a reluctance to qualify or quantify uncertainty for fear it will impact confidence in risk assessments.
- When one acts as if everything is a risk, there is an increase in the chance of failure.
- When one acts as if everything is unknowable, uncertainty gets blamed for inaction.
- Strategies for managing uncertainty are laid out.

## Introduction

in projects is often conflated with , and the two terms are used interchangeably. All too often uncertainty is then treated in the same way as risk, or worse ignored. In large complex projects, large pools may exist that are associated with project complexity.

This Executive Insight looks at uncertainty in projects and contrasts it with risk; identifies sources of uncertainty in projects; and outlines strategies for managing project uncertainty.

determined. Finally, unknown unknowns lead to the unexpected—the uncertainty that is the focus of this Executive Insight.

## Contrasting Uncertainty and Risk

The best way to understand the differences between uncertainty and risk is a side-by-side comparison as shown in Table 1. Uncertainty often receives insufficient attention, assuming more is known about the future than anyone has a right to assume. Once the differences between uncertainty and risk are understood, a door opens to multiple potential outcomes that are limited only by the way the world is perceived.

Similarly, everyone thinks about uncertainty and risk differently,[1] which is why group efforts around identifying each and every asso

| Table 1<br>Contrasting Risk and Uncertainty | |
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| Risk | Uncertainty |
| | |
| Risk is an outcome which can be calculated through measuring probabilities. | Uncertainty concerns the unknown future. |
| Probabilities can be assigned. | Probabilities cannot be assigned. |
| Multiple alternatives resulting in a specific outcome where the probability of the outcome is known. | Multiple alternatives resulting in a specific outcome where the probability of the outcome is not certain and may be unknowable. |
| Measured in quantitative terms. | Cannot be measured in quantitative terms as the probabilities are unknown. |
| Risk can be minimized by taking necessary precautions. | Uncertainty cannot be minimized. |
| Risk, in principle, is calculable, and predictions can be expressed statistically or as mathematically determined probabilities. | Uncertainty is characterized by events in the future that are unknown and/or their consequences cannot be estimated/quantified. |
| Risk recruits the orbitofrontal cortex, striatum, insula, and posterior parietal cortex.[2] | Uncertainty recruits the amygdala and parts of the frontal cortex such as the inferior frontal gyrus, and the dorsal lateral prefrontal cortex. |
| Risk is the product of events regarded as having known outcomes. | Uncertainty exists in events with unknown probabilities and outcomes. |

## Sources of Uncertainty in Projects

Uncertainty is a lack of precise knowledge about what the truth is, either qualitatively or quantitatively. This lack of knowledge can reflect a current gap with respect to the present or near future or more likely a later period in time. There is often a reluctance to qualify or quantify uncertainty for fear it will impact confidence in risk assessments. This undermines the central goal of good risk management to produce the best possible assessment of project outcomes and strategies to assure their achievement.

Table 2 outlines some sources of uncertainty on projects. They have been segregated into sources within the project context and external to it.

| Table 2<br>Sources of Uncertainty in Projects |
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Project Team

| Table 3<br>Managing Project Uncertainty | |
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| Uncertainty-appropriate team based behaviors: Flexibility, optimism, valuing time/decisiveness, and a focus on changing areas of uncertainty. | |