

## **Leveraging Machine Learning Models for Complex System Architecture & Design Decisions**

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During architecture and design of complex systems, ensuring that the right and optimal architecture/design decisions are made is a challenge. Significant uncertainty is encountered while making architecture and design decisions for complex systems. Often, the learning of whether the decision is optimal or not, and the impact on the Measures of Effectiveness (MOEs) of the system, occur late in the development lifecycle. System architects and designers undergo various experiential learnings during the development of many systems over the years.

In this tutorial, we will discuss how to leverage machine learning models to learn from the decision learning cycles and advise on the uncertainty of various decisions. We will learn techniques for codification of decisions and approaches to progressively mature the architectural decision knowledge base, through machine learning models. Two key models will be illustrated - Learning Cycle Model that embodies the experiential decision learnings (in terms of learning cycle consequences and duration), and the Uncertainty Model that is used for assessing and monitoring the uncertainty of the various architecture design decisions.