Analyzing project and product risk (Axiom 2) in an axiomatic design framework

Matt Pallaver

Target Audience
Designers of products, processes, software and business strategies.

Value Proposition
Traditional risk processes are referred to as Table-top risks and are often ad-hoc and generally incomplete. Even worse, often the assessment of product maturity (reduction of development risk) is delayed until prototype testing. Delayed identification of problems causes delays and cost overruns. Axiomatic Design provides a systematic risk assessment and mitigation framework that operates at an early phase of the design process, concept synthesis. Attendees will learn how to systematically identify (and mitigate) project and functional risks at the concept synthesis phase to minimize the probability of development delays and cost overruns.

Abstract

Axiom 2, the information content axiom, of the Axiomatic Design process is the most powerful concept of Axiomatic Design. Axiom 2 introduces risk assessment as a criterion in the concept synthesis process. Moving risk assessment forward (earlier) in the design process to the concept synthesis phase, as opposed to traditional development processes that apply risk assessment after the design has been completed, saves significantly on development iterations and project costs.

Traditional Axiomatic Design process instructions define the Axiom 2 risks in terms of system and design ranges. These measures are not generally available at the concept generation phase, and because of this, the power of the axiom is underutilized.

This tutorial session presents a more practical and useful axiom 2 deployment of risk analysis on an Axiomatic functional decomposition structure using the industry standard Failure Mode and Effects Analysis (FMEA) risk assessment technique on an FR-DP decomposition framework. This technique has been proven out over more than 25 teams of working engineers in the past 2 years.

The class will be led through a case study of traditional risk assessment and functional decomposition risk assessment applying FMEA as the axiom 2 technique to evaluate solution concepts.