Uncertainty in Engineer-to-Order Project Planning: An example of Empirically Grounding Analytics Research

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Abstract

Stochastic programming provides a rigorous approach to decision-making under uncertainty but often falls short when applied to complex real-world problems. To enhance the relevance of stochastic models for practical applications, it is essential to identify and connect meaningful abstractions of real-world phenomena to decision modeling, deepen the understanding of key decision-critical aspects, and integrate insights from these models with empirical knowledge.

This approach, at the intersection of empirical and analytical research, is known as Empirically Grounding Analytics (EGA), and it plays a critical role in making decision models more widely applicable in Operations and Supply Chain Management. This guest lecture presents an EGA research process that demonstrates how insights from stochastic optimization have contributed to the development of availability heuristics for decision-making and enabled finding good planning solutions for engineer-to-order projects involving complex uncertainties and dependencies, without the need to solve large and complex stochastic programs.