## 51. DESIGN SPACE EXPLORATION

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## SUMMARY

The most successful engineering projects begin with discovery – conceiving a rich array of ideas to solve a problem or address a need. But the power of such discovery is too often sacrificed to schedule pressures, resource constraints. Add to this the toolset barriers and hamstrung work processes that make it a struggle for discipline experts to look beyond their own silos and work more collaboratively as a team – to achieve the critical but elusive goal of gaining a systems-level view of the project and their role in it. The result is familiar: engineering teams find themselves forced to settle on a design concept without high confidence that it's the best, most cost-effective or most robust choice.

An emerging solution to this quandary is design space exploration (DSE), both a category of methods and a new generation of software tools designed to radically advance the ability of engineers and multidisciplinary engineering teams to discover an array of possible design concepts early, rapidly and fluently evaluate tradeoffs, variants and sensitivities, then select the best.

The presenter conceptualized and defined PIDO (process integration and design optimization) as a distinct and novel segment of the engineering simulation software market in its nascency. Now he takes this concept forward to the state of today's art with a survey of the emerging DSE arena, in many respects a superset of the original PIDO functionality domain. The presentation will focus on the author's research into how leading engineering organizations are deploying DSE technologies, and developing methods and work processes to maximize their business impact.