

Chapter 12

One-Step Continuous Product Platform Planning: Methods and Applications

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Abstract This chapter presents two methodologies, Selection-Integrated Optimization (SIO) and Comprehensive Product Platform Planning (CP³), which convert the inherently combinatorial product family optimization problem into continuous optimization problems. These conversions enable one-step product family optimization without presuming the choice of platform and scaling design variables. Such approaches also enable taking full advantage of continuous optimization methods.

12.1 Introduction

In developing a successful product family, designers must translate the qualitative leveraging strategies into useful customer requirements to guide platform-based product development (Simpson et al. 2006). To this end, the engineering design community has developed and employed effective quantitative methods over the last two decades. The majority of these quantitative methods use some form of

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