

# Preface

Product design and development can be understood as some kind of information-based factory performing the product development process (PDP). The goal of the PDP was to create a concept or design for producing a product, which reduces risk and uncertainty while gradually developing a new and error-free product, which can then be realized by manufacturing, selling, and delivering to the customer. PDP itself is people-based, complex, and nonlinear, with high ambiguity and uncertainty. Consequently, a wide spectrum of variables can affect its success, and not surprisingly, over time, over budget, and low quality are commonplaces on PDP.

Through this book, we aim to present a series of high-performance product design and development best practices that can support creating or improving a product development organization. Rather than being a book about Toyota or any other company applying lean, this book is strongly rooted in the lean philosophy and includes discussions of systems engineering, design for X (DFX), agile development, integrated product development, and project management.

The “Lean Journey” proposed herein takes a value-centric approach, where the lean principles application to PDP let the choice of tools and methods emerge from the observation of the particularities of each company. Therefore, learning lean product development (LPD) is not about learning tools, but rather understanding how to apply the philosophy. Indeed, the lean journey is about mind-set and culture change rather than adopting tools and techniques. Many of the tools and techniques already in use in your company might be used in the lean way.

The scope of the book includes university students majoring in engineering and professionals working in the various fields of engineering as well as in related fields outside of engineering.

We have been using the book’s contents to teach a “lean product development” course to graduate students in engineering for the past six years. Based on this success, we intend to reach Product development and lean product development university courses at the graduate and undergraduate levels as well.

Since the design and development of products is the aim of most engineering areas, we target engineering courses in a broad sense, both undergraduate and graduate.

Also, the growing trend of lean makes the book suitable to summer courses and short courses that aim practitioners and people interested in applying the lean product development techniques in their daily use. In this case, we can reach a broader audience than engineers since product development is a multidisciplinary endeavor. Particularly, we have a close relation with business and marketing professionals, since they also deal with introducing the right product into the market.

Indeed, during the past six years, we taught people with backgrounds in engineering (mechanical, electrical, mechatronics, software, and chemical) and those in related fields such as business, logistics, industrial design, Web site design, and law.

The light, straightforward, and practical narrative makes the book suitable to be read by companies' executives that are interested in better understanding how the lean philosophy suits the development of products, services, and products as services in their particular companies.

We strongly believe that the book's practical approach is accessible to this broad audience.

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