

About This Guidebook

There's waste in your product designs, and it's costing you a fortune! Oh, it may not look like waste to you...at least not yet. But soon you will begin to see the profits that are being squandered and the opportunities being missed. More important, you will learn how to *solve* cost problems at every stage of product development. You are about to begin a guided tour of product cost-reduction methods, beginning at the earliest stages of project selection, and ending with the launch of a successful and highly profitable new product. Along the way, I will introduce you to eighteen *lean design tools* that are practical, efficient, and immediately deployable. Each tool addresses a specific opportunity for cost reduction during product design: As a group they represent an integrated approach to achieving the highest possible product value at the lowest achievable manufacturing cost.

Before we go further, let's establish the intended audience for this book. This is a guidebook *for* practitioners, *by* a practitioner. All of the methods you will learn can be implemented at the level of an individual designer, a product development team, or even throughout an entire organization. In other words, these tools are meant to be *used*. If you are a member or leader of a product design team, welcome to the tour. If you manage an engineering, marketing, or manufacturing organization, please join the group. Improvement champions, manufacturing engineers, Six-Sigma blackbelts, quality specialists, procurement folks; you're definitely in the right place. If your firm is committed to lean manufacturing and looking to expand its success, you deserve a front-row seat; the tools in this guidebook are specifically designed to dramatically enhance your efforts toward a lean enterprise. Other interested readers are welcome as well...provided that you are comfortable with the pragmatic (and decidedly informal) tone of this material.

Just a few administrative details and we'll be on our way to the first stop on our journey. I've described this work as a guidebook, and that is the analogy you should keep in mind as you proceed. It is my intention that this book become dog-eared and worn through constant use. Graphics are used extensively to illustrate key concepts. Templates, forms, and worksheets are provided wherever possible to help you hit the ground running with your new knowledge. To assist you in expanding your knowledge, I've taken the liberty of providing lists of references (along with my personal ratings) at the end of

each major section of the book. Even the chronological order of presentation is intended to convey the sense of a journey; from the soft and fuzzy world of conceptual design to the final traumatic birthing process that characterizes the transition of new products into production.

Well, the tour is about to leave the station (or terminal, or dock...choose whatever fantasy you wish). As you board, take a quick look at the summary of lean design tools provided in the two figures that accompany this introduction. The Lean Design Tool Quick-Reference Guide lists all eighteen tools, with a brief synopsis of each tool's applicability and an indication of where in the book it is described. The Timeline for Application of Lean Design Tools suggests the periods within a typical product development process during which each tool would be most beneficial. Naturally, your situation may be different from the "typical." Hence, these tools are designed to be flexible, scalable, and easily adaptable. I'll be providing hints on how to tailor them to your specific needs at every stop along the way.

Welcome to the world of lean design. I hope you enjoy your intellectual journey, but make no mistake: Your travels will be wasted if you don't commit yourself to *putting the tools you've learned to work!*

Lean Design Tool Quick-Reference Guide		
Lean Design Tool	Overview	Section
<i>Product Opportunity Ranking Tool</i>	Enables rapid prioritization of new product opportunities.	1.4
<i>Target Costing</i>	Establishes a clear cost target for design teams early in development.	1.5
<i>Twenty-Cost-Lever Tradeoff Tool</i>	Tradeoff tool for comparing potential cost-reduction design alternatives.	1.6
<i>Lean QFD</i>	Method for capturing the “voice of the customer” with minimal time and effort.	2.1
<i>Must / Should / Could Prioritization</i>	Technique for the priority ranking of product specifications and features.	2.2
<i>Product-Line Optimization Team</i>	An ad hoc team dedicated to identifying cross-product-line cost-savings.	3.1
<i>Product-Line Roadmap</i>	A visualization tool that displays future line extensions, opportunities, etc.	3.1
<i>Platform Plan</i>	A project plan for implementing platform-based cost-saving initiatives.	3.2
<i>Module-Optimization Checklist</i>	Provides development teams with a way to optimize their platform designs.	3.3
<i>Quick-Look Value Engineering Event</i>	Powerful tool for identifying and screening possible low-cost design options.	4.2
<i>Pugh Method for Concept Selection</i>	A quick and easy method for evaluating several product design concepts.	4.3
<i>Lean Design Challenge</i>	Harnesses the “smarts” of an entire organization to solve cost problems.	4.3
<i>“How’s it Built?” Review</i>	A producibility review that brings together product and process designers.	5.3
<i>“Seven-Alternatives” Process</i>	Optimizes capital investment by considering multiple process alternatives.	5.4
<i>Cost-of-Poor-Quality Calculator</i>	A template for calculating the benefits of increasing process “capability.”	6.2
<i>Six-Sigma Cost-Reduction Guide</i>	Overview of Six-Sigma Design tools with a focus on their cost-saving impact.	6.2
<i>Design “Best-Practice” Guideline</i>	Template for capturing successful design techniques and cost-saving rules.	6.3
<i>Lean Design “Maturity Model”</i>	A guide to the staged implementation of lean design tools within a firm.	6.4

Timeline for Application of Lean Design Tools						
Lean Design Tool	Project Selection	Conceptual Design	Concept Validation	Detailed Design	Qualification & Pilot Mfg.	Production Launch
Product Opportunity Ranking Tool	█	█				
Target Costing	█	█	█	█	█	█
Twenty-Cost-Lever Tradeoff Tool	█	█	█	█	█	█
Lean QFD		█	█	█		
Must / Should / Could Prioritization		█	█	█		
Product-Line Optimization Team	█	█	█	█	█	█
Product-Line Roadmap	█	█	█	█	█	█
Platform Plan	█	█	█	█	█	█
Module-Optimization Checklist		█	█	█	█	█
Quick-Look Value Engineering Event		█	█	█	█	█
Pugh Method for Concept Selection		█	█	█	█	█
Lean Design Challenge		█	█	█	█	█
"How's it Built?" Review		█	█	█	█	█
"Seven-Alternatives" Process		█	█	█	█	█
Cost-of-Poor-Quality Calculator		█	█	█	█	█
Six-Sigma Cost-Reduction Guide		█	█	█	█	█
Design "Best-Practice" Guideline		█	█	█	█	█
Lean Design "Maturity Model"		█	█	█	█	█