## **Contents**

Foreword to the Second Edition	V
Introduction: The Author and His Work	1
About the Author	3
Why We're Publishing This Book	5
The Foundations of Lean Product and Process Development	7
Invitation to Read On	11
Chapter 1: Purpose	13
The Basic Secret	14
The System, and How I Learned It	16
Why You Need this Book	17
How this Book is Organized	19
Chapter 2: Value and Performance	21
Producing Profitable Operational Value Streams	22
Project Performance	23
Project Return on Investment	24
Market-share Change	26
Project Defects	27
Focusing on Creating Usable Knowledge	31
Out-learning the competition	34
Cycle Time from Concept through Simulation and Test Results	34
Knowledge Grade and Rate of Change	35
Lead Time between Technical or Market Opportunity and	36
Full-rate Production of a Winning Product	
Summary: The Learning-to-Costs Ratio	39
Chapter 3: Seeing Waste in Development	41
Scatter	44
Barriers to Communication	47
Poor tools	49
Hand-off	51
Useless Information	56
Waiting	58

Wishful Thinking	61
Testing to Specifications	63
Discarded Knowledge	65
Timeline Maps Help See the Wastes	67
Lessons Learned so Far	69
Chapter 4: Seeing the Future	71
Focusing on Creating Value	74
The Fundamental Value-creating Cycle	75
Lean Design is System Design	82
The Value Stream Must 'Line-up'	84
Aligning the Business to Manage Two Flows	87
Designing Manufacturing Systems	92
'Design-in' Suppliers Add Knowledge-value	95
Value Focus Pulls the System	102
Chapter 5: Lead with Entrepreneur System Designers	103
The Psychology of Organizational Tension	108
Picking and Developing Lean Project and Business Leaders	113
What Would You Do if It were Yours?	117
Representing Customers	118
Negotiating for Resources, Agreeing on the Vision	119
Taking Responsibility for Profit and Risk	124
Designing the System	126
Chapter 6: Set-based Innovation	133
Why Conventional Development Doesn't Work	134
Why SBCE Works	136
Why and When to Explore Broadly	140
Simple Models, Independent Innovation, Aggressive Elimination	149
Trade-off Curves	153
Convergence and Negotiation	162
Specification Emergence	165
Classifying Projects: SBCE and the Project Portfolio	168
Summary	177

Chapter 7: Manage Turbulence through Cadence, Flow, and Pull	179
The Problem with Conventional Project Management	181
Understand the Current State	184
Integrating Events	187
Establishing a Project Cadence	193
Quick Cycles: Pull and Flow of Small Knowledge Batches	201
Capacity Planning	211
Individual Resource Cycles	212
Information Pull	215
Putting it All Together	224
Chapter 8: Build Teams of Responsible Experts	225
The Behaviors: Responsibility, Teamwork, and Expertise	227
Value-creating, Flow-supporting Management	228
Knowledge Management and Continual Improvement	234
Leadership for Effective Discipline	235
Efficient, Effective Communications	237
Personnel Management for Expertise and Responsibility	244
'It's a system for grownups'	249
The Final Analysis	253
Chapter 9: Starting the Change	255
From the Gemba	259
Case 1: Scania's R&D Factory: A Case of Lean Product Development	261
Case 2: Deploying Lean Product Development Practices at Ford Body, Safety, and Stamping Engineering	280
Case 3: The PING Story: Increasing R&D Throughput by Applying Lean Principles	297
Case 4: Lean Product Development Initiative at Goodyear Tire and Rubber Company	306
Case 5: The Joy of Lean Innovation: A Case Study of Menlo Innovations	318
Acknowledgements	331
Endnotes	333
Index	340