

GLOBAL INNOVATION MANAGEMENT

SECOND EDITION

J. CHRISTOPHER WESTLAND

GLOBAL INNOVATION MANAGEMENT

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2nd edition

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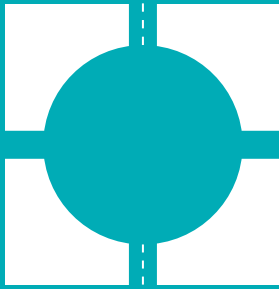
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BRIEF CONTENTS

PART 1: INTERNAL COMPONENTS OF INNOVATION	7
1 Innovation, Globalization and Commoditization	9
2 Components of an Innovation	31
3 Business Models and Strategy	54
4 Service Innovations	80
5 Marketing and Logistic Channel Management	112
6 Entrance Strategies – Choosing your Competitive Arena	133
 PART 2: EXTERNAL FACTORS IN INNOVATION	 161
7 Protecting Your Innovations	163
8 Technology Dynamics and Disruptive Innovation	190
9 Financing and Valuation of Innovations	215
 PART 3: SOCIAL AND TECHNOLOGICAL ECOSYSTEMS OF INNOVATION	 247
10 Emerging Platforms for Innovation	249
11 Understanding and Managing Creative People	275
12 Communities, Networks and Reputation	300
13 Society, Government and Innovation	320

CONTENTS

List of Figures	xiii
List of Tables	xvii
Boxes	xxi
Preface	xxvii
Tour of Book	xxx

Letter to Students from the Author of <i>Global Innovation Management</i>	1
--	----------

Letter to Instructors from the Author of <i>Global Innovation Management</i>	3
---	----------

Topic Clusters in Global Innovation Management	4
--	---

The Role of the Innovation Workout	6
------------------------------------	---

PART 1: INTERNAL COMPONENTS OF INNOVATION	7
--	----------

An Introduction to Part 1	8
---------------------------	---

Chapter 1 Innovation, Globalization and Commoditization	9
--	----------

Learning Objectives	9
---------------------	---

Innovation	10
------------	----

What is Innovation?	11
---------------------	----

Innovation for Marketability: Features, Constraints and Figures of Merit	14
--	----

When do you have an 'Innovation'?	16
-----------------------------------	----

The Twin Challenges of Globalization and Commoditization	16
--	----

Thinking like an Innovator	18
----------------------------	----

Making Innovations Profitable	19
-------------------------------	----

Chapter 1 Innovation Workout: Reversing Assumptions	20
---	----

Case Study: Alibaba	23
---------------------	----

Chapter 1: Questions for Review	29
---------------------------------	----

Chapter 1: Key Points	29
-----------------------	----

Further Reading	29
-----------------	----

Chapter 2 Components of an Innovation	31
--	-----------

Learning Objectives	31
---------------------	----

Innovation Ecosystem: Introducing the Innovation Analysis Toolkit	32
---	----

The Structure of an Innovation	32
--------------------------------	----

The Mystery of Demand	33
-----------------------	----

Exploring the Potential Demand of Customers for an Innovation	36
---	----

Consumption Chains: Bridging the Gap from Producer to Customer	39
--	----

The Feature Map	41
-----------------	----

Creative Tension	44
------------------	----

Chapter 2 Innovation Workout: Brainstorming: A Framework for Quizzing	45
---	----

Variations	47
------------	----

Workout: Organizing your Quizzing with Mind Maps	48
--	----

Case Study: Viagra – The First Blockbuster Drug	49
---	----

Chapter 2: Questions for Review	52
---------------------------------	----

Chapter 2: Key Points	52
-----------------------	----

Further Reading	52
-----------------	----

Chapter 3 Business Models and Strategy	54
---	-----------

Learning Objectives	54
---------------------	----

Business Models	55
-----------------	----

Capabilities in the Business Model	57
Storytelling	63
Tying Narrative to Numbers	65
Finding an Innovation's Value Proposition	66
Value Maps	66
Internet Business Models	68
Chapter 3 Innovation Workout: Morphological Boxes	71
Case Study: Mad Catz Interactive, Inc.	74
Chapter 3: Key Points	77
Note	77
Further Reading	77
Chapter 4 Service Innovations	80
Learning Objectives	80
Service Innovation	81
Container Services: The Logistics Revolution	83
Crowdsourcing and Internet of Things	85
Circular Supply Chains	86
Consumer Education, Warranty and After-Market Services	88
Express Mail	90
Hybrid Internet/Brick-and-Mortar Retailing in Hong Kong	92
Financial Services	93
Original Equipment Manufacturing Services	99
Innovation at the Margins of Society	101
Call Centre Services	102
Chapter 4 Innovation Workout: John Sterman's Beer Game	105
Case Study: The Identity Crisis of Amazon	105
Chapter 4 – Questions for Review	110
Chapter 4: Key Points	110
Further Reading	110
Chapter 5 Marketing and Logistic Channel Management	112
Learning Objectives	112
Channels	113
Modelling the Channel	115
Scientific Channel Management	117
Chapter 5 Innovation Workout: Feature Segmentation	126
Case Study: Paxil – 'Mind Mapping' the Mind	127
Chapter 5: Questions for Review	131
Chapter 5: Key Points	131
Further Reading	131
Chapter 6 Entrance Strategies – Choosing your Competitive Arena	133
Learning Objectives	133
Assessing the Competitive Terrain for an Innovation	134
Analysing your Current Business Portfolio	136
Competitive Options	137
When to Use Options Strategies	145
Adaptive Execution	147
The Most Important Sales Are Your First Three Sales	147

Lead-Steer Customers	148
Competitive Response	150
Chapter 6 Innovation Workout: Force-Field Analysis	153
Case Study: Triumph and Victory Enter the Market	154
Chapter 6: Key Points	159
Note	159
Further Reading	159
PART 2: EXTERNAL FACTORS IN INNOVATION	161
An Introduction to Part 2	162
Chapter 7 Protecting Your Innovations	163
Learning Objectives	163
Laws	164
Ethics	164
Intellectual Property Law	167
Patents	173
Copyrights	176
Trademarks and Other Commercial Identifiers	178
Trade Secrets	179
Other Contractual IP Rights	179
Open Innovation	179
Thinking Strategically about IP	181
Chapter 7 Innovation Workout: Computing your Risk for Keeping a Secret	182
Case Study: The Anatomy of a Utility Patent	183
Chapter 7: Questions for Review	188
Chapter 7 – Key Points	188
Further Reading	188
Chapter 8 Technology Dynamics and Disruptive Innovation	190
Learning Objectives	190
The Dynamics of Innovation	191
Technology Acceleration	191
Disruptive Innovation	192
Organizational Scaling	200
Geographical Scaling	203
Consequences of Geographical Scaling	205
Alliances	205
Chapter 8 Innovation Workout: Visualization	206
Case Study: Yamaha Piano	207
Chapter 8 – Key Points	213
Notes	213
Further Reading	213
Chapter 9 Financing and Valuation of Innovations	215
Learning Objectives	215
Two Markets	216
Sources of Financing	217
Return on Investment	220

The Role of Financial Analysis and the Market	222
Strategy Drivers and Figures of Merit	224
Return on Investment	225
Accounting and Auditing for Information-Intensive Innovations	226
Big Data	228
Sales Revenue as a Strategy Driver	230
Strategy Models	231
The Cost of Money	239
Chapter 9 Innovation Workout: Scenario Analysis	239
Case Study: Behavioural and Strategy Models in the Early Years of eBay	241
Chapter 9: Questions for Review	244
Chapter 9 – Key Points	244
Further Reading	244
PART 3: SOCIAL AND TECHNOLOGICAL ECOSYSTEMS OF INNOVATION	247
An Introduction to Part 3	248
Chapter 10 Emerging Platforms for Innovation	249
Learning Objectives	249
Emerging Competitive Platforms	250
The Internet of Things	250
Intellectual Property Winners and Losers	251
Biotechnology	253
The Business of Selling a New Technology	254
Business Models in an Era of Smart Objects	255
Event-Driven Business Models	255
Cloud Computing, Large Datasets and Cloud Supercomputing	256
IoT for the Masses: Arduino and Raspberry Pi	259
Chapter 10 Innovation Workout: Advertising with Keywords	259
Case Study: Da-Jiang Innovations	261
Chapter 10 – Key Points	274
Further Reading	274
Chapter 11 Understanding and Managing Creative People	275
Learning Objectives	275
Types of Creative People	276
How Successful Technology Companies Manage Creative Teams	276
Creative Minds	279
Traits of Creative People	283
Traits of Creative Societies	287
Chapter 11 Innovation Workout: The Innovation Audit	288
The Innovation Audit Scorecard	292
Case Study: The Perils and Pitfalls of Managing Creative Artists	293
Chapter 11 – Key Points	297
Further Reading	297
Chapter 12 Communities, Networks and Reputation	300
Learning Objectives	300
Network Effects	301

Value Drivers in Network Economics	306
Standards, Lock-in and Critical Mass	306
Social Networks in the City	307
Brands and Reputation	308
Chapter 12 Innovation Workout: Inductive Reasoning in Brand Development	312
Case Study: The Craigslist Network	315
Chapter 12: Questions for Review	318
Chapter 12 – Key Points	318
Further Reading	318
Chapter 13 Society, Government and Innovation	320
Learning Objectives	320
The Innovation Society	321
Innovation's Role in Economics	321
Sustainability	324
Energy	324
Greenhouse Gases	325
Water	326
Food	326
Industrial Materials	326
National Innovation Systems	326
Technology, Talent and Tolerance	331
Chapter 13 Innovation Workout: Putting it All Together (with a Digression on 'The Blues')	335
Thinking About the Problem: A Potential Innovation	337
Case Study: Meade Reaches for the Stars	339
Chapter 13: Questions for Review	343
Chapter 13 – Key Points	343
Notes	343
Further Reading	343
Index	347

LIST OF FIGURES

2.1	Tools for Assessment of Potential Customer Demand	37
2.2	Mismatch of Markets and Competences	38
2.3	Customer Consumption Chain for an Automobile Purchase	40
2.4	An Example of a Consumption Chain for DJI's Phantom Quadcopter Drones, Showing the Reasons That Sales Might Be Lost When a Customer Leaves the Consumption Chain	41
3.1	Mismatch of Markets and Competences	57
3.2	Innovators Compete in a Multitude of Evolving Markets	58
3.3	Evolution of the Market for a Particular Product Innovation, and the Demands on your Capabilities	59
3.4	Evolution of the Trajectories of Firm Capabilities as Particular Technologies and Competences are Preserved or Grow Obsolete due to Market Forces	60
3.5	The Four Evolutionary Paths of Innovation in a Company's Products	63
3.6	The Value Proposition for the Innovation	66
3.7	Mad Catz' Value Map	75
4.1	Rise of the Service Economy	81
4.2	Consumption Chain for Container Services	85
4.3	Consumption Chain for Hobbyist Microcontroller	86
4.4	Consumption Chain for Circular Supply Chains	88
4.5	Consumption Chain for Consumer Education, Warranty and After-market Services	90
4.6	Consumption Chain for Express Mail	92
4.7	Consumption Chain for Customer Service	94
4.8	The Rise of the Megabanks	94
4.9	US Bank Market Share in 2005	95
4.10	US Share of Assets Held by the Largest Banks	96
4.11	Features and Components of the Collateralized Mortgage Obligations Market that were a Major Factor in the 2008 Market Crash	97
4.12	US Bank Securities Holdings and Profitability	98
4.13	Consumption Chain for the CDO and CDS Markets from a Banking Perspective	99
4.14	Consumption Chain for Customer Service	101
4.15	Call Centre Performance	103
4.16	Consumption Chain for Call Centre Services	104
5.1	Customer Consumption Chain for an Automobile Purchase	115
5.2	Resource-based View of Strategy	122
6.1	Strategic Migration of Capabilities in Pursuit of Markets	134
6.2	Project Options in Technology–Operations and Market Space	145
6.3	Example of Projects (Alpha, Beta etc.) Mapped in Technology–Operations and Market Space	146

6.4	US Motorcycle Sales (000s) of 600cc and Above	154
6.5	Motorcycle Power to Weight	155
7.1	Patents Filed since 1800	167
7.2	Distribution of Qualcomm's 21,500 patents by Technology Category	170
7.3	Hitachi's Income/Expense Ratio for its Patent Operation (1970–2000)	175
7.4	Relative Risk of Various Factors Involved in Keeping a Secret	182
7.5	Relative Risk Scorecard	183
7.6	Patent Application Sample Drawing	186
8.1	Motorcycle Power (Compared to Exponential Trendline for 2.1% Annual Growth)	194
8.2	Labour Cost of Light	195
8.3	Technology Acceleration Across a Series of Technology Platforms	196
8.4	How Disruptive Innovation Comes About	197
8.5	Advances in Hard Disks Open up New Markets	198
8.6	Technology Acceleration in Internet Download Speed Opens up New Markets	198
8.7	Excavator Bucket Size and Markets	199
8.8	Rogers' 'Adoption of Innovation' Trajectory, with Key Events and Consumer Groups in a Product's Life Cycle	202
8.9	Curve for Innovation A	202
8.10	Sequence of S-Curves	203
8.11	Travel (Top) and Communication (Bottom) Times from New York to Boston (in Minutes)	204
8.12	Thomas Edison's Sketch Thinking Through the Circuit for Energizing a Discharge Tube	206
8.13	Technology Acceleration at Yamaha	211
9.1	Number of Projects 'Kickstarted' as of December 2015	218
9.2	Projects' Success Rate by Category as of December 2015	219
9.3	Project Money Successfully Raised by Category on Kickstarter as of December 2015	219
9.4	The Reporting-Control Cycle	223
9.5	What is Most Important in Firms' Decisions	224
9.6	$\frac{\text{Stock market capitalization}}{\text{Accounting book value}}$ for 8 of 10 Largest Companies in the Fortune 500	227
9.7	The Role of Intangibles and Knowledge in Various Industries	228
9.8	Firms with Smaller Fixed Asset Investment Have Been More Profitable c.2016	228
9.9	Data Volumes and the Era of Big Data	229
9.10	Sales Maximization vs. Profit Maximization	230
9.11	Components of the Strategy Model	232
9.12	MySpace vs. Facebook	233
9.13	Shannon's Model of Information	234
9.14	Option with Three Possibilities	236

9.15	Option with Two Possibilities	236
9.16	Various Methods of Valuation	237
9.17	Value Cone of the Business Model	238
9.18	A 'Safe' Low-Return Investment vs. a 'Risky' Higher-Return Investment	238
9.19	Scenarios: Each of These Scenarios Points to Different Actions you Might Take, and Different Business Opportunities	240
9.20	Figures of Merit, with Future Projections, for eBay	242
9.21	eBay Users and Listings Per Year	242
10.1	The Cost of Sequencing a Genome	254
10.2	Generic Model for Internet of Things (IoT) Applications	255
10.3	Creativity Index and Economic Output (2015)	257
11.1	A Report Card of the Firm's Innovation Performance for a Particular Product	293
12.1	Radial Tree Diagram of a Network	302
12.2	Random Networks (Italian Highways)	304
12.3	Small-World Networks Tend to Have a Few Close Contacts, and a Few Nodes that Stretch Their Contacts Across the Whole Network (In Social Networks, These will be the Most Widely 'Networked' People in a Crowd)	304
12.4	Italian Air Traffic (Scale-Free Network With a Power Law Distribution of Links)	305
12.5	Strong and Weak Social Links	305
13.1	Historical Structure of US Job Market	321
13.2	R&D Spending in the US (1950–2010 est.)	331
13.3	The Most Creative Countries in the World	332
13.4	Blues Scale	336
13.5	Redesign of Piano Keyboard for Easy Transposition and Greater Reach (5½ Octaves)	337
13.6	C, C# & F# Major Scales on a Standard Piano Keyboard and on the Tiered Keyboard of Figure 13.5	338

LIST OF TABLES

2.1	The Demand-side Feature Map	42
2.2	The Supply-side Feature Map	43
2.3	Demand-side Feature Map for the DJI Phantom's Plastic Shell and Battery	44
2.4	Supply-side Feature Map for the DJI Phantom's Plastic Shell and Battery	44
3.1	Internet Business Models	69
3.2	Morphological Box for Video Game Console Design	72
3.3	A Particular Video Game Console Design	72
3.4	Morphological Box with Willingness-to-Pay and Cost Data for Video Game Console Design	73
3.5	Profit-Maximizing Design of a Video Game Console Design	73
3.6	Value and Cost Generated by Game Controller Components	75
3.7	Feature Map of Game Controller	76
4.1	Demand-side Feature Map for Container Services	84
4.2	Supply-side Feature Map for Container Services	85
4.3	Demand-side Feature Map for Hobbyist Microcontroller	86
4.4	Supply-side Feature Map for Hobbyist Microcontroller	86
4.5	Demand-side Feature Map for Circular Supply Chains	87
4.6	Supply-side Feature Map for Circular Supply Chains	87
4.7	Demand-side Feature Map for Consumer Education, Warranty and After-market Services	90
4.8	Supply-side Feature Map for Consumer Education, Warranty and After-market Services	90
4.9	Demand-side Feature Map for Express Mail	91
4.10	Supply-side Feature Map for Express Mail	91
4.11	7-Eleven (Hong Kong) Hybrid Internet/Brick-and-mortar Services	93
4.12	Demand-side Feature Map for Customer Service	93
4.13	Supply-side Feature Map for Customer Service	93
4.14	Demand-side Feature Map for the CDO and CDS Markets from a Banking Perspective	98
4.15	Supply-side Feature Map for the CDO and CDS Markets from a Banking Perspective	99
4.16	Demand-Side Feature Map for the Peabody Phone	100
4.17	Supply-side Feature Map for the Peabody Phone	101
4.18	Demand-side Feature Map for Call Centre Services	104
4.19	Supply-side Feature Map for Call Centre Services	104
4.20	Amazon vs. Barnes & Noble	106
5.1	Demand-side Feature Map for the 'Awareness' Service on the Automobile Purchase Consumption Chain	116
5.2	Supply-side Feature Map for the 'Awareness' Service on the Automobile Purchase Consumption Chain	116

6.1	Business Segment Portfolio Ranking	136
6.2	Specifications c.2015 of DJI and 3DR Drones	143
6.3	Feature Map for the Phantom 3	143
6.4	Feature Map for the 3DR Solo	144
6.5	Feature Map for the 3DR ‘Hobbyist and Mapping’ Products Iris+, X8+, Y6	144
6.6	Prospects and Strategies for Initial Sales	150
6.7	When Investing to Gain First-mover Advantage is Strategically Justified	152
6.8	Target Market for Triumph Motorcycles	156
7.1	The 25 Most Innovative Countries by Patents Filed 1990–2013 (in 000s)	168
7.2	International Patent Applications by Country	169
8.1	Microcomputer Technology Acceleration	193
8.2	Technology Acceleration in the Motorcycle Industry, 1950–2001	194
10.1	30 Technology Areas with the Most Patent Filings (1994–2014), Ranked by Rate of Growth of Patent Filings	252
12.1	Social Activities as an Exponential Function $[N(t)]^\beta$ of City Size $N(t)$	308
12.2	Brand Value	314
13.1	David Stokes’ Taxonomy of Research	330

BOXES

Box	Country	Page No.
Chapter 1:		
Innovation: It's Not Always New, But It's No Longer Optional	Global	10
An American in Beijing (Part 1)	China	12
How Innovation Impacts Consumer Prices	US	13
An American in Beijing (Part 2)	China	13
Outsourcing Non-Core Tasks and Globalization	China, US	14
Apple's Chief Designer on Innovation	US, UK	15
An American in Beijing (Part 3)	China	16
Waves of Innovation	Russia, US	17
The Shift from Research to Development	US	18
An American in Beijing (Part 4)	China	20
Chapter 2:		
Fender's Tube Amplifiers: Innovating by Redifferentiating and Remarketing a Winning Sound	US	35
Crowdsourcing Ideas	Netherlands, France, Spain	36
Quizzing	Global, India	38
The Enabler	Global	42
Chapter 3:		
Beam me up	US	55
What's in a Name? (Part 1)	US	55
What's in a Name? (Part 2)	US	56
Business Strategy	US	57
Sony's Batteries	Japan	59
Buying Competence at Cisco	US	61
The Prophet of Post-Industrialism	US	63
Numbers Guys	US	64
Coca-Cola finds that Competitors can be Devious	US	65
Thematic Maps	Global, UK	67

Box	Country	Page No.
1884: The Measurement Crisis in Geographical Mapmaking	France, UK	67
Minnesota Mining and Manufacturing's Quest for a Viable Value Map	US	68
Chapter 4:		
The Long Tail	Global	88
Chapter 5:		
The Pirates of Istanbul	Turkey	113
The Elephant in the Drawing Room	UK	119
Vacuum Tubes: The Market for Niche Innovations	UK, Global, US	122
The Prototype Database	Japan	124
Parable of the Fish	US	125
Chapter 6:		
The 'Mighty Wurlitzer'	UK, US	135
Selling the Potato	Germany, UK	137
The Father of Sudoku	Japan	138
Genghis Khan's Entrance Strategy	Asia, China	140
Mini-case on Stepping-stone Options: Open-source Development vs. Proprietary Technology: The Case of 3D Robotics	Hong Kong, China	142
Unilever Discovers that its Lead-Steer Customers Do Not Care About Health	UK	148
Unilever Gets its Lead-Steer Customers to Care about Health	UK	149
Competitive Tactics	Global, US	151
First-mover Advantage	US	152
Progressive	US	152
Chapter 7:		
Stealing the Whole Company	China	166
The Enigma	Germany	166
The First Patents	UK	167

Box	Country	Page No.
Qualcomm's CDMA Patent	US	169
Gemstar's Aggressive Patent Strategy	China, US	170
The Origin of Copyrights	UK	171
Standards Wars	US	172
Hitachi's Evolving Patent Strategy	Japan	173
The Selden Patent	US	175
Jeff Bezos and 'One-click'	US	176
It's a Wonderful Life	US	176
The Bebop Alternative	US	177
Shifting Time and Space	Japan, US	178
Secret Ingredients	US	179
Chapter 8:		
Moore's Law	US	191
Technology Acceleration in Microcomputer Hardware	China	193
Motorcycle Technology Acceleration	UK, Japan, US	193
Cost of Light	Global	195
Dell's War on Inventory and Property	US	196
Disk Drives Become too Small for Human Production	Asia, China	200
New York and Boston get Cosy	US	203
Chapter 9:		
Crowdfunding the Creative Arts	US	218
Rocket Science and the Reachability of Goals	US	223
Strategy Drivers	Global	224
Figures of Merit: Shigeru Miyamoto's <i>Wife-o-meter</i>	Japan	225
Information Assets	Global	226
Gaming the Research Strategy Drivers	US, UK	229
IBM and the Automation of Accounting	US	231

Box	Country	Page No.
Case Study: MySpace's Market Entry and Decline	UK, US	232
How Much Information is in a Dataset?	Global	234
Strategy Model: Facebook	US	235
Valuing a Real Option	Global	236
Chapter 10:		
Tim O'Reilly on the Internet of Things	Ireland, US	258
Chapter 11:		
Peter Drucker's 'Knowledge Workers'	Global, US	276
Office Cubicles	US	280
Industry Standards and the Invention of the Light Bulb	Germany, UK, US	281
Einstein's Brain	US	282
Discovers	Global	283
3M	US	284
Unitech Networks, Hong Kong	Hong Kong	285
40 Lives in Bebop	US	286
Open Source Software	Finland	288
Chapter 12:		
The First Network Bubble	US, UK	301
Electrical Standards	US	302
Natural Monopolies	US	303
The Networking Family	US	303
Myths About Public Goods, Externalities and Lock-in	Global	306
Patagonia's 'Green' Credentials	US	309
Procter and Gamble's Brand Equity	US	310
The Politics of Innovation	Global	310
Buying the Research	Asia	311
Chapter 13:		
The Rise of the Innovators	US	321
Adam Smith's Pin Factory	UK	322

Box	Country	Page No.
Virtual Economies	Global	323
The Economics of Alternate Realities	Global	323
Oil: The 19th-Century 'Green' Technology	UK, US	324
Léon Theremin	Russia, US	327
Hong Kong's Cyberport: A Cautionary Tale about Economic Clusters and National Innovation Systems	Hong Kong	328
Motivating Innovation	Global	330
The Most Creative Nations	Global	331
Dublin: Building the High-Tech Mecca	Ireland	333
Asia Innovates	Asia	334

PREFACE

This second edition of *Global Innovation Management* updates materials I have been using in classes taught at Hong Kong University of Science and Technology, University of Illinois – Chicago, the Vietnam EMBA and the University of Science and Technology in China. It addresses a question that I have encountered for at least a decade now: ‘If you think you have invented a winning innovation, how can you bring your innovation out of the laboratory and turn it into a commercially successful product?’ It is a question that comes up often today, in all areas of industry. The question crosses many disciplines, and is one that I wish were pursued more actively in business schools.

Nearly three decades ago Michael Porter suggested that innovation should be seen as a combination of invention and commercialization, reflecting received wisdom in both industry and academe. There are many books on the market that address innovation, the largest number being devoted to the first half of this combination – how to be inventive. Topics range from systems for helping people to be more creative to better managing laboratories and generating ideas. Clearly these activities must predicate any commercial successes in the market. They are necessary but not sufficient. The second half of the combination has received less attention; though there are several good books on commercialization of innovations, the study it has received has been incomplete.

Existing books in the market that address innovation tend to fall into three categories: (1) behavioural texts on how to be more creative; (2) industrial design and research and development (R&D) management books; and (3) industrial organization books that study the sources and influence of innovation. This book is intended to fill a slightly different niche – at once pragmatic, yet supported by field research and theory. It concerns the process of being a successful innovator. It is part history, part theory and part practical guide to the myriad tasks involved in innovating for a living. I hope it will find an audience with inventors, not just in labs but in market channels and in service industries, who want to turn their ideas into profitable and sustainable businesses.

It was my goal, in writing this text, to address the management of each major task on the path from idea creation to successful commercialization of an innovation. Creativity is addressed, in Chapter 11, mainly as a primer on identifying creative people and helping them to achieve their potential. I am biased in believing that, even though everyone can learn to be more creative, only a small percentage of the population is good enough to generate commercially useful innovations. These ‘creative types’ can be temperamentally idiosyncratic and require special handling.

Many of the other tasks in innovation parallel the concerns of entrepreneurs, but with substantially less historical information about how to structure your business models, and substantially more uncertainty about products and customers. Variations in traditional management required of innovations constitute the main body of this text.

Finally, I spend time answering the question ‘Why bother?’ It is not uncommon to encounter objections to the myriad difficulties entailed in high-tech and high-innovation businesses with suggestions that the firm would be better served by ‘sticking to its knitting’, so to speak, and only engaging in traditional, well-understood business activities. Unfortunately, globalization and the rise of internet business have moved many such ‘traditional’ industries to places where labour costs are low, environmental standards lax and factory scales huge. It has commoditized them, making it difficult for new entrants or small operations to compete even if they wanted to. The greatest profits today are to be made in areas with high technological and business risk.

I have avoided the overuse of the term ‘technology’ throughout this book, though many of our most successful innovations – automobiles, televisions, music players, airplanes, refrigerators and so forth – have succeeded only long after all of the detailed technological components were well understood and developed. The technology is too often out there in the lab, waiting for the right ‘formula’ to make it attractive to a wider consumer base. This book assumes that the raw technological components are already with us, just waiting to be plucked from the laboratory, or to be searched on Google Patent Search or called up over lunch

with our engineering staff. Or it assumes that you've already identified your technology (maybe you've been hovering over it in your lab for the past two years) and you now want to figure out what next. Or that you are a salesperson, or product designer or hold any one of a number of other jobs in the firm that need to keep seeking the next big thing. The question arises as to how to manage all of the parts of a successful – with the emphasis on successful – design, development, introduction, sale and promotion of an innovation. In my system, technology is just one of the many components that have to be grafted into the overall innovation for success.

In my classes, I make use of a substantial amount of material that is not included in the text, but rather is available from the companion website to this book. The website allows me to continually update material, as well as provide supplemental presentation slides and exercises for in-class usage. It also provides a server platform for software programs which support the text. Server-based software provides me with greater latitude in my offerings than would a CD of software. First, it is much easier to programme a user interface as a web page than as a stand alone shell (and also gives me the fallback, in case of programming errors, of quickly correcting the interface). Second, I can compute user input with powerful software on the server (e.g. MatLab) that would be infeasible and expensive to implement in standalone support programmes. Finally, there are fewer copyright problems in placing material on a web page because they can be linked to a broad range of sources that can be tapped to help solve a problem, complete a plan or update your current knowledge. Where intellectual property issues do crop up, they can be resolved quickly. I believe the combination of a printed textbook – which is portable, easy to read, annotatable and easy to search – in combination with a supplementary web page – which can include updates, classroom materials and software – offers the best of both worlds. Visit www.macmillanihe.com/companion/westland-gim-2e for online resources.

This book is designed to be used as a textbook in a one- or two-semester class on innovation, in an engineering programme, business programme

or other science programme. There are 13 chapters, which fit with a 14-week semester. I teach my courses in two 7-week sessions. The second semester tends to overwhelmingly focus on financial analysis, as both investment bankers and corporate managers are quite interested in this aspect of innovation.

This text is divided into three sections covering specific topical clusters:

Internal components needed for successful innovation: this cluster of chapters presents the 'building blocks' of innovation. Here an innovation is not a product or service – rather it is a market niche defined by the customer's own needs, problems and willingness to trade money for solutions, recognizing that every innovation must ultimately be sold in a competitive market.

External factors in commercializing an innovation: intellectual property laws, disruptive innovation, technology acceleration and the competition for venture capital and finance are all important for successful innovation, but are only partly under the control of the innovator.

Social and technological ecosystems in which innovation thrives: emerging platforms such as robotics, autonomous vehicles, smart devices and artificial intelligence expand the innovator's palette while introducing risk. These in turn will evolve in a context of the individual, community and society which is rapidly moving us towards a creativity-based economy.

Because of the breadth of topics covered in this text, each chapter is intended to present the main ideas and components and their use and relevance to the innovation process. At the end of each chapter, I provide references and further reading that fills in the details that are needed for a practical implementation. You need to get the 'big picture' first, and then go back and start filling in details, especially since the details are likely to be different for every invention, every market and every project.

J. Christopher Westland

TOUR OF THE BOOK

Learning Objectives

After finishing this chapter, you will

Understand why innovation is no longer optional, but a necessary activity in every competitive business.

Understand the difference between innovation, invention, creativity and commercialization.

Understand the forces of globalization and commoditization, and identify their causes.

Identify opportunities for innovation in industries undergoing consolidation and commoditization.

Understand that only innovations that ultimately will be profitable are of interest to firms.

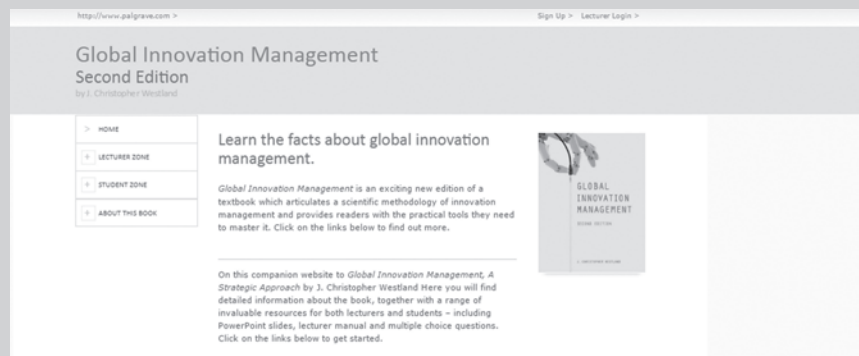
Understand the components of innovation.

Learning objectives

To identify the key concepts covered in the chapter, and the knowledge and skills that students will gain. Separate objectives are provided for the innovation workouts and full case studies.

Companion website

PowerPoint slides, revision questions and other support material all available at:



Innovation Workout: Brainstorming: A Framework for Quizzing

Alex Faickney Osborn was the 'O' in the name of advertising giant BBDO, and the developer of arguably BBDO's greatest product – brainstorming. It was used internally at BBDO for over a decade before Osborn outlined the method in his 1942 book *How To Think Up*. The method inspired Olaf Helmer's development of the Delphi Method in the early 1950s at the RAND Corporation, involving the repeated collection and distribution of the judgements and opinions of individual experts through the exchange of written documents or electronic mail.

Innovation workouts

Included in each chapter, the Innovation Workouts introduce techniques that can be used to hone your innovation skills, and give examples on how to use them.

Full case study

Each chapter includes a long case study on real-life business applications, from a wide range of international companies, to show how the theory of each chapter is applied in the real world.

Case Study:

Alibaba

Ma Yun is a one-time English teacher born in rural China to traditional musician-story-tellers. Early on Ma adopted the English name 'Jack'. Jack ultimately moved on to become one of the richest men in China, and one of the most successful entrepreneurs in the world. He started with the simple idea of setting up an electronic message board for small business people in China and around the world to exchange trading information. To grab market share, Ma allowed users to access the service for free. Jack Ma called his business Alibaba, after the hero in one of the *One Thousand and One Nights* stories.

Alibaba.com grew fast, quickly dominating his largest competitors; but Jack Ma's 'free' strategy almost bankrupted him in the beginning. Ma was born in 1964 just before the

Case study questions

At the end of each case study, questions to review the case study encourage students to explore the issues raised.

prescriptions for it a week. By 2000, worldwide sales were started calling Pfizer the best company in the industry; other perform as well. Bill Steere was a happy man (take that, Merck). None of this would have been possible in the old pre-Steere world. He opened the product and threw it over to marketing for sale. Steere also ran – both the firm and the drug – to the front of the pack. Not all was smooth sailing, though, as many lawsuits surrounded the drug. He filed for \$110 million dollars on behalf of Joseph Moran, a man who claimed that he crashed his car into two parked cars and a blue lightning coming from his fingertips, at which point he was driving his Ford Thunderbird home from a date at the time. Yet the black-out was little more than a bump on the very profitable

Questions: *Viagra Case Study*

1. Some might say that the marketing strategy for Viagra ultimately was, severely tested some ethical principles. How should Pfizer have done differently? How would they stockholders?
2. How many drugs or food products can you think of that used a strategy of asking marketing to 'find' a 'disease' that required a drug as a cure?
3. Can you make a case for not allowing direct-to-consumer advertising to be prescribed under the advice of physicians? How, then, would you

Crowdsourcing Ideas (Netherlands, France, Spain)

Crowdsourcing of product design and manufacturing can take place through a number of different routes – online contests, interactive forums, community discussions, specialists and intermediaries. The added complexity of crowdsourcing does offer benefits that in many cases justify the added complexity. It offers quick access to specialized human resources and benefits from the innovative strength of idea generation outside an organization rather than drawing from internal ideas. More importantly, it potentially decreases production and inventory management costs through tight alignment of consumer needs with crowdsourced specifications, the reduction of the need for in-house research and development (R&D) and shorter marketing channels.

Customer incentives and involvement refer to methods and techniques applied by companies to engage customers in the development of new products. By leveraging the creativity, insight and wit of customers, brands are attempting to better target and segment their audience in order to predict market demand and design their marketing campaigns accordingly.

With over 10 million people contributing to crowdsourcing activities across the world, customer involvement activities are a new form of how businesses interact with customers breaking with the traditional seller-buyer relationship. Today, companies are empowering their customers to reap the benefits from their own ideas.

crowdsourcing. Several have flourished from applications.

1. Shapeways of the Netherlands is a crowdsourcing service where users upload 3D models of objects and Shapeways or others. Users can choose from a variety of materials, including plastic, metal, and wood, in a variety of locations. It has over 100 people serving a variety of customers and has three million items. Each month, it ships 60,000 or more items.
2. Hypios in France uses crowdsourcing for specific challenges. It has a large network of a million customers who submit ideas by its client.
3. eYeka in France has a community of 250,000 people who design new products. It has designed new products for P&G, Kraft, Coca-Cola, and Hyundai, Citroen and others.
4. InnogetCloud of Spain is a crowdsourcing innovation marketplace.

Boxes

141 international examples covering: advances in technology, opinion and personal stories, historical facts, strategy and management decisions and opinion.

Chapter questions

Review each chapter's content. They are designed to develop students' knowledge and skills, and develop a wider sense of how innovation techniques can be used in a variety of contexts.

CHAPTER 2: QUESTIONS FOR REVIEW

1. What do we mean by recognizing the potential of an innovation?
2. 'Not-invented-here (NIH) syndrome', 'I already know it (IAKI)', 'Prove it to me (PTM)', and 'how on earth could my firm possibly do that?' have been said to be innovation's worst enemies. Do you agree? Why or why not?
3. Consider some of the ethical questions raised by the aggressive profiteering from human frailties by

innovative medical suppliers and pharmaceutical firms. It is likely that no two people will precisely agree with each other's ethical perspective; each person carries their own moral compass, and each points a slightly different direction. Expound your own views in the classroom and encourage a larger debate.

4. It has been suggested that the US is more innovative than Asia or Europe. Do you agree or disagree? What is behind a national culture of innovativeness?

CHAPTER 2: KEY POINTS

1. Steps for assessing the potential demand for an innovation:
 - For each customer segment sketch the consumption chain
 - Identify the trigger events that precipitate customer movement from link to link
 - Put in place procedures to alert you when the trigger is pulled (and plan your response)
 - Quiz to assess needs that may not be met currently
 - Create a feature map for each significant link in the consumption chain
 - Use your knowledge of the customer experience to create blockbuster services and products
 - Put the ideas you generate into your opportunity register.
2. The innovator's mindset:
 - Successful innovators are action oriented
 - When moving fast (innovating) complexity creates confusion and delay
 - exercising their ability to capitalize on uncertainty and to take calculated risks.
3. Innovation is seldom radical and completely new. Typically it is incremental, reconfiguring and redefining existing services, business models and products, by reconfiguring existing value maps, or introducing entirely new kinds of solutions.
4. Reconfiguration is about:
 - Breaking down the barriers (technological, regulatory or organizational) that set limits on the features you can offer, or on the way that consumption chains can be configured
 - Building on your insights from the consumption chain analysis and feature map, looking to remove the limitations imposed by your existing core capabilities
 - Taking advantage of opportunities arising from the knowledge that underpins new innovations, the commercialization of those innovations and the value flows generated.

Key points

Provide a summary at the end of each chapter, to aid with revision and review of the material.

FURTHER READING

Baumol, William, (2002). *The Free Market Innovation Machine*. Princeton, N.J.: Princeton University Press.

Berne, C., Garcia-Gonzalez, M. and Mugica, J. (2012). How ICT shifts the power balance of tourism distribution channels. *Tourism Management* 33(1), 205–214.

Boyle, B. A. (2015). Influence objectives as antecedents to influence strategy selection within distribution channels, in *Proceedings of the 1995 World Marketing Congress* (pp. 277–283). New York: Springer International Publishing.

Chernova, D. V., Voytkovich, N. I. and Ivanova, N. V. (2015). Methods of logistic infrastructure formation for enterprises manufacturing bottled water. *Asian Social Science* 11(5), 274.

Christensen, C. M. and Bower, J. L. (1996). Customer power, strategic investment and failure of leading firms. *Strategic Management Journal* 17, 197–218.

Clark, K. B. and Wheelwright, S. C. (1994). *Managing New Product and Process Development*. New York: Free Press.

Further reading

Full reference information are provided at the end of each chapter, pointing you in the direction of more detailed further reading.

Subject index

As well as full and brief contents lists, you can locate subjects covered in the index that starts on page XXX.

348 Index

A	
academic, 49, 77, 81, 85, 110, 123, 153, 192, 229–230, 244, 246, 266, 298, 310, 319, 332–333	container, 14, 83–85, 178
adaptive, 2–3, 13, 18, 33, 58, 80, 130, 147	creativity, 4–5, 8–9, 12, 19, 21, 29, 32, 36, 44, 46, 79, 111, 139, 153, 162, 205, 228, 245–246, 248, 257, 262, 274–276, 278–280, 282–285, 287–288, 291–292, 296–299, 307, 320–321, 331–333, 339, 343, 345
adoption, 125, 145, 195, 201–202, 261, 268, 329	customization, 70, 114, 144, 158, 272
B	
behavioural, 121, 215, 231–234, 237–239, 241, 244, 246, 286	

LETTER TO STUDENTS FROM THE AUTHOR OF *GLOBAL INNOVATION MANAGEMENT*

This second edition of *Global Innovation Management* updates materials I have been using in classes taught at Hong Kong University of Science and Technology, University of Illinois – Chicago, the Vietnam EMBA and the University of Science and Technology in China. It addresses a question that I have encountered for at least a decade now – “If you think you have invented a winning innovation, how can you bring your innovation out of the laboratory and turn it into a commercially successful product?” It is a question that comes up often today, in all areas of industry. The question crosses many disciplines, and one that I wish were pursued more actively in business schools.

Nearly three decades ago Michael Porter suggested that innovation should be seen as a combination of invention and commercialization, reflecting received wisdom in both industry and academe. There are many books on the market that address innovation, the largest number being devoted to the first half of this combination – how to be inventive. Topics range from systems for helping people to be more creative, or better manage laboratories or idea generation. Clearly these activities must predicate any commercial successes in the market. They are necessary but not sufficient. The second half of the combination has received less attention, though there are several good books on commercialization of innovations; but the study it has received has been incomplete.

Existing books in the market that address innovation tend to fall into three categories: (1) behavioral texts on how to be more creative; (2) industrial design and R&D management books; and (3) industrial organization books that study the sources and influence of innovation.

This book is intended to fill a slightly different niche – at once pragmatic, yet supported by field research and theory. It concerns the process of being a successful innovator. It is part history, part theory, and part practical guide to the myriad tasks involved in innovating for a living. I hope it will find an audience with inventors, not just in labs but in market channels and in service industries, who want to turn their ideas into profitable and sustainable businesses.

It was my goal, in writing this text, to address the management of each major task on the path from idea creation to successful commercialization of an innovation. Creativity is addressed, in a chapter towards the end of this text, mainly as a primer on identifying creative people, and helping achieve their potential. I am biased in believing that, even though everyone can learn to be more creative, that only a small percentage of the population is good enough to generate commercially useful innovations. These ‘creative types’ can be temperamentally idiosyncratic and require special handling.

Many of the other tasks in innovation parallel the concerns of entrepreneurs, but with substantially less historical information about how to structure your business models, and substantially more uncertainty about products and customers. Variations in traditional management required of innovations constitute the main body of this text.

Finally, I spend time answering the question “Why bother?” It is not uncommon to encounter objections to the myriad difficulties entailed in high-tech and high-innovation businesses with suggestions that the firm would be better served by ‘sticking to its knitting’ so to speak, and only engaging in traditional, well-

understood businesses. Unfortunately, globalization and the rise of Internet business have moved many such ‘traditional’ industries to places where labor costs are low, environmental standards lax, and factory scales are huge. It has commoditized them, making it difficult for new entrants or small operations to compete even if they wanted. The greatest profits today are to be made in areas with high technological and business risk.

I have avoided the overuse of the term ‘technology’ throughout this book. Though many of our most successful innovations – automobiles, televisions, music players, airplanes, refrigerators, and so forth – have succeeded only long after all of the detailed technological components were well understood and developed. The technology is too often out there in the lab, waiting for the right ‘formula’ to make it attractive to a wider consumer base. This book assumes that the raw technological components are already with us, just waiting to be plucked from the laboratory, or to be searched on Google Patent Search, or called up over lunch with our engineering staff. Or it assumes that you’ve already identified your technology (maybe you’ve been hovering over it

in your lab for the past two years) and you now want to figure out what next. Or that you are a salesman, or product designer, or any one of a number of other jobs in the firm that need to keep seek the next big thing. The question arises as to how to manage all of the parts of a successful – with the emphasis on successful – design, development, introduction, sale and promotion of an innovation. In my system, technology is just one of the many components that have to be grafted into the overall innovation for success.

In my classes, I make use of a substantial amount of material that is not included in the text, but rather is available from the companion website to this book. The website allows me to continually update material, as well as provide supplemental presentation slides and exercises for in class usage. I believe the combination of a printed textbook – which is portable, easy to read, annotatable, and easy to search – in combination with a supplementary web page – which can include updates, classroom materials, and software – offers the best of both worlds.

J. Christopher Westland
Chicago

LETTER TO INSTRUCTORS FROM THE AUTHOR OF *GLOBAL INNOVATION MANAGEMENT*

Teaching a multifaceted and evolving discipline such as innovation is a humbling task fraught with pitfalls. I have grown painfully aware of this in trying to satisfy various constituencies in this 2nd edition. No two instructors agree precisely on what is important, nor how best to approach structure and pedagogy in an 'innovation' class. Innovation is a rich and interesting topic. I was fascinated by the many suggestions made for revising both structure and content of this new edition. In the end, I have needed to make choices and settle on a specific pedagogical path for this edition. This necessarily required the emphasis of some aspects of study, while making trade-offs in other potentially rewarding aspects.

This final product reflects my own vision of innovation, as well as a structure that has worked for me in the classroom. I emphasize the importance of innovating to generate a profitable business model – where product R&D, marketing and distribution channels, customer relationship management and competitive strategy are all central components of the model. These business models operate in the larger context of continual technological advancement, pervasive social networks and legal and regulatory constraints.

Where I have had choices I have tried to keep the approach as simple as possible without sacrificing comprehensiveness. This is one complaint that I have with some other widely used approaches. In particular, there are elaborately illustrated 'coffee table' books that I have found popular among Chicago area start-ups that offer up cluttered sets of tasks without fully defining what they are, how to implement them or why each is important. Faculty are in general under constraints to deliver their message clearly in a semester, or shorter time period and require a clearly defined set of roles and functions that

can be addressed within the semester. Many of the topics in these coffee table books conceivably demand their own course, when in fact the student is pressed to make sense of the larger task of innovating.

Theory is another contentious matter. Popular business 'theories' come and go, where they can provide useful perspectives on individual components of innovation. Many business theories have both detractors and profiteers, and may or may not offer a basis for longer-term practical management. The best theories can be tested empirically, whereas the weaker of them are passing fads.

I have generally tried to avoid faddism, concentrating instead on a set of flexible methods, each with clearly defined objectives that play specific roles in delivering profitable, successful innovations to market. Where I have been able to cite existing literature, I have provided references at the end of each chapter.

Innovation should not be thought of as solely the domain of 'technology' companies. Globalization, commoditization, and greater access to the fruits of technology – digital electronics, global networks and databases – affect everyone. This forces most businesses to come to grips with the single most important problem facing technology companies – the need to continually innovate to differentiate themselves in the marketplace. The difference between technology companies, and traditional businesses like real estate is that technology companies have always known that they needed to be innovative. The importance of innovation is only beginning to dawn on professionals in other fields.

The methods presented in this book are directed towards managing innovation's inherent risk through two proven techniques. The

first is the idea of ‘staging’ the development of an innovation, and seeking scale economies at each stage. The second is the idea of ‘adaptive execution’ which minimizes a firm’s own investment in resources at each stage of development. I embed both ideas in a larger framework where innovation is executed in a continuous process that keeps creating, evolving and re-differentiating the firm’s portfolio of products and ideas. In successful companies, a continuous cycle of innovation starts with a constant search for product and service opportunities. This is followed by a matching of the most promising opportunities with the company’s own competencies — the assets they own and the tasks that they do well.

Finally, innovations that are deemed worthy of investment are vetted through a step-by-step market entry that gauges customer reaction at each step, and resolves design and technical problems before they have a chance to damage a products reputation.

Topic Clusters in Global Innovation Management

This book is designed to be used as a textbook in a one or two semester class on innovation, in an engineering program, business program or other science program. The book covers major topics in innovation in 13 chapters, designed to fit them within a 14-week semester. I teach my courses in two 7-week sessions. The second semester tends to overwhelmingly focus on financial analysis, as both investment bankers and corporate management are quite interested in this aspect of innovation.

I have organized my chapters into three clusters of tasks and issues can be considered complete in their own right. The current chapter lays out my perspective and to some extent my unique perspective of innovation.

1. Internal components needed for successful innovation: this cluster of chapters presents the ‘building blocks’ of innovation. Here an innovation is not a product or service – rather it is a market niche defined by the customer’s own needs, problems and willingness to trade money for solutions recognizing that every innovation must ultimately be sold in a competitive market.

2. External factors in commercializing an innovation: intellectual property laws, disruptive innovation, technology acceleration and the competition for venture capital and finance are all important for successful innovation, but are only partly under the control of the innovator.
3. Social and technological ecosystems in which innovation thrives: emerging platforms such as robotics, autonomous vehicles, smart devices and artificial intelligence expand the innovator’s palette while introducing risk. These in turn will evolve in a context of the individual, community and society which is rapidly moving us towards a creativity based economy.

Chapters conclude with a summary of chapter key points to help put chapter principles into practice. Through this inherently dynamic framework, inventions are identified; those that are consistent with firm competences and strategy are commercialized. Commercialization always attempts to control competition and minimize risk through adaptive execution, with emergent strategy which responds to competitor offerings and tactics. The text includes a single extensive case study at the end of each chapter which applies chapter concepts, and introduces concepts for later chapters. Supporting each section in the chapter are mini-case examples that provide a comprehensive picture of how firms successfully innovate.

Chapter 1 provides a comprehensive overview of the role and significance of innovation today. It emphasizes the impact of globalization, and the consequent commoditization in eliminating advantages of location, size, brand or other previously important factors.

Chapters 2 through 6 cover all of the internal tasks that management needs to accomplish for a successful innovation. Chapter 2 presents the ‘building blocks’ of an innovation. Here an innovation is not a product or service – rather it is a market niche defined by the customer’s own needs, problems and willingness to trade money for solutions. Chapter 3 considers how the constraints of current technology, the firm’s assets and human resources, and scale provide or proscribe particular implementations of this market niche in a salable product or service. Chapter 4 looks specifically at how human resource intensive

services may be interpreted in the frameworks presented in the previous two chapters. Chapter 5 considers how a product or service can be delivered from the firm to the customer through marketing and logistic channels. Often these define an innovation; consider Amazon which is retailing the same stuff as Walmart and Best Buy, but has innovated extensively on the marketing and logistics. Chapter 6 recognizes that no firm is truly a monopoly (even monopolies need to worry about substitute products). Any innovation will be delivered in a competitive market which must be negotiated successfully.

Chapters 7, 8 and 9 address external factors influencing the business of innovation. Chapter 7 summarizes intellectual property laws. The focus is on the US, but the World Intellectual Property Organization (WIPO) helps to assure a convergence of laws around the world, so that knowing US law is useful most places in the world. The chapter ends with a workout on writing a patent – an important task that is seldom covered in business or law schools.

Chapter 8 summarizes what we know about disruptive innovation and technology acceleration, and how these necessarily dictate strategic planning and finance in technology companies. Chapter 9 assembles all of the prior topics into a financial framework that is useful for presenting the innovation and business model to potential investors.

The final four chapters address the social and technological context in which innovations become reality. Chapter 10 is entirely new for the 2nd edition, and presents emerging platforms like robotics, autonomous vehicles, the Internet of Things and artificial intelligence that are only now emerging. Most readers will see this as incomplete, and indeed, I intend only for this to be a sampling of things to come. But most important innovations in the coming decades will derive from these platforms, and this chapter should get you thinking about them. Chapters 11, 12 and 13 address important features of the individual, community and society that are moving us towards an economy based on creativity.

The complete set of topics in this book provides innovators with the tools to manage an invention from its creative origins to its successful marketing. The book's content and perspective are unique in that they focus on

the business of innovation, providing action-oriented tools for commercializing great ideas. It is my hope as an author that I will see these tools successfully applied in the promotion of new generations of ideas which can empower consumers and inventors alike. At the end of each chapter, I include an Innovation Workout, a comprehensive case study (in addition to the mini-cases included in boxed text throughout the chapter) and lists of key points and action items. The Innovation Workout provides one exercise to help you become more innovative. These are not just 'creativity' exercises. Rather they emphasize necessary skills needed for the commercialization of an innovation. Each case study emphasizes concepts discussed in the chapter, and additionally introduces ideas and real-world problems that will be addressed in the subsequent chapters.

All of the material in this text is aimed at helping you to build a profitable innovation company – one that continually explores new and uncharted market-spaces where innovation can gain them a competitive advantage. This is not a book about creativity. Nor does it promise to bring you in touch with your inner Picasso, though I do make an effort to tease out the characteristics of creative individuals who are able to harness their creativity to competitive advantage. This is a book about the business of innovation. For creative individuals and firms, I show you how to move through the creative process, to identify inventions with commercial potential, and how and when to bring an innovation to market.

In order to maintain focus, present the most useful knowledge in a one or two semester time period, and to be an effective instructional tool, the text carefully prioritizes innovation topics into 'necessary,' 'foundation' and 'optional' topics, with 90% of the material concentrated on knowledge you need to know, or the foundations underlying that knowledge. To that end, the text sets the following five educational goals:

1. to provide a set of tools, metrics and concepts - a language of innovation - that will allow managers, scientists, salespeople and investors to communicate relevant information with each other;
2. to describe those tasks that must be systematically and continuously performed for a firm to sustain or boost its rate of innovation;

3. to survey the activities that can create an innovative firm either from an existing firm, or as an entrepreneurial venture;
4. to describe who exactly are the innovative people that a firm needs in order to stay competitive; and
5. to describe where and how to employ and manage these innovators.

My overarching goal for this book is a one semester course providing a framework for innovation including the survey of relevant issues to be considered in predicting the markets in which innovations must compete. This text is uniquely my vision, one that I hope, but do not expect, that you will share completely. As a consequence, you, the reader, are invited and encouraged to customize these chapters using your own unique vision and pedagogy. The greatest innovations are a personal statement of the inventor

The Role of the Innovation Workout

Management is as much a matter of style as substance; creativity generates style from substance; innovation (invention + commercialization) is all about substance, and style is not necessary for success. Innovators are likely to lack the pragmatism, political sense and style of a good manager because they are more interested in their product-systems than in corporate and market politics. Great innovators, e.g., Thomas Edison, Henry Ford, John Warnock, etc., have made their companies successful by surrounding themselves with good administrators to complement their strengths.

How do people in corporations generate ideas? Countless ways. The consulting market in innovation tools and consulting has expanded rapidly over the past few years, and at least some of this growth is demand driven. Much of this meshes with the well-integrated sense of work-fun of Silicon Valley entrepreneurs; in contrast, they might be considered too frivolous for the button-down corporate crowd. And that is the point. Much of the value-add by business is now being generated by companies like Electronic Arts, Pixar, Apple, Google, and so forth that are

comfortable with out-of-the-box innovation; with businesses predicated on idea generation. More conservative companies rightly see their survival as tied to their ability to generate and compete on ideas. There is a lot of pressure to be creative in more conservative industries, and this is forming the market for innovation workouts which are provided by consultancies.

The way to come up with good ideas is to generate lots of them. The way to generate lots of ideas is to use tools-heuristics such as our “Assumption Reversal” workout to force you to look at a particular business challenge from all sides. Our innate bias is to see any business challenge in terms of the successful businesses we have encountered. There’s even a name for this: the “X is Good” syndrome—i.e., some solution “X” is considered good because it is the only thing we have ever seen. The innovation workouts are tools for getting those who haven’t tried it before, to think ‘out-of-the-box’.

Are managers actually drawing pictures and cutting up slides as we have instructed in some of our innovation workouts? Not always. As with most things today, many of the innovation workout techniques have been computerized. You can find write-ups by searching the WWW. The intent and concepts of these computer tools are basically the same as our innovation workouts: they are tools-heuristics that:

1. force you to look at a particular business challenge from all sides,
2. make sure that you have considered all processes and attributes that are relevant to the product-system, and
3. free your mind from existing biases, prejudices and incorrigibility.

No matter what business you are in today, staying competitive these days means getting innovative. With the innovation workouts presented in this text, you will make innovative thinking a habit, making mistakes publicly and analyzing them in front of peers and showing patience as an innovation evolves and improves. And you will have a head start on your competitors.

*J. Christopher Westland
Chicago*



INTERNAL COMPONENTS OF INNOVATION

An Introduction to Part 1

Successful innovations are born from an idea, a passion, an observation or any other of the muses that may inspire creativity. Creativity is only the beginning, though – many factors influence the maturation of a nascent vision into a fully fledged commercial venture. Some inventions are stillborn; others perish in infancy starved of capital, property rights or management. The few that evolution favours in the marketplace will possess the foundation ‘building blocks’ needed to realize the innovator’s vision. *Global Innovation Management*’s initial cluster of chapters lays out this internal scaffolding underlying any successful innovation. It recognizes that an innovation is not solely a product or service – it is also a market niche defined by the customer’s own needs, problems and willingness to trade money for solutions – and that every innovation must ultimately be sold in the competitive market.

Part 1 of *Global Innovation Management* lays out a comprehensive set of internal tasks necessary for successful innovation. It provides an overview of the role and significance of innovation, emphasizing the globalization and

commoditization which have steadily eroded monopolies on location, size, brand and other previously important factors. Chapter 2 presents the ‘building blocks’ of the innovation which define its market niche, customer needs and problems, and argues why customers will be willing to trade their hard-earned money for solutions. Chapter 3 considers how the constraints of current technology, the firm’s assets and human resources, and scale can provide or proscribe particular implementations for this market niche using a particular product or service. Chapter 4 looks specifically at how human resource-intensive services may be interpreted in the frameworks presented in the previous two chapters. Chapter 5 considers how a product or service can be delivered from the firm to the customer through marketing and logistic channels, which increasingly may themselves define the innovation. Chapter 6 recognizes that no firm is truly a monopoly – but that even monopolies need to worry about substitute products and emerging technologies.

Together the chapters of Part 1 offer a complete set of topics that provide would-be innovators with the tools to define and polish their invention from its creative origins to its successful marketing.