Strategic Analytics

Integrating Management Science and Strategy

Martin Kunc, Ph.D.



Contents

About the Companion website xi

1	Introduction to Strategic Analytics 1
1.1	What is Analytics? 3
1.2	What is Management Science? 10
1.3	What is Information Technology: New Challenges? 18
1.4	What is Strategic Management? 22
1.4.1	What are the Characteristics of Strategic Problems? 24
1.5	Strategy Analytics: Integrating Management Science with Strategic
	Management 28
	References 31
2	Dynamic Managerial Capabilities for a Complex World Under
	Big Data 35
2.1	Dynamic Managerial Capabilities 36
2.1.1	
	Cognitive Dimension 39
2.1.3	Behavior Dimension 39
2.2	Integrating Management Science and Strategic Management:
	Managers as Modelers 42
2.2.1	Modeling 43
2.2.2	Behavior with and Beyond Models 44
2.2.3	Modeling Systems 45
2.2.4	Big Data Analytics Capabilities 47
2.3	End of Chapter 48
2.3.1	Revision Questions 49
2.3.2	Case Study: The Future of Strategizing 49
	References 50
	Further Reading 54

vi	Contents
----	----------

3	External Environment: Political, Economic, Societal, Technological
	and Environmental Factors 55
3.1	The PESTE Analysis 57
3.1.1	Limitations of PESTE Analysis 58
3.2	Integrating Management Science in the Strategic Management Process 61
3.2.1	Achieving Consistency in PESTE Analysis Using the Analytic Hierarchy Process 65
3.2.2	Understanding the Evolution of PESTE Factors Using Visualization Analytics 73
3.3	End of Chapter 74
3.4.1	Revision Questions 75
3.4.2	Case Study: Westmill Co-op and the Rise of Renewable Energy 75
	References 76
	Further Reading 78
4	Industry Dynamics 79
4.1	Defining the Industry 80
4.2	Porter's Five Forces and Industry Dynamics 80
4.2.1	Bargaining Power of Suppliers 81
4.2.2	Bargaining Power of Buyers 82
4.2.3	Substitutes 83
4.2.4	Threat of New Entrants 84
4.2.5	Intensity of Rivalry 85
4.2.6	Strategic Issues Derived from Five Forces Analysis 86
4.3	Integrating Management Science into Strategic Management 91
4.3.1	Revenue Management 91
4.3.2	Evaluating Competitors' Performance in the Market Using Text Mining 96
4.4	End of Chapter 98
4.4.1	Revision Questions 99
4.4.2	Case Study: Strategic Evaluation of Entering in a New Market as a Low-cost Airline Using System Dynamics Modeling 100
4.4.2.1	Describing the Key Strategic Aspects of a Business Using a System Dynamics Model 100
4.4.2.2	The easyJet Case 100 References 105
	Further Reading 107
5	Industry Evolution 109
5.1	Dynamic Behavioral Model of Industry Evolution 113
5.1.1	Industries as Feedback Systems 114
5.1.2	A Behavioral Model of Organizations 115

5.1.3	Dynamic Behavioral Model of Industry Evolution 118
5.1.4	Types of Dynamic Behavior and Strategic Implications
	on the Evolution of Industries 119
5.2	Integrating Management Science into Strategic Management 125
5.2.1	Exploring Industry Evolution Using System Dynamics 126
5.2.2	Understanding How the Levels of Integration/Interaction Between
	Companies Affect the Evolution of Companies Using
	NKC Models 133
5.2.2.1	Insights from the Model 135
5.2.3	Uncovering the Evolution of the Technology in an Industry Using
	Latent Topic Modeling 136
5.3	End of Chapter 137
5.3.1	Revision Questions 139
5.3.2	Case Study: The Rise of Smartphones and its Impact on the Camera
	Industry 139
	References 141
	Further Reading 143
6	Competitive Advantage: Static Analysis 145
6.1	The Direction of a Company: Vision and Mission 146
6.2	Defining Value and Market Segmentation 146
6.3	Mapping the Activities to Deliver Value 149
6.3.1	Value Chain 149
6.3.2	Activity System Map 151
6.3.3	Business Model Canvas 152
6.4	Type of Business Strategies 154
6.4.1	Cost Advantage 154
6.4.2	Differentiation Advantage 154
6.4.3	Blue Ocean Strategy 157
6.5	Integrating Management Science into Strategic Management 160
6.5.1	Uncovering Market Segments Using Analytics Tools: Market Basket
	Transactions Analysis 160
6.6	End of Chapter 166
6.6.1	Revision Questions 166
6.6.2	Case Study: Revisiting Porter's Generic Strategies Using System
	Dynamics 167
6.6.2.1	The Model 169
	References 175
	Futher Reading 176
_	
7	Dynamic Resource Management 177
7.1	Resources and Capabilities 178
7.2	Resource Management 180

/iii	Contents
------	----------

7.2.1 7.2.2	Resource Conceptualization 181 Resource Development 186
7.2.3	Business Performance 187
7.3	Integrating Management Science into Strategic Management 189
7.3.1	Resource Conceptualization Using Resource Mapping (as a Problem Structuring Method) 189
7.3.2	Resource Development Using Resource Mapping, System Dynamics and Scenarios 194
7.3.3	Resource Development Under Uncertainty Using Decision Trees 196
7.3.4	Developing Decision Trees from Big Data 202
7.3.5	Inferring Business Performance from Management Science Methods 203
7.4	End of Chapter 204
7.4.1	Revision Questions 205
7.4.2	Case Study: Majestic Wines 205
	References 208
	Futher Reading 210
8	Organizational Design 211
8.1	Organizational Components 212
8.1.1	Structure 212
8.1.2	Processes 215
8.2	Integrating Management Science into Strategic Management 217
8.2.1	Network Analysis for Organizational Structure Design 217
8.2.2	Business Process Modeling 222
8.2.3	Improving Manufacturing Productivity Using Predictive Analytics 227
8.3	End of Chapter 227
8.3.1	Revision Questions 229
8.3.2	Case Study: Improving Processes in Health Services Using Simulation 229
	References 233
	Futher Reading 235
9	Performance Measurement System 237
9.1	Measuring Financial Performance 240
9.2	Strategic Controls 243
9.3	Integrating Management Science into Strategic Management 244
9.3.1	Causal Models to Design Performance Management Systems 245
9.3.2	Implementing the Performance Management System: Analyzing, Reviewing, and Reporting Performance Data – the Role of Analytics 256

9.4 9.4.1 9.4.2	End of Chapter 257 Revision Questions 261 Case Study: The Impact of Performance Measurement Systems Adoption in Business Performance: the Shipping Industry Case 262 References 267 Futher Reading 269
10	Start-ups 271
10.1	The Components of a Business Plan for a Start-up 274
10.1.1	Management 274
10.1.2	Market 278
10.1.3	Product/Service and Business Processes 279
10.1.4	Organization Design and Resources 281
10.2	Financial Management 284
10.3	Integrating Management Science into Strategic
	Management 293
10.3.1	Monte Carlo Simulation 293
10.4	End of Chapter 298
10.4.1	Revision Questions 300
10.4.2	Case Study: Designing the Next Boutique Winery 300
	References 303
	Futher Reading 305
11	Maturity 307
11.1	Strategies for Mature Organizations 310
11.1.1	Concentrated Growth, and Market and Product
	Development 310
11.1.2	Integration 314
11.1.3	Diversification 317
11.1.4	Associations with Other Companies: Joint Venture, Strategic
	Alliances and Consortia 320
11.2	Integrating Management Science into Strategic Management 323
11.2.1	Linear Optimization 324
11.2.2	Extensions in Linear Programming 326
11.2.3	Making the Integration of Organizations Reality Through Internet
	of Things and Analytics 328
11.3	End of Chapter 329
11.3.1	Revision Questions 330
11.3.2	Case Study: Choosing the Right Set of Capabilities – Development
· - · - · -	

x Conten	t:
----------	----

Index *371*

12	Regeneration 343
12.1	Strategies for Regenerating Organizations 346
12.1.1	Innovation 346
12.1.2	Turnaround 348
12.1.3	Ambidextrous Strategies 352
12.2	Integrating Management Science into Strategic Management 356
12.2.1	New Product Development: the Use of Text Analytics 356
12.2.2	Implementing Turnaround Strategies Using Data Envelopment
	Analysis: Identifying Operational Units for Either Improving or
	Pruning 357
12.3	End of Chapter 361
12.3.1	Revision Questions 362
12.3.2	Case Study: Managing Strategic Change Successfully: the Role
	of Benefits Realization Management 363
	References 366
	Futher Reading 368