

Table of Contents

Preface	VII
PART I: TECHNOLOGY LIFE CYCLES	1
1 Introduction: Revolutionary Technologies	3
1.1 Revolutionary Technologies: Why Bother?	3
1.2 Why This Book Was Written, and for Whom	4
1.3 What the Book Covers (I)	5
1.4 Theory and Practice	6
1.5 The Growth of New-to-the-World Technologies	8
1.6 Type IV Products	13
1.7 What the Book Covers (II)	14
1.8 Looking Ahead	15
1.9 Computer Industry Booms, But Where's the Marketing?	16
1.10 What Makes a Technology or a Product "Advanced"?: Innovative Products and Revolutionary Products	19
1.11 Technology Fusion	21
1.12 Technology Mapping	23
1.13 Notes	30
1.14 Appendix: The IC ² Institute and the Austin Technology Incubator	31
1.15 Questions and Problems	33
2 Technology Life Cycle and Market Segmentation	35
2.1 Stages in the Life Cycle: Buyer Segments	37
2.2 Modelling New Product Growth	40
2.3 Are There Technology "Products" Any More?	41
2.3.1 Evidence for the Death of the Product	43
2.3.2 Reasons for the Death of the Product	44
2.3.3 Summary of Survey Results	45
2.3.4 The Experiences of Other Companies	46

XII Table of Contents

2.3.5 Implications for Managers	47
2.4 How Does “High” Technology Become Just Plain Technology?	49
2.5 Technological Substitution	54
2.6 Technological Substitution in the Market Research Industry	55
2.6.1 Purchase and Audience Panels	55
2.6.2 The Rise of Scanner Panels	57
2.6.3 Substitution of Scanner Data for Diary Data	59
2.6.4 Technological Change and the Death of “Quality Research”	63
2.7 Why Such an Emphasis on Cycles?	65
2.8 Notes	69
2.9 Appendices	72
2.9.1 Spreadsheet Skills	72
2.9.2 Mathematics Review	74
2.10 Questions and Problems	85
 PART II: ACQUISITION OF TECHNOLOGIES	 93
 3 Identifying, Nurturing & Monitoring Core Technologies	 95
3.1 Defining Technology and Technology Transfer	95
3.2 Core Technologies	96
3.3 Experience Curves	101
3.4 High-Technology Firms as Evolutionary Organizations	106
3.5 Notes	109
3.6 Appendix: Mathematics Review	111
3.6.1 Logarithms and Exponentials	111
3.6.2 Experience Curves	112
3.7 Questions and Problems	113
 4 Technology Sourcing	 119
4.1 Global Scanning for Technologies	120
4.2 Ensuring Access to Outside Technologies: Managing a Supplier Relationship	121
4.3 Ensuring Access to Outside Technologies: Technology Incubation, Japanese Style	123
4.3.1 Introduction	123
4.3.2 Phased Development of a Japan Technology Incubator	123
4.3.3 Sales Points	125
4.3.4 Conclusion	128
4.4 University Technology Transfer	128
4.5 Inter-Sectoral Technology Transfer: The University-Industry Case	131
4.6 Chapter Conclusion	135

4.6.1 Technology Plan of an Academic Unit	137
4.6.2 Acquiring Information Technology	138
4.7 Notes	139
4.8 Questions and Problems	141
 PART III: MANAGING TECHNOLOGICAL RISK	 145
5 Managing Technological Risk	147
5.1 About Risk	147
5.1.1 Dealing with Risk	148
5.1.2 Risk, Values, and Long-Range Planning	150
5.2 Technological Risk	152
5.3 Product Innovation	153
5.4 New Product Development in the U.S. and Japan	154
5.5 Concurrent Engineering	160
5.6 Balancing Committed Costs and Expenditures	167
5.6.1 Introduction	167
5.6.2 Committed Costs	168
5.6.3 Postponing Cost Commitments	169
5.6.4 Product Development Risk: Empirical Results	171
5.7 Balancing the Project Portfolio	176
5.7.1 Capital Budgeting with Linear Programming	176
5.7.2 NPV vs. Decision Analysis: "Real Options"	177
5.8 The Bigger Picture: Total Corporate Risk, and Public Perception of Risk	185
5.9 Notes	188
5.10 Questions and Problems	191
 6 Influence of Government Policy On Technology Acquisition and Utilization	 193
6.1 Science, Technology, Management, and Policy	194
6.1.1 Philosophy of Federal R&D Policy	194
6.1.2 Technology Transfer Policy	195
6.1.3 Patent Reform	196
6.1.4 Competitiveness	199
6.1.5 Trade	199
6.1.6 Technology Workforce Issues	200
6.1.7 Adapting Government to Deal with Technology Convergence and Fusion	200
6.1.8 Privacy	200
6.1.9 Ethics Legislation	201

XIV Table of Contents

6.1.10 Taxes	202
6.1.11 Changing Roles of the U.S. and Russian National Laboratories	202
6.2 Pertinent Publications on U.S. Federal S&T Policy	204
6.3 Japanese Industrial Policy	206
6.4 Technology Industry Policy at the Local and Regional Levels	211
6.4.1 Technology and Regional Economic Development	211
6.4.2 ParcBIT and Balearic Economic Development - A Consulting Report	212
6.5 Notes	218
6.6 Appendix: Terminology of the Japanese Government-Industry Relationship and Allied Areas	220
6.7 Questions and Problems	222

PART IV: NEW-TO-THE-WORLD PRODUCTS 225

7 Researching Technology Markets in a Fast-Cycle World	227
7.1 Forecasting	227
7.2 Technology Forecasting	229
7.2.1 How Did Technology Forecasting Get Started?	229
7.2.2 Why Do Companies Do Technology Forecasting?	229
7.2.3 What Are the Tools of Technology Forecasting?	230
7.2.4 Using These Tools	231
7.2.5 What Impact Do the Technological Trends Have on Us?	235
7.3 Technology Assessment	236
7.4 Technology Appraisal	239
7.4.1 The NTCCs	239
7.4.2 The Ames NTCC	240
7.4.3 The Johnson NTCC	240
7.4.4 The Appraisal Procedure	241
7.5 Market Information and the Total Life Cycle	251
7.6 Further Reading	255
7.6.1 Scientific Communication	255
7.6.2 Consortium-Building; Technology Forecasting	256
7.6.3 Interdisciplinary Discourse; Technology Assessment	256
7.6.4 Global Technology Scanning	256
7.6.5 Patent Search	256
7.6.6 Competitor Intelligence	257
7.6.7 Expert Opinion	257
7.6.8 Market Forecasting	257
7.6.9 PPSM Information	257

7.6.10 Concept Evaluation	257
7.6.11 Focus Groups	258
7.6.12 NPD Team Communication	258
7.6.13 Pre-Test Market	258
7.6.14 Test Market	258
7.6.15 Customer Satisfaction Surveys	258
7.6.16 Customer Tracking	259
7.7 Tracking the Introduction of a New Product: What Really Happens?	259
7.8 Notes	262
7.9 Questions and Problems	262
8 Adopting New-to-the-World Products	265
8.1 Introduction: Barriers to Adopting NTW Products	265
8.2 Perceived Risk	266
8.3 QWERTY vs. Dvorak	267
8.4 Innovation and Social Systems	268
8.5 Classification of Adoption Decisions for Innovations	269
8.6 The Adoption Process	270
8.7 Classification of Innovations	271
8.8 Stages of Developmental Learning	273
8.9 Effecting Change in People and Organizations	278
8.10 Transferring Outside Technologies into the Firm. Diffusing Adopted Technologies within the Firm	280
8.11 Life Cycle Cost	282
8.11.1 Introduction to LC Cost	282
8.11.2 Steps in LC Costing	284
8.11.3 Mission Scenarios	285
8.11.4 Materiality	285
8.11.5 Cost Elements	285
8.11.6 Cost Parameters	286
8.11.7 Cost Relationships	288
8.11.8 An Automobile Life Cycle Cost Example	288
8.11.9 Aggregate to Determine LC Cost for the Design Alternative	289
8.11.10 Disposal Costs	290
8.11.11 LC Decisions	290
8.12 How to Be a Change Agent on the Seller Side: The Case of a Marketing Decision Support System	293
8.12.1 The Company	293
8.12.2 The Data	294
8.12.3 The Clients	295
8.12.4 The Necessity Which Was the Mother of DYANA™	296

XVI Table of Contents

8.12.5 Special Features of the DYANA DSS	297
8.12.6 Problems, Progress, and Opportunities	300
8.12.7 The Future	302
8.13 How to Be a Change Agent on the Buyer Side: PC Insertion in a Mainframe-Centric Company	303
8.14 How Long Will It Take?	306
8.15 Marketing Invisibles	307
8.16 Psychographics of the PC Market	308
8.16.1 An “Understanding Gap”	310
8.16.2 Techno-Typing	310
8.17 Notes	313
8.18 Questions and Problems	314
9 Strategies and Tactics for Marketing New-To-the-World Products	319
9.1 A Catalog and Workbook of Strategies	320
9.1.1 Comfort Factors	320
9.1.2 Picking Your Customers	327
9.1.3 Marketing Mix and Positioning	329
9.1.4 The Value of the Brand	335
9.2 Appendix: Technology Marketing in Japan - A Bibliography	336
9.2.1 Introduction	336
9.2.2 Contents of the Bibliography	336
9.2.3 Brief Summary of the Cited Works	337
9.2.4 The Bibliography	338
9.3 Notes	340
9.4 Questions and Problems	341
PART V: INTO THE FUTURE	343
10 Escaping the Niche Market; Moving to the Mass Market	345
10.1 Niche Marketing vs. Mass Marketing	345
10.2 Standardization Strategies	346
10.3 The GAP Strategy	355
10.4 The Trojan Horse	357
10.5 Conclusion	358
10.6 Notes	358
10.7 Questions and Problems	359
11 The Future of Technology Commercialization	361
11.1 Vision. Changing the World	361
11.2 Systematizing Commercialization	363

11.3 New Institutions for Promoting Technology Entrepreneurship	367
11.3.1 New Business Incubators	369
11.3.2 Technology Brokers	374
11.4 Additional Cases: High-Tech Entrepreneurial Companies	375
11.4.1 Autogenesis	376
11.4.2 Corporate Memory Systems, Inc.	379
11.4.3 Medical Polymers Technologies, Inc.	381
11.4.4 Expert Application Systems, Inc. (EASI)	386
11.4.5 American Innovations, Inc.	389
11.5 Notes	391
11.6 Questions and Problems	391
Subject Index	395
Name Index	409



<http://www.springer.com/978-3-540-41258-8>

Market-Oriented Technology Management
Innovating for Profit in Entrepreneurial Times

Phillips, F.Y.

2001, XVII, 418 p., Hardcover

ISBN: 978-3-540-41258-8