

The Management of Technological Innovation

Strategy and Practice

Completely Revised and Updated

Mark Dodgson

David Gann

Ammon Salter

UNIVERSITÄT
LIECHTENSTEIN

Bibliothek

OXFORD
UNIVERSITY PRESS

DCONTENTS

LIST OF FIGURES	xviii
LIST OF TABLES	xx
LIST OF BOXES	xxi
ABBREVIATIONS	xxiv
1 What is the Management of Technological Innovation and Why is it Important?	1
Introduction	1
Why is MTI so important?	5
The challenges of MTI	10
Case studies in MTI	11
Summary and conclusions	23
2 The Business Context for the Management of Technological Innovation	25
Introduction	25
The changing nature of industry and business	25
Business and innovation systems	32
The changing nature of management	41
Globalization	48
Summary and conclusions	52
3 Technological Innovation	54
Introduction	54
Types and extent of innovation	54
Managing incremental and radical innovation	57
The changing nature of the innovation process	60
The fifth-generation innovation process	63
Sources of innovation	69
Measuring innovation	76
Outcomes of innovation	84
Summary and conclusions	92
4 Innovation Strategy	94
Introduction	94
What is an innovation strategy?	95

Why is innovation strategy important?	99
Innovation strategy in practice	99
Types of innovation strategy	103
Formulating an innovation strategy	106
Building innovative capabilities	108
Returns from innovation strategy	122
Innovation strategy in SMEs	126
Summary and conclusions	131
5 Networks and Communities	133
Introduction	133
What are networks and why are they important?	133
Scientific networks	135
Social capital	136
Harnessing users for innovation	141
Technological collaborations	147
Why do firms collaborate to develop technology?	147
The extent of technological collaboration	149
The challenges of managing technological collaboration	150
Organizational learning in networks and communities	155
Trust in networks and communities	157
Summary and conclusions	159
6 The Management of Research and Development	160
Introduction	160
Why do firms do R & D?	160
Patterns of R & D expenditure	162
Organizing R & D	165
Managing research teams	171
Managing creativity in research	177
Balancing research portfolios	180
Managing international R & D	186
Summary and conclusions	195
7 The Management of Product and Service Innovation	197
Introduction	197
What is a product or service innovation?	197
The potential benefits of PSI	199
Failure in PSI	202

Encouraging successful PSI	207
The role of design in PSI	224
Summary and conclusions	234
8 Innovation in Operations and Processes	235
Introduction	235
What are operations?	235
The innovation-operations conundrum	238
Importance of operations for delivering innovation	239
Industry, technology, and markets	240
Techniques of operations and production management	241
Lean production	246
Automation	248
Investment appraisal techniques	252
The internal integration of operations and production	253
The external integration of operations and production	255
Innovation in processes	259
Summary and conclusions	266
9 Delivering Value from Innovation	267
Introduction	267
Positioning in the value chain	267
Private and social returns to innovation	269
Selecting paths to market	270
How to commercialize	282
Standards	296
Marketing technology products/downstream support	300
Technology transfer	303
Summary and conclusions	306
10 Five Future Challenges	307
Managing technology-based competition	307
Managing the new innovation process	312
The role of government	315
The role of basic research	318
Sustainable business	321
BIBLIOGRAPHY	327
INDEX	355