

Table of Contents

PART 1. The Global Innovation World: Which Visions Ahead?	1
Chapter 1. Inventing the Future	3
Fabienne GOUX-BAUDIMENT and Christopher B. JONES	
1.1. Innovation.	4
1.1.1. How should innovation be designed?	4
1.1.2. Profile of the innovator	6
1.2. Futures thinking	8
1.2.1. Futures thinking: a tool to build the future	8
1.2.2. Profile of the futurist	10
1.3. Change and network	12
1.3.1. When innovation feeds futures thinking: the study of change.	12
1.3.2. When futures thinking helps innovation: opening the road to change.	17
Chapter 2. Innovation Management: How to Change the Future	25
André-Yves PORTNOFF	
2.1. The innovation, beyond technique	25
2.1.1. The fiction of the linear model	25
2.1.2. Technically and societally viable.	26
2.1.3. Technical and societal futuribles	27
2.2. Innovations in an era of digital networks	28
2.2.1. More and more power	28
2.2.2. Cost of organizational transaction and innovation.	29
2.3. Shortsightedness against innovation	30
2.3.1. Credibility of the message and the messenger?	30
2.3.2. Outdated evidences.	30

2.3.3. A too narrow vision	31
2.3.4. False proofs	31
2.3.5. Significances ignored	32
2.3.6. Under-estimation of evolution potential	33
2.3.7. Dare to imagine breaks	33
2.3.8. Blinding arrogance	34
2.3.9. “The situation is under control”	35
2.4. Innovation as a process of creation of values	36
2.4.1. Sell the training with the product.	36
2.4.2. Network, creator of value	37
2.5. Conclusion	38
Chapter 3. From Knowledge to Business: Virtual Encounters Propagate Innovation	41
Patrick CORSI and Barnabas TAKÁCS	
3.1. Where information society mixes up our linear and local schemes	42
3.2. Knowledge on the move through networks: examples of innovation processes	44
3.3. Three laws underpinning technological evolution	46
3.4. How do virtual encounters ride the technology lifecycle curve?.	47
3.5. The virtual human interface (VHI) brings a new meaning to communication	49
3.6. The emotional modulation opens up new business spaces	52
3.7. The requirements for a VHI	52
3.8. Bridging the digital divide: should not we replace the ill-fated WIMP interface?	54
Chapter 4. Value Management’s Creative-Destruction via Digitalized Innovation: The Winning Plan	57
Jean MICHEL and Roy WOODHEAD	
4.1. Introduction.	57
4.2. The straightjacket of selling training and certification agenda.	58
4.3. What exactly does innovation mean?.	59
4.4. Value management: a long history	61
4.5. Definitions and rigidity	67
4.6. Potential of valorique in relation to the innovation.	70
4.6.1. Problem scanning and framing: “inquiry and questioning”	70
4.6.2. A “systemic” step with mobilization-confrontation from multiple points of view.	71
4.6.3. A reference frame that defines “functional need” based on function analysis	72

4.6.4. Cost intelligence and focusing on the economy of the means	73
4.6.5. The mobilization of information, knowledge and competences. . .	74
4.6.6. Project management and the rigor of VA.	75
4.6.7. The explicit or implicit recourse to the practices and techniques that enable creativity.	75
4.7. Digital technology, networking, and an ability to innovate differently .	76
4.7.1. The “valorique” culture	77
4.7.2. The digital revolution	78
4.7.3. Two innovating processes of different natures.	79
4.7.4. The digital arrival of “valorique”	80
4.8. VM and digital networks	81
Chapter 5. Research, Innovation and Technological Development	85
Mélissa SAADOUN and Lin YANNING	
5.1. Introduction.	85
5.1.1. Innovation is about taking risks and managing change.	85
5.1.2. The importance of innovation in the economy.	86
5.2. Science, technology and innovation: building regional capacities. . . .	86
5.2.1. Promoting business opportunities in science and technology	87
5.2.2. Promoting infrastructure development as a technology learning process	87
5.2.3. Expanding access to science and technology education and research	88
5.2.4. Improving science and technology advice	88
5.3. Technology and global science for a better development	88
5.3.1. Structural funds to support research and innovation	90
5.3.2. Technology in today’s global setting	90
5.3.3. Technological capabilities.	91
5.3.4. Infrastructure and technological innovation	94
5.3.5. Research facilities as infrastructure	95
5.3.6. Mobilizing the engineering profession	95
5.4. Innovation and economic advance	96
5.4.1. Platform technologies with wide applicability.	97
5.4.2. Information and communication technology.	97
5.4.3. The network revolution	98
5.5. Investing in science, technology and education.	99
5.5.1. New roles for universities	99
5.5.2. The role of ICT in education	101
5.5.3. The role of universities in innovation	102
5.6. Conclusion	103

Chapter 6. Sustainable Innovation through Community Based Collaborative Environments	105
Marc PALLOT and Kul PAWAR	
6.1. Introduction.	105
6.2. Components of collaboration	106
6.2.1. Different forms of collaboration	106
6.2.2. Different methods of work	108
6.2.3. Mobility	109
6.2.4. Teleworking (distance or remote working).	110
6.3. A systematic approach to collaboration	111
6.4. The collaborative enterprise	112
6.5. The network of innovative companies	113
6.5.1. Mixed marketing	113
6.5.2. Strategic coordination of partner networks	114
6.5.3. Financing innovation within a network	114
6.5.4. Company networks as incubators of innovation	114
6.5.5. The infrastructure of collaboration.	114
6.6. Concurrent engineering.	115
6.7. Adaptation of the collaboration process	117
6.8. Management of a collaborative project	118
6.9. Conclusions.	121
Chapter 7. New Spaces for Innovation, New Challenges	123
Hiroshi MIZUTA, Victor SANDOVAL and Henri SAMIER	
7.1. Introduction.	123
7.2. Internet waves	124
7.2.1. P2P technology	127
7.2.2. Grid computing technology	128
7.2.3. Grid computing in Japan.	131
7.3. Strategies of innovation.	133
7.4. Hyperspace: new dimension of innovation.	135
7.4.1. Hyperspace laws	136
7.4.2. Hypertime or space time.	138
7.4.3. Distance and hyperdistance	140
7.5. Cyberenergy and cyberentropy	141
7.6. Conclusions.	143

PART 2. Tooling Innovation: Which Methods to Play and How?	145
Chapter 8. Knowledge Management for Innovation.	147
Marc de FOUCHÉCOUR	
8.1. Introduction.	147
8.1.1. Studies	147
8.1.2. Objectives and plan.	149
8.2. Innovation and knowledge	150
8.2.1. Some dualities.	151
8.2.2. Innovation and knowledge	152
8.3. Reports	153
8.3.1. The reversal of the pyramid.	153
8.3.2. Complex – collective	153
8.3.3. The paradox of time: compression and space	154
8.3.4. Stakeholder-oriented management.	154
8.3.5. Matrix organization.	154
8.3.6. Methods, tools and incantations	154
8.4. Knowledge: some “organizers”	155
8.4.1. The DIK model (Data-Information-Knowledge): knowledge as an object	156
8.4.2. The creative spiral and the Ba	158
8.4.3. Knowledge as a process	160
8.4.4. Cycles of innovation and of knowledge.	161
8.5. Cultures, methods and tools	166
8.5.1. Where do we start?	166
8.5.2. Methods and tools for collective knowledge	167
8.5.3. Induced effects and combinations	171
8.6. Key factors	172
8.6.1. To share or not to share?.	172
8.6.2. Learning or teaching	173
8.6.3. Stress and confidence	173
8.7. Conclusions and openings	173
Chapter 9. Integration of Stylistics and Uses: Trends in the Innovation Process	175
Carole BOUCHARD, Hervé CHRISTOFOL and Dokshin LIM	
9.1. Theories and concepts of stylistic innovation.	176
9.1.1. The universe of exchanges and influences	176
9.1.2. Trends in design.	176
9.1.3. The stylistic attributes	177
9.1.4. Usage attributes	178

9.1.5. Stylistic tendencies and use	179
9.1.6. Reasoning in the design professions and analogy in particular	179
9.1.7. Human values and product value.	181
9.2. Methods and tools of stylistic innovation	182
9.2.1. The universe of exchange to the universe of influences	182
9.2.2. The analysis of iconic contents	183
9.2.3. Modeling of the analysis process of the tendencies of a universe of exchange	185
9.2.4. The harmonies of attributes	187
9.2.5. The chain of value/function/attribute	188
9.3. The step of stylistic monitoring and its application in designing the automobile trends panel	190
9.3.1. The construction of specifications and requirements	190
9.3.2. The determination of the influential universes	191
9.3.3 the analysis of the tendencies and their descriptions.	193
9.3.4. The integration of tendencies in design of product	193
9.4. Conclusion	195
Chapter 10. Virtual Reality Technologies for Innovation	197
Simon RICHIR, Patrick CORSI and Albert “Skip” RIZZO	
10.1. Introduction	197
10.2. The digital chain of conceptualization in the enterprise	198
10.3. Work on virtual project platforms	200
10.4. Virtualization of professions	202
10.5. What Virtual environments really mean	206
10.5.1. Today’s challenges	206
10.5.2. Perspectives	208
10.6. The challenge ahead	211
Chapter 11. TRIZ: A New Way of Innovation	213
Darrell MANN and Pascal CRUBLEAU	
11.1. Introduction	213
11.1.1. Product designing methods	213
11.1.2. An important stage	214
11.2. A deterministic vision of future technologies	215
11.2.1. General introduction	215
11.2.2. Introductory ideas	217
11.2.3. Postulates of TRIZ	218
11.3. Conclusion	221

Chapter 12. C4 Innovation Method: A Method for Designing Innovations	223
Olaf MAXANT, Gérald PIAT and Benoît ROUSSEL	
12.1. Introduction	223
12.2. The approach of innovation in the commercial domain of EDF R&D	225
12.3. The C4 method	227
12.3.1. Overview of the method	227
12.3.2. Phase 1: comprehension of demand	227
12.3.3. Phase 2: creation	228
12.3.4. Phase 3: contextualization	229
12.3.5. Phase 4: confrontation	231
12.3.6. Modeling of the process	231
12.4. Diverse experimentations of the process	232
12.4.1. The “New Offers” project: contribution of the dynamic concept in comparison to the static concept	232
12.4.2. Collaboration with the Studio Créatif of France Télécom: towards an evaluation of service.	234
12.5. Some new tools to facilitate the collaboration and the contextualization; towards an instrumentation of the process: “IdéoFil” and “StoryoFil”	235
12.5.1. IdéoFil.	236
12.5.2. StoryoFil	238
12.6. Conclusions	238
 Chapter 13. Creativity World.	 239
Michel SINTES	
13.1. Introduction	239
13.2. Reflections on creativity	239
13.3. A human concept.	240
13.3.1. Idea/intention	241
13.3.2. Thought/objective	242
13.3.3. The emotional aspect	242
13.3.4. Behavior	243
13.3.5. Result	244
13.3.6. Mini-cycle of creativity	245
13.3.7. The scale of values	246
13.4. The state to being one with the environment	248
13.5. The age of networks	250

PART 3. Innovation Management: Which Factors Underpin Success? . . .	251
Chapter 14. Psychology of Innovation and Change Factors	253
Laurent DUKAN	
14.1. Introduction	253
14.2. Innovation and research	255
14.3. Change in mentality	255
14.4. The principal cultural indicators for innovation	256
14.4.1. Fear and taking risks	256
14.4.2. Conformity and originality	257
14.4.3. The unknown and the future	257
14.4.4. Complexity	259
14.4.5. Mechanistic, systemic and complex thought	260
14.4.6. Communication and recognition	262
14.4.7. Failure and success	264
14.5. Conclusion	265
Chapter 15. Intellectual Property for Networks and Software	267
Sylvain ALLANO	
15.1. Introduction	267
15.2. State of the problems and the protagonists	268
15.3. The main “nodes” in intellectual property amidst the networks operated in the context of innovation	268
15.4. Intellectual property rights applicable to the context of networks . . .	270
15.5. Copyright “software” against networks	270
15.5.1. The main statutory copyright “software”	270
15.5.2. Intellectual property of the software circulating in the network . .	271
15.5.3. Intellectual property for software involving networks	272
15.5.4. Software copyright limitations	272
15.5.5. Software copyright	273
15.6. Free software	273
15.7. Protection through patents for communication software and networks	274
15.8. Actors in the networks and intellectual property	275
15.8.1. Intellectual property of databases	275
15.8.2. Expert systems and tools of artificial intelligence	276
15.8.3. Computer generated creations	276
15.9. Digital Rights Management (DRM)	276
15.10. When the networks themselves become tools for intellectual property	277

15.11. Enforcing intellectual property rights on the network scale	277
15.12. Conclusion: intellectual property and the networks: an advantage for innovation	278
Chapter 16. Innovation Scoreboard for Core Competencies Evaluation. . .	279
Nathalie SAMIER	
16.1. Introduction	279
16.2. Locations of the immaterial capital	280
16.2.1. Contribution of the theories of resources	280
16.2.2. The immaterial capital: intangible investment and intangible assets	281
16.3. Competences to innovate	282
16.3.1. Competences resulting from an internal interaction	283
16.3.2. Competences resulting from an external interaction.	283
16.4. The key to the creation of knowledge.	284
16.4.1. Modes of conversion of knowledge	285
16.4.2. The spiral of knowledge	286
16.5. The valorization of innovation in terms of the scoreboard	287
16.5.1. The value of IC conceived by SKANDIA.	287
16.5.2. The SKANDIA navigator	288
16.5.3. The adaptations of SKANDIA model	290
16.6. Conclusion	293
Chapter 17. Financing Innovation	295
Pascale BRENET	
17.1. Needs for financing associated with innovation.	295
17.1.1. Time, risk and cost of innovation.	296
17.1.2. The financial lifecycle of innovation.	298
17.1.3. The financial fragility of innovating small companies	301
17.2. Adaptation of resources to innovation: “patient” and “loseable” money.	301
17.2.1. Arbitration between debt and capital.	302
17.2.2. A pool of resources	304
17.3. The financial system of innovation	306
17.3.1. Capital-investment	306
17.3.2. Markets of growing stocks.	310
17.3.3. Public financing of innovation	311
17.4. Conclusion	312

Chapter 18. Innovation on the Web	315
François DRUEL	
18.1. Introduction	315
18.2. Distribution model: Open Source and software patents	317
18.2.1. The clash of the titans	317
18.2.2. Publication vs. patents: innovation vs. industry?	319
18.3. An enormous base of information	320
18.4. Marketing and innovation on the Web	322
18.4.1. A leverage	322
18.4.2. A deep impression	323
18.4.3. New reflexes	324
18.5. A fantastic tool for sharing	325
18.5.1. If you don't know, ask, and if you know, share!	325
18.5.2. Business-to-business: Eldorado or damp squib?	326
18.6. E-commerce: a soufflé fallen flat?	327
18.6.1. Between the hare and the tortoise.	328
18.6.2. Incorrect good ideas for reel disadvantages.	330
18.7. Conclusion	331
Chapter 19. Virtual Decision Support System for Innovation	333
Emmanuel CHÉNÉ	
19.1. Introduction	333
19.2. From the management of innovation to the management of design	334
19.3. Intermediary virtual representations in the industrial context and transmissible via the Internet	337
19.3.1. From VIR in fixed 2D to VIR in interactive 3D via the Internet	337
19.3.2. Characterization of virtual intermediary representations in the industrial context and its transmission via Internet	339
19.4. Developing a decision-making aid with joint analysis software	340
19.4.1. Software tools for joint analysis	341
19.5. Implementation of the software in SME of packaging creation	342
19.5.1. Choice of designs and specifications.	343
19.5.2. Collection of data	344
19.5.3. Calculation of uses	345
19.6. Analysis of contributions of VIR with joint analysis in designing.	346
19.6.1. Cognitive limitations	347
19.6.2. Limitations in terms of management of decision-making aids.	348
19.7. Perspectives	349
19.8. Conclusion	350

Chapter 20. Shapes, Knowledge and Innovation	353
Jean-Pierre MATHIEU, Michel LE RAY and Ilya KIRIA	
20.1. Introduction	353
20.1.1. Existence and theory of universal forms: chosen angles and sacred proportions	354
20.2.1. Notion of chosen angles developed by physical sciences and between microscopic and macroscopic scales	355
20.2.2. Golden angles and forms constructed by man	356
20.2.3. Golden angles and other geometric forms.	360
20.2.4. Contributions of neurophysiology	361
20.2.5. Contribution of cognitive psychology	363
20.3. The spatial quantification of an object	363
20.4. Overall finding	370
 Bibliography	 373
 List of Authors	 397
 Index	 401