Contents

Preface ix

Part 1. Theoretical Elements 1

Chapter 1. A Knowledge Value Chain 3

1.1. Introduction. 3
1.2. Different KVCs 4
1.3. The DIKW model 8
1.4. KVC and management 13
1.5. Transformation processes in the KVC 15
1.6. Practical application. 19
1.7. Conclusion 22

Chapter 2. The Knowledge Capital of a Company 23

2.1. Introduction. 23
2.1.1. The accumulation of knowledge 23
2.1.2. The company as knowledge producer 24
2.2. Modeling a company as a knowledge producer. 25
2.2.1. Systemic modeling 25
2.2.2. The “black box” model 26
2.2.3. The “division of labor” model 27
2.2.4. The informational model 27
2.2.5. The knowledge capital model. 28
2.2.6. The knowledge capital and knowledge actors model 31
2.2.7. Integration of customer knowledge and external knowledge into the AIK model. 33
2.3. The operators of the AIK model 35
2.3.1. The Wenger operator. 35

2.3.2. The Nonaka operators 35
2.3.3. Integration of the Nonaka theory into the AIK model 37
2.4. Tacit/explicit knowledge and knowledge communities 39
2.5. Mapping as a modeling tool to steer the AIK system 41
2.6. Practical application 43
2.7. Conclusion 45

Chapter 3. The Structure of Knowledge 47

3.1. Introduction 47
3.2. The semiotic triangle of knowledge 48
3.3. The systemic triangle of knowledge 52
3.4. The knowledge macroscope 54
3.4.1. Knowledge and information 55
3.4.2. Knowledge and meaning 56
3.4.3. Knowledge and context 57
3.5. Practical application 59
3.6. Conclusion 64

Chapter 4. Shannon's Theory of Knowledge 65

4.1. Introduction 65
4.2. Some definitions and notations 66
4.2.1. The basic unit of knowledge 66
4.2.2. Measuring knowledge 68
4.2.3. Quantity of knowledge in a corpus 69
4.3. Measurement of the quantity of information in a corpus 70
4.4. Measurement of the quantity of meaning in a corpus 75
4.4.1. Definitions and notations 75
4.4.2. Quantitative characterization of semantic graphs: Gurevich entropy 76
4.5. Measurement of usage context in a corpus 83
4.5.1. Introduction 83
4.5.2. Social networks 84
4.5.3. Hierarchical small-world networks 86
4.5.4. Scale-free networks 89
4.5.5. Quantitative characterization of the usage graph of a corpus 90
4.6. Practical application 91
4.7. Conclusion 93

Part 2. Practical Elements 97

Chapter 5. A New Approach to KM 99

5.1. Introduction. 99
5.2. Two examples of KM standardization 100
5.2.1. KM and international standardization 100
5.2.2. KM in the nuclear domain. 101
5.3. The French Knowledge Management Club 103
5.4. Conclusion 105

Chapter 6. A Framework for Knowledge-based KM 107

6.1. Introduction. 107
6.2. The Daisy Model 108
6.3. Building a KM process framework 110
6.4. Conclusion 113

Chapter 7. KM: From Strategy to Implementation 115

7.1. Introduction. 115
7.2. Framing a KM project 116
7.2.1. The objectives 116
7.2.2. Responsibilities and roles 117
7.2.3. Resources 119
7.2.4. Internal communication 119
7.2.5. Connections between KM and other company issues. 119
7.2.6. Other subjects of interest to consider 121
7.3. Implementing the KM project 121
7.4. Monitoring the KM system 124
7.5. Conclusion 125

Chapter 8. Analyzing Knowledge Capital and Elaborating a KM Plan 127

8.1. Introduction. 127
8.2. Tools for analyzing knowledge capital. 128
8.2.1. Maps 128
8.2.2. The knowledge criticality analysis grid 129
8.3. The knowledge capital analysis process 132
8.3.1. Step 1: analyzing critical capacities 132
8.3.2. Step 2: analyzing critical knowledge 134
8.3.3. Step 3: strategic alignment 137
8.3.4. Step 4: elaborating a KM plan 139
8.4. Conclusion 142

Chapter 9. Implementing the KM Plan 143

9.1. Introduction 143
9.2. Knowledge organization 144
9.2.1. Tangible resources (explicit knowledge) 144
9.2.2. Intangible resources (tacit knowledge) 145
9.2.3. New knowledge resource additions 146
9.3. Knowledge codification 147
9.3.1. Lessons learned 148
9.3.2. Knowledge-based documents 149
9.3.3. Knowledge books 159
9.4. Knowledge sharing 179
9.4.1. Knowledge communities or communities of practice 179
9.4.2. Knowledge transfer 184
9.5. Knowledge search 193
9.5.1. Knowledge search and information retrieval 194
9.5.2. The knowledge search process 196
9.5.3. The challenge of KM in knowledge search 198
9.6. Knowledge creation 200
9.6.1. Knowledge creation and innovation 200
9.6.2. Knowledge-based innovation 202
9.6.3. Evaluating the maturity of the innovation process 207
9.7. Conclusion 209

Bibliography 211

Index 219