

Contents

1	Collaboration and Decision-Making in Context	1
1.1	The Evolving Controlled Object	1
1.1.1	The Enterprise as a Large-Scale System	2
1.1.2	Adopted Terminology	5
1.1.3	Classification	5
1.2	From Hierarchical Control to Cooperative Schemes	6
1.2.1	Hierarchical Systems Approach	7
1.2.2	Towards Cooperative Schemes	8
1.3	The Role of the Human in the System	10
1.3.1	The Human in the Loop	11
1.3.2	Allocation of Functions and Levels of Automation	12
1.3.3	The Need for Effective Computer Supported Collaboration	16
1.4	Towards Anthropocentric Information Systems	17
1.4.1	Several Questions and Answers	17
1.4.2	Attributes	18
1.5	Decisions and Decision Units	19
1.5.1	Definitions	19
1.5.2	Possible Approaches	20
1.5.3	Multicriteria Decision Models	22
1.6	Notes and Comments	25
	References	26
2	Decision Support Systems	31
2.1	Decisions and Decision-Makers	32
2.1.1	Herbert Simon's Process Model of Decision-Making	32
2.1.2	Limits and Constrains of Human Decision Makers	34
2.1.3	Classes of Decision-Makers	34
2.2	DSS Basic Concepts	35
2.2.1	Definition and Characteristic Features	36

2.2.2	DSS Technology	37
2.2.3	A Special Case: Real-Time DSS for Control Applications	40
2.3	DSS Subclasses	42
2.3.1	Classification 1 (with Respect to Decision Maker Type)	43
2.3.2	Classification 2 (with Respect to Type of Support)	44
2.3.3	Classification 3 (with Respect to the Technological Orientation)	44
2.3.4	Special Cases	45
2.4	DSS Construction	51
2.4.1	Influence Factors	51
2.4.2	Design and Implementation Approaches	53
2.4.3	Selection of the I&CT Tools	57
2.4.4	Integration and Evaluation	60
2.5	Notes and Comments	62
	References	63
3	Collaborative Activities and Methods	71
3.1	Computer Supported Collaboration	71
3.1.1	Collaboration, e-Collaboration and Collaborative Groups	71
3.1.2	Brief History of e-Collaboration	74
3.1.3	More About Group Support Systems	77
3.1.4	Crowdsourcing—A Special Case of Collaboration	79
3.2	Fundamentals of Social Choice	80
3.2.1	Aggregating Individual Preferences	81
3.2.2	Voting Mechanisms	83
3.2.3	Axioms and Paradoxes	87
3.2.4	Implications for Group Support Systems	90
3.3	Further Extensions from Social Choice Theory to Group Decisions	92
3.3.1	Judgment Aggregation	93
3.3.2	Resource Allocation	97
3.3.3	Group Argumentation	102
3.4	Collaboration Engineering	104
3.4.1	Basic Collaboration Patterns	105
3.4.2	Collaborative Decision-Making Process	108
3.4.3	Deployment of Collaboration Models	110
3.5	Notes and Comments	113
	References	114

4	Essential Enabling Technologies	121
4.1	Modern Data Technologies	122
4.1.1	Data-Driven Decision Support Systems	122
4.1.2	Big Data	124
4.1.3	Business Intelligence and Analytics	125
4.1.4	Towards a Data Science	127
4.2	Web Technologies	129
4.2.1	The Concept	129
4.2.2	Particular Subclasses	129
4.2.3	Usages and Relevance to Collaborative Decision-Making	131
4.2.4	Standards	134
4.3	Social Networks	135
4.3.1	The Concept	135
4.3.2	Particular Subclasses	136
4.3.3	Usages and the Relevance to Collaborative Decision-Making	138
4.3.4	Standards	140
4.4	Mobile Computing	141
4.4.1	The Concept	141
4.4.2	Classes and Subclasses	142
4.4.3	Usage and Relevance to Collaborative Decision-Making	146
4.4.4	Mobile Cloud Computing	149
4.5	Biometric Technologies for Virtual Electronic Meetings (By I. Buciu)	151
4.5.1	The Concept	152
4.5.2	Particular Subclasses	154
4.5.3	Mobile and Web-Based Technologies	158
4.5.4	Possible Attacks	159
4.5.5	Attributes of Effective Technologies	160
4.5.6	Standards	161
4.6	Game Technology as a Tool for Collaborative Decision-Making (By Ioana Andreea Ștefan)	162
4.6.1	The Game Mechanics	163
4.6.2	Software Tools	164
4.7	Notes and Comments	166
	References	167
5	Applications	177
5.1	A Practical Swarming Model for Facilitating Collaborative Decisions	177
5.1.1	The Concept of Stigmergic Coordination	178
5.1.2	The Computational Model and Its Implementation	180

5.1.3	Some Experimental Results	183
5.1.4	Discussion and Concluding Remarks	187
5.2	An Application of Data Mining to Decisions in Labour Market (<i>By Claudiu Brândaş and Ciprian Pânzaru</i>)	188
5.2.1	A Framework of a Labour Market Decision Support System (LM-DSS)	189
5.2.2	Example	190
5.2.3	Comments	193
5.3	iDecisionSupport Platform (<i>By Ciprian Căndea</i>)	194
5.3.1	The Concept	195
5.3.2	Current Version	198
5.3.3	The Evolution	206
	References	207
	Index	213

<http://www.springer.com/978-3-319-47219-5>

Computer-Supported Collaborative Decision-Making

Filip, F.G.; Zamfirescu, B.-C.; Ciurea, C.

2017, XVI, 216 p. 34 illus., Hardcover

ISBN: 978-3-319-47219-5