

Contents

1	Introduction	1
1.1	Problem Statement	6
1.2	Summary of the Key Points Analyzed	8
1.3	The Structure of This Book	9
1.4	Methodology	12
	References	14
 Part I Fundamental Legal, Theoretical and Technical Issues		
2	Database Rights in Big Data and the Cloud—Main Legal Considerations	19
2.1	Introduction	19
2.2	On the Legal Issues of Databases	20
2.2.1	International Legal Framework	20
2.2.2	Database Protection in the European Legal Framework: Justification for the Double Scheme of Protection	22
2.2.3	The Necessity for the Legal Protection of Databases in the Cloud	25
2.2.4	Motivations for Introducing the Database Right in the EU	26
2.3	Database Rights: Legal Concepts and Main European Court Decisions	28
2.3.1	“Obtaining” and “Creating” Data and the “Spin-Off Doctrine” in the Eyes of the CJEU	33
2.3.2	Right to Access Information and “Sole Source” Databases	36
2.3.3	Sui Generis Right Term of Protection	38
2.4	Big Data and the Sui Generis Right Dilemma	38

2.5	Database Right and Contract Law	42
2.6	Summary and Interim Remarks	46
	References	46
3	Brokers, Clouds and Databases—<i>The Good, the Bad and the Ugly</i>	51
3.1	Introduction	51
3.2	Databases: Background and Technical Definition	52
3.2.1	A Few Examples of Databases in the Cloud	54
3.3	Cloud Computing and Brokerage Scenarios	55
3.3.1	Literature Review and Background Considerations	55
3.3.2	The Cloud Metaphor	57
3.3.3	Advantages of Cloud Computing: Main Capabilities	59
3.3.4	Disadvantages of Cloud Computing: Some Related Technical and Legal Issues	63
3.4	Cloud Deployment Models	64
3.4.1	Public Cloud	65
3.4.2	Private Cloud	66
3.4.3	Community Cloud	66
3.4.4	Hybrid Cloud	67
3.5	Cloud Service Models	68
3.5.1	Software as a Service (SaaS)	68
3.5.2	Platform as a Service (PaaS)	69
3.5.3	Infrastructure as a Service (IaaS)	69
3.5.4	Software Infrastructure as a Service (SaaS)	70
3.6	Cloud Service Brokerage	70
3.7	Summary and Interim Remarks	72
	References	73
4	Law and Economics—Five Core Principles in the Cloud	79
4.1	Introduction	79
4.2	Literature Review and Background Considerations: <i>The Three Schools of Thought</i>	80
4.2.1	Positive Law and Economics (Chicago-Style)	81
4.2.2	Normative Law and Economics (Yale-Style)	83
4.2.3	Functional School of Law and Economics (Virginia-Style)	84
4.3	Combining the Three Schools of Thought: <i>Five Core Principles</i>	84
4.3.1	Reducing Transaction Costs in the Cloud: “Filling the Gaps” in SLAs	85
4.3.2	Turning Technological Negative Externalities into External Benefits: The “Bee Metaphor”	88
4.3.3	“Ownership” Rights of Data as a Commons: Transforming “Tragedy” into “Comedy”	91

4.3.4	Institutional Alternatives: The Foucault Pendulum of “Imperfect Choices in the Cloud”	95
4.3.5	Social Network Analysis (SNA): Cloud Brokers as a Hub	97
4.4	Summary and Interim Remarks	99
	References	100

Part II A New Theoretical Framework

5	Plan-Like Architectures	109
5.1	Introduction	109
5.2	Plan Theory: We Are All Planning Agents	110
5.2.1	Shared Agency Theory: From Individual Plans to Joint Plans	112
5.2.2	Laws Are Plans	116
5.2.3	Simple Logic of Planning	117
5.2.4	Exclusionary Reasons	120
5.3	Plan Theory in the Cloud: Plan-Like Architectures	121
5.3.1	Brokers as Main Planners	121
5.3.2	Code and Architecture Design	124
5.3.3	SLAs as Plans	127
5.4	Summary and Interim Remarks	128
	References	129
6	Plans, Brokers and Trust	133
6.1	Introduction	133
6.2	Literature Review and Background Considerations	135
6.2.1	Attitudes of Trust (and Distrust) Within Plan Theory	138
6.2.2	Different Notions of Trust: A Kaleidoscopic and Critical View	141
6.2.3	Delimiting the Concept of Trust	153
6.3	The Role of Cloud Brokers for Strengthening Mutual Trust	155
6.3.1	The Double Nature of Trust	158
6.3.2	Deferring Accountability to Cloud Brokers	160
6.3.3	Risk, Vulnerability and Threat	161
6.3.4	Trust and Reputation: Beyond Track Records	163
6.3.5	Gaining User’s Trust Through Websites and Social Networks	166
6.3.6	Blockchain 2.0: The “Trust Machine”	168
6.4	Trust and Plan-Like Architectures: How It All Fits Together	170
6.5	Summary and Interim Remarks	171
	References	172

7	Framing Choice Architectures	183
7.1	Introduction	183
7.2	Literature Review and Background Considerations	185
7.2.1	Two Ways of Thinking: “Fast” and “Slow”	188
7.2.2	Nudge Theory and Cloud Brokerage Architectures	189
7.2.3	Behavioral Market Failures, Different Types of Nudges and Soft Paternalism	194
7.3	Turning Nudges into Simpler and More Effective SLAs	196
7.3.1	Warning Signs for Risk Management in Cloud Brokerage	198
7.3.2	Default Rules and Information Disclosure as Prime Nudges	200
7.4	The Relation Between Plans, Nudges and Choice Architectures	202
7.5	Summary and Interim Remarks	203
	References	203
Part III A New Contractual Model		
8	New Template for SLAs	211
8.1	Introduction	211
8.2	Background Considerations: SLAs and XML	213
8.3	Empirical Study and Optimized Solutions	215
8.3.1	Database Rights and the “Legal Glocalization” Conundrum	217
8.3.2	Click-Through or Negotiated Terms? A Blended Approach	218
8.3.3	“Ownership” Rights in Consumer Data	221
8.3.4	“Ownership” Rights in Biological Data	225
8.4	A Sui Generis Contractual Framework	232
8.4.1	Automated Framework: The “Dead Man’s Switch”	234
8.4.2	XML-Based Description Schema	235
8.4.3	Brokerage Workflow Process	237
8.4.4	Unified Modeling Language and Pseudo-code	240
8.4.5	Legal Questions for the Extraction of the Pseudo-code	242
8.5	Summary and Interim Remarks	254
	References	254
9	Towards a Legal Risk Assessment	261
9.1	Introduction	261
9.2	Risk Assessment: Literature Review, Motivation and Justification	263
9.3	Risk Assessment Methodology	267

9.3.1	High Level Analysis of the System	268
9.3.2	Identifying the Assets Involved	268
9.3.3	Identifying the Threats in Each Cloud Deployment Scenario	268
9.4	Embracing Legal Risks and Enhancing Legal Interoperability	269
9.5	Conventional Databases Versus Big Data: Striking the Right Balance	272
9.5.1	Territorial Scope of Protection	273
9.5.2	“Ownership” Rights of New Data Generated by Big Data	274
9.5.3	Lack of International Legal and Contractual Standards	275
9.6	Risk Assessment Techniques and Typical Actors Involved in Brokering WS-Agreements	276
9.6.1	Typical Actors Involved	276
9.6.2	Risk Assessment Techniques	277
9.7	Risk Inventory Design for the Identification of Legal Risks	278
9.8	Different Stages of Risk Assessment in Cloud Brokerage Scenarios (CBS)	280
9.9	Use Case Scenarios: Examples	283
9.9.1	Use Case 1: Cloud Services in Business Transactions	285
9.9.2	Use Case 2: Genetic Research Projects Within Clinical Trials Scenarios	289
9.10	Summary and Interim Remarks	292
	References	292
10	Conclusion—Main Findings and Contributions to the Current Knowledge	297
10.1	Theoretical Contribution	297
10.2	Scientific Contribution	298
	References	301
Index	303