DERECHO DE BLOCKCHAIN Y DIGITALIZACIÓN DE LA SOCIEDAD

ALASTRIA MISSION AND VISION

A multidisciplinary research

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ALASTRIA MISSION AND VISION: A multidisciplinary research

Coordinator: JAVIER IBÁÑEZ JIMÉNEZ

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INDEX

FOREWORD 15

PART ONE: GOVERNANCE 23

ALTERNATIVE DISPUTE RESOLUTION MECHANISMS (AS PART OF THE ALASTRIA GOVERNANCE) - Ismael Arribas 25

I. Introduction 25
II. Definitions and characterization of ADR solutions in the permissioned blockchain context 26
III. The fundamentals of arbitration as an optimal solution in the permissioned-blockchain governance context 27
IV. A proposal for Alastria 29
1. Specimen of inception 29
2. Components 30
3. Minimal common legal requirements 31
4. Challenges and recommendations for Alastria 32
5. Case of use: wine plantations 33
V. References 34

ALASTRIA AS A CASE OF INTERNET GOVERNANCE - Moisés Barrio Andrés 35

I. Introduction 35
II. From technical governance to social governance 38
2.1. ICANN's creation 39
2.2. The creation of the Internet Governance Forum (IGF) 41
2.3. ICANN's globalisation 42
III. Concluding remarks: lessons from cyberlaw for Alastria's governance 44

Ir a editorialreus.es

VALIDATION AND GOVERNANCE IN AN ALASTRIAN TESTNET NODE - David Contreras, José Luis Gahete, Israel Alonso, And David Alfaya 47

I. Introduction to Alastria architecture 47
1. Quorum consensus protocol 48
2. Transactions 50
II. Alastria members and nodes 52
1. Alastria Nodes Requirements 52
2. Alastria Nodes Configuration 53
III. Alastria Operation 56
1. Regular introspection 56
2. Network analysis 57
3. Results 57
IV. Conclusions and future works 60

ALASTRIA GOVERNANCE POLICIES AND ETHICS - Javier Ibáñez Jiménez 61

I. Introduction 61
1. The relationship between agency problems, conflicts of interest and ethics from a general and legal societal perspective 62
II. Ethics beyond governance organization in DLT permissioned networks 63
III. The case of Alastria: conflicts of interest, implemented controls and alternative solutions in accordance with an ethical acceptable consensus 67
1. The bylaws of Consorcio Red Alastria, a private-law association 67
2. Conflicts of interest and related policies 68
3. Ethical code of the association 69
IV. Specific components of governance in the Alastria model: agency problems in Alastria as a DLT associative consortium and node community for the development of a permissioned blockchains 71
1. Authority of nodes and transaction validation in Alastria 71
2. Conflicts of interest in the Alastria on-chain governance 74
3. Off-chain governance and agency problems in the Alastria model, and their meta-juridical or extralegal ethical and social projection 76

REWARDING HONEST VALIDATORS IN ALASTRIA - Pietro Marchionni 81

I. Introduction: consensus among nodes in DLT 81
1. Consensus algorithm in Alastria: fault tolerance and node voting 81

Ir a editorialreus.es

2. The need to define a rewarding system for validating activity in a permissioned network 82
3. Objectives 82
II. Alastria rewarding model 82
1. The optimal characteristics of a validator node as a prerequisite to set the optimal rewarding model 83
2. Alastria Rewarding Measure Algorithm 84
2.1. Key building elements 84
2.2. ARM formula 86
2.3. ARM calculation and simulation 86
2.4. Alastria Rewarding Measure strategy and marketing 87

THE VALUE OF LEADERSHIP IN ALASTRIA GOVERNANCE - Salvatore Moccia 89

I. Leadership as a matter of research 89
II. Analysis: the evolution of leadership standards and conception 90
III. Alastria governance seen from the entrepreneurial leadership viewpoint 92
IV. Conclusion 95
V. References 95

PART TWO: DIGITAL IDENTITY 97

THE CONCEPTUAL LEGAL FRAMEWORK OF ALASTRIA IDENTITY - Ignacio Alamillo Domingo and Julián Valero Torrijos 99

I. Contents 99
II. The convenience of a conceptual legal framework for the Alastria self-sovereign identity initiative 100
1. The alignment of the Alastria identity with the regulatory framework for the usage of identification systems by the national public sector bodies 100
2. The influence of the interoperability framework for cross-border electronic identification in the European Union: the eIDAS Regulation 103
3. The convenience of offering support for compliance with the formal identification obligations contained in anti-money laundering regulations 110
III. Guidance for the Alastria trust framework and identity interoperability agreements 111
IV. References 112

Ir a editorialreus.es

CHARACTERIZATION AND IMPORTANCE OF CYBER-IDENTITY IN PERMISSIONED NETWORKS - Elena Davara Fernández de Marcos 115

I. Introduction to the concepts of cyber-identity and permissioned internet networks 115
1. Cyber-identity as a digital personal identity 115
2. Permissioned networks 116
II. Data security and vulnerabilities: the need of effectiveness in regulatory implementations, and the role of blockchain within this context 117
1. The role of the DLT 118
2. Introductory GDPR issues 119
2.1. Profiles 119
2.2. Biometric data 120
3. Self-sovereign identity in the DLT context 122
4. A word on the Alastria self-sovereign identity 123

THE VALUE OF ALASTRIA IDENTITY FOR PUBLIC ADMINISTRATIONS - Pedro Martín Jurado 125

I. Blockchain and improvement of efficiency in Public Administrations 125
II. The digital identification of citizens and the functions of public administrations 126
1. Self-sovereign identity in the relations between public administrations and citizens 127
2. The European Self-Sovereign Identity Framework 128
3. Some issues on the accreditation of European citizens, and the initiatives of the European Commission 130
4. Reference to the Alastria network within the current public permissioned Blockchain identity context 131

PART THREE: SUPERSTRUCTURES 133

SMART CONTRACTS AND DECENTRALIZED APPLICATIONS IN ALASTRIA: THE CASE OF SPANISH WINE - M. Aymo, C. Bellón, and R. Sáenz-Díaz 135

I. Idea in brief 136
II. Introduction 136
III. The wine industry in Spain 138
IV. Use case: exporting Rioja wine. Situation today 140
1. The Alastria Wine Solution 142
2. Supply Chain Management Issues 143

Ir a editorialreus.es

3. Alpha version of the Alastria Wine Solution. Application to Rioja wine exports 144
V. Conclusions for all stakeholders 149
THE USE OF SMART CONTRACTS FOR PUBLIC TENDERS IN THE REGIÓN OF ARAGÓN (SPAIN) - M. A. Bernal Blay 151
I. Blockchain for the public sector 151
II. A distributed ledger for offers in public procurement 152
1. Context and initial objective 153
2. Smart contracts for the evaluation of the offers 154
III. Some tips about the project: the public procurement of innovation 154
IV. Other use cases 156
ACCOUNTING AND NON-FINANCIAL FIRM DATA TOKENS IN ALASTRIA - E. M. Ibáñez 157
I. A word on tokens as a historic source of accountancy registration and record of transactions 157
II. DLT Utility in accountancy 158
III. the digital audit of accounting information in public permissioned networks 163
1. Stakeholder integration and benefits in public permissioned blockchains by audit smart contracts: a preliminary consideration 165
2. A sample of registered auditable transaction in the Alastria permissioned blockchain 166
IV. Preliminary findings 167
V. References 168
PRIMARY AND SECONDARY MARKET TOKENS IN ALASTRIA: THE CASE OF OLIVE OIL TOKENS - Antonio Partal Ureña 171
I. Blockchain and Alastria market utilities 171
II. A word on market tokenization 172
III. A project for olive oil tokens on the Alastria T Network 173
1. Traceability functions 174
2.The olive oil token market 177
IV. Conclusion 182

PART FOUR: PROOFS OF CONCEPT 183

ALASTRIA SMART CONTRACTS FOR THE WOMEN STARTUP COMMUNITY (WSC) - Teresa Alarcos Tamayo 185
I. The Women Startup Community (WSC) and the feminine talent in the digital era, and the transformation of entrepreneurship 185
II. The goal of increasing the transformational and social power of women's businesses and the inspiration of woman leaders in the

Ir a editorialreus.es

digital era 187
III. The Alastria-WSC connection and the fundamentals of the TT Trust Token 191
SECURITY, ORDER AND FREEDOM IN THE BLOCKCHAIN ERA: THE CASE OF SPAIN - Pablo Gallego Rodríguez 193
I. Foreword 193
II. Public order and security 195
III. Alastria multisectorial consortium and its contribution to guarantee effective protection of public constitutional order and public security 198
REWARDING RECYCLING PLASTIC PROOF OF CONCEPT WITH TOKENIZATION AND SMART CONTRACTS IN ALASTRIA - Josep Lluis de la Rosa 203
I. Introduction: Issue at hand 204
II. Hypothesis and precedents 205
2.1. Discounts and presents aren't working enough 206
2.2. Lotteries redistribute the individual rewards 207
2.3. Lotteries and rewards programmes need of transparency 207
III. Tokenization as a Type of Circular Economy 208
IV. Minimum Valuable Product (MVP) Design 211
4.1. The proof of work 211
4.2. Tokenising the tax discount 212
4.3. Tokenising the Special Lotteries 213
4.4. Smart contracts for lotteries 213
4.5. Illustrative use case 215
V. The platform approach and implementation 215
VI. Results 217
VII. Conclusions 218
VIII. Acknowledgements 218
IX. About us 219
X. References 219
BOOSTING COOPETITION THROUGH ALASTRIA, DATA SHARING AND ARTIFICIAL INTELLIGENCE - Julen Milan and Antonio D. Masegosa 221
I. Introduction 221
II. Artificial intelligence and the data collection problem 222
III. The key role of Alastria in data sharing as a distributed ledger 223
IV. Related work 224
V. Alastria for boosting coopetition through data-sharing and Artificial Intelligence 226
1. Coopetition and AI development challenges in blockchain recent

Ir a editorialreus.es

environments 226
2. The Alastria model and its advantages for the implementation of AI methods 228
3. Existing AI models replicable in the Alastria network 229
VI. Conclusions and future work 230
VII. References 231

BLOCKCHAIN, REAL ESTATE ASSET TOKENIZATION AND ITS PROTECTION BY THE LAND REGISTRY - Jesús Sieira and Jimena Campuzano 233

I. Tokenization of real estate assets under Spanish law 233
II. Taking real estate transactions to the blockchain 235
III. Land Registry: Legality control and *erga omnes* protection 237
IV. The Land Registry as the link between the "on-chain" and "off-chain" world: Land Registry protection and publicity of tokenization 237
V. Legal configuration of tokens representing rights in rem on real estate 240
VI. Effects of the entry of Tokenized Rights in rem to the Land Registry 243
VII. Conclusion 244
VIII. References 244

PART FIVE: CIVIL LIABILITY AND RELATED LEGAL ISSUES 247

THE PRINCIPLES OF ALASTRIA UNDER SPANISH CIVIL LAW - Mirari Barrena 249

I. Legal entity: Association. The kind of legal institution chosen for Alastria constitution 249
II. The Alastria legal principles 250
1. Open access of members 250
2. Open-source software development 251
3. Public and permissioned characterization of the network 251
4. National body of associated members 251
5. Technological neutrality 252
6. Multi-sectorial membership 252
7. Interoperability 253
8. Collaboration and incentive systems 253
9. Decentralization and distributed power 254
9.1. General Assembly: 255
9.2. Board of Directors: 255
9.3. Commissions 256

Ir a editorialreus.es

10. Public-service orientation 256
ALASTRIA MULTILATERAL CONTRACT: A CIVIL LAW APPROACH - Carlos de Cores 259
I. Introduction 259
II. Collaborative nature of the Alastria consortium and its incidence on its liability model 261
1. New paradigms of liability in the information society 261
2. Multilateral contracts and Alastria 262
3. Different models of liability according to different relationship . 265
3.1 Relationships among Alastria's members 265
3.2. Relationships with third parties 266
III. Liability related to the services rendered by the consortium and or its members 268
1. Concept of information society services 268
2. Taxonomy of information society service providers 268
3. Alastria as an information society service provider 269
4. Liability of society information service providers 270
5. Liability "by design" 271
IV. Conclusion 272
ROBOTS, SMART CONTRACTS AND CIVIL LIABILITY IN ALASTRIA - M. Reyes Corripio Gil-Delgado 273
I. Robots and civil liability within a DLT or blockchain operative context: a preliminary approach 273
1. A civil personality for robots 274
2. A strict liability system 278
II. Alastria Blockchain and Smart Contract 280

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FOREWORD

The objective of this research is the study of the case of Alastria as a blockchain national ecosystem from the standpoint of relevant aspects for multidisciplinary research.

Created in September of 2017, Alastria is the first worldwide ecosystem designed to create public permissioned DLT systems.

The researchers participating herein were appointed in December of 2018 as a response to a call for papers from the Alastria CITT (Comisión de Investigación y Transferencia Tecnológica) to the Spanish blockchain research community present in Alastria, composed by universities, research centres, Consorcio Red Alastria associated enterprise members, and researchers rendering service in public sector institutions.

Thus, Alastria CITT opened a nation-wide call for research to cover different legal, economic and technological/engineering aspects concerned by the consortium, legally constituted as a Spanish private-law association named Consorcio Red Alastria.

The primary research contents programmed to develop this work were designed to cover the following topics concerning Alastria ecosystem and DLT networks:

1. Governance, encompassing administration of DLT networks and management and ruling of Alastria networks, particularly in the realm of on-chain and off-chain rules.
2. Self-sovereign digital identity (SSI) and specifications of the Alastria SSI system in progress.

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3. Superstructures on upper architecture layers, namely smart contracts, tokens and decentralized applications.
4. Cases and proofs of concepts concerning DLT-registered data notarization, verification and certification.
5. Civil liability issues concerning management and administration of the public decentralized networks.

Research area managers were appointed on 20th January of 2019, and they started planning the research areas. Successive task developments took place between January and June of 2019. Despite the initial prevision of delivering and final conclusions of researchers by the end of June, the reform of the Consorcio Red Alastria association opened an inner period of reflection led by the organs of the consortium (mainly, its board of directors and core managing teams, together with concerned committees and commissions), resulting in the impossibility of the scheduled public presentation of the research conclusions in Autumn. Until the end of 2019, the complexity and deepness of the reform of Alastria bylaws and articles of association, together with newly issued self-regulations (guidelines and policies for governance, summarizing) recommended the revision of the ongoing research.

The tasks restarted in February of 2020, concluding by the end of April. By that time, definitive versions were delivered and final general conclusion were obtained. Public presentations will presumably be replaced by private website presentations, as the COVID 19 crisis delays ordinary presential activity in many affected countries, not only in Spain. Communication among members will surely be enhanced by online channels, fostering Alastria reports and other communication tools for the optimal spreading of research program conclusions, enabling Alastria member organizations to perform an adequate interaction on relevant debates concerning the researched matters[1]. In accordance

[1] The list of appointed researches as of May 26th of 2019, conveniently bundled and clustered by research matters, was composed as follows:

1. ALASTRIA GOVERNANCE
Alfaya, D. (ICAI Telematics and Computer Sciece Dept, UP Comillas)
Alonso, Israel (ICAI Telematics and Computer Sciece Dept, UPComillas)
Arribas, Ismael (Alastria Standards Committe / ISO-ETSI-ITU member)
Barrio, Moisés (Consejo de Estado, Spain / UPC FinTech Observatory)
Contreras, David (ICAI Comillas Blockchain node –Madrid-)

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with the academic preferences, research skills and organization of competent departments in the concerned universities and research centers, the scheduled distribution of tasks was configured as follows:

Gahete, José Luis (ICAI Comillas Blockchain node –Madrid-)
Ibáñez, Javier (Alastria Board and Legal&CITT Committee / UPC FinTech Observatory)
Marchionni, Pietro (CEN-CENELEC Blockchain FG/ Agenzia per l'Italia Digitale)
Ruiz, Jesús (Alastria Chief of Technological Research)

2. ALASTRIA SSI IDENTITY
Alamillo, Ignacio (Murcia University/Alastria DI Committee working group)
Davara, Elena (Davara & Asociados/UP Comillas FinTech Observatory)
Martín, Pedro (Advisor, Spain's Ministry of Economy / Policy Group, EU Blockchain)
Valero, Julián (Murcia University/ Alastria DI Committee working group

3. SUPERSTRUCTURES
Alarcos, Teresa (W Startup Community –Madrid-/ Alastria Ecosystem)
Aymo, Mahmoud (Comillas Pontifical University -Madrid- FInTech Observatory)
Bernal, Miguel Ángel (DG Contratación, Aragón Government –Spain-)
Bellón, Carlos (Comillas Pontifical University –Madrid-/ FinTech Observatory)
Ibáñez, Eva María (UNED, Madrid)
Moccia, Salvatore (UNIR, La Rioja / Alastria Ecosystem)
Sáenz-Díaz, Rocío (FinTech Observatory, UPC -Madrid-/ FinTech Observatory)

4. NOTARIZATION, CERTIFICATION, PoCs
Campuzano, Jimena (Property Registrar, College of Spain)
Fernández, Cristina (Deusto University, Bilbao / UP Comillas FinTech Observatory)
Gallego, Pablo (CEU University, Madrid)
Menéndez, Moisés (Everis, NTT Data Group / UP Comillas FinTech Observatory)
Rosa Esteva, Josep Lluis de la (U. de Girona)
Sieira, Jesús (Property Registrar, College of Spain)

5. CIVIL LIABILITY
Barrena, Mirari (Deusto Business School –Madrid-)
Castro, José Luis (Autónoma University –Madrid-)
Cores, Carlos de (Montevideo University – Uruguay-)
Corripio, Reyes (Comillas Pontifical University - Madrid-)
Sanz, Pablo (FinTech Observatory, UPC -Madrid-).

By the end of 2019, Prof. Dr. Partal (University of Jaén) was incorporated to the group, and Mr. J. Ruiz changed his position from author to general supervisor of tasks as Alastria Chief Research Officer (CRO).

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TASK DISTRIBUTION

Economic
Legal
Technological
Philosophical

Scientific predominant approach of the proposed section /contribution

1. Governance		
Arribas, I.	Alternative dispute resolution mechanisms, off and on-chain	Legal
Barrio, M.	Alastria as a case of Internet governance	Legal
Contreras, D. / Gahete, J.L./ Alonso, I. / Alfaya. D.	Validation and governance in an Alastrian testnet node	Technological
Ibáñez, J.	Alastria governance policies and ethics	Philosophical
Marchionni, P.	Rewarding honest validators in Alastria	Technological
Moccia, S.	The value of leadership in Alastria governance	Philosophical
Ruiz, J.	Alastria in-chain: automated governance issues	Technological
2. Digital identity		
Alamillo, I. / Valero, J.	The conceptual legal framework of Alastria identity	Legal
Davara, E.	Characterization and importance of cyber-identity in permissioned networks	Legal
Martín, P.	The value of Alastria identity for public administrations	Economic
3. Superstructures (Dapps, tokens)		
Aymo, M. /Bellón, C. /Sáenz-Díaz, R.	Smart contracts and decentralized applications in Alastria: the case of Spanish wine	Philosophical

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Bernal, M.A.	The use of smart contracts for public tenders in the region of Aragón (Spain)	Legal
Ibáñez, E.M.	Accounting and non-financial firm data tokens in Alastria	Philosophical
Partal, A.	Primary and secondary market tokens in Alastria: the case of olive oil tokens	Philosophical
4. Proof of concept		
Alarcos, T.	Alastria smart contracts for the Women Startup Community	Economic
Gallego, P.	Security, order and freedom in the Blockchain era: the case of Alastria	Economic
Martínez, R./de la Rosa, J. Ll.	Software basis for the development of a PoC in Alastria	Technological
Milan, J. / Masegosa, A.	Boosting coopetition through Alastria, data sharing and artificial intelligence	Technological
5. Civil liability and related legal issues		
Barrena, M.	The principles of Alastria under Spanish civil law	Legal
Campuzano, J. / Sieira, J.	Blockchain, real estate asset tokenization and its protection by the land registry	Legal
Cores, C.	Alastria multilateral contract: a civil law approach	Legal
Corripio, R.	Robots, smart contracts and civil liability in Alastria	Legal

Concerning the contents of the research and the characterization of its multidisciplinary methodology, it is to be noted that:

a) The authors of each piece of research (equivalent to an article of a journal or briefing for a presentation within a symposium or congress dedicated to DLT specialists) have worked independently, limitating research coordination to support and supervise diverse efforts made in the inner domain of different parts of research. This leads to a variety of methods and approaches sustaining the multidisciplinary (technical, legal, economic and philosophical) vision of the complex Alastria reality, where coexist under the same denomination:

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(i) a public-permissioned blockchain community and ecosystem, which is a dynamic force encompassing more than five hundred institutions, both public (including Administrations) and private, profit and non-profit;

(ii) a conglomerate of coexisting DLT networks, although most of the papers refer to the only operative existing network in Alastria by 2019, the so called Telsius (since 2020, T) Quorum-Ethereum network.

(iii) a private (civil) law association, ruled by Spanish Law of Associations, as the governing entity of the consortium that represents the blockchain ecosystem, submitted to a legal form (the so called *Consorcio Red Alastria*).

b) The selection of contents of the researches and its division (governance, digital identity, infrastructures, proofs of concept and specific legal issues) was made in accordance with the premises and assumptions made by international standardization organisms, mainly the International Standards Organization (ISO) within the context of its Technical Committee 307 (hereinafter ISO / TC 307) and the International Telecommunications Union (hereinafter ITU – T) and its focus group on Distributed Ledger Technology (hereinafter FG DLT). The related working groups of the European Committee for Standardization (CEN), and the European Committee for Electrotechnical Standardization (CENELEC) have also been considered to this respect.

c) The justification of the selected groups of research matters resides on the grounds of the DLT structure. **Firstly**, governance has been considered as the axis of the organization and structuration of the architectural mechanisms of the blockchain networks, in the double field of inner technical administration (on chain governance, in the jargon), and external or outer organization of the architecture, which is essential in public permissioned DLT networks as Alastria's, wherein it is crucial to balance public confidence supplied by automated protocols with rules like Istanbul Byzantin Fault Tolerance, with legal security granted by human non automated or manual means, so as to provide additional confidence for legal purposes, though

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paradoxally this kind of recentralization led by human intervention is sometimes criticized on the basis that it would betray the automated structure of code execution characterizing the distributed ledger technology. The papers composing this part of the book treat on different ethical, legal, economic and technological aspects of the Alastria governance, from gas incentives to internet-related governance issues, as well as enforcement or litigation relevant aspects.

The second group of papers contain issues on digital identity, in order to debate around this crucial component of data communication in a permissioned blockchain, currently aspiring to empower legal and physical persons with autonomous resources for digital identification when executing transactions. The Alastria networks are about to use a specific self-sovereign identity system, recently proposed to EBSI and ESSIF European partners to be implemented at the EU level, whose characterization and legal structure is detailed in a couple of specific papers. Notwithstanding this, another specific paper shows the potential of the public governmental utilization of the self-sovereign identity model, showing some Spanish public administration experience that took place within the last two years.

Thirdly, superstructures on the Alastria DLT networks have been analyzed under different papers having focused mainly on the smart contract and upper layers of their architectures. Some of the works therein outline the economic advantages that could be obtained by economic actors deploying smart contracts and decentralized applications or DApps. To this respect, several cases of use currently under development are brought to this part of the book in order to show specific utilities of smart contracts in terms of contract execution accuracy and speed, encompassing different sector or industry cases under development. The case of Aragón public-contract utilities on Alastria layers is also examined to compare private with public advantages of these network superstructures.

In a fourth group of works we read those dealing with proofs of concept. The intention of this part is not showing concrete proofs actually running on the T Alastria network or about to

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be implemented by associated members of the ecosystem, but reflect on theoretical universal aspects of such proofs from different ecosystemic viewpoints, like those of startup enterprises and communities, citizens requiring financial inclusion, citizenship in general as a political ecosystem, or public registries and other public-law related relevant actors who must supply legal certainty to transactions. Without prejudice to these issues, a technical paper included within this section studies the software bases required to develop a proof of concept in Alastria, completing a wide range of theoretical multidisciplinary approaches to proofs of concept in a public permissioned DLT environment.

Finally, in the fifth part of this conjoint work we read crucial queries and answers on civil liability, statutory provisions and legal principles governing Alastria as a legal private-law moral person, and other related relevant private-law issues like real estate tokens, analysed from the perspective of the civil law or Roman legal code system in force in Spanish jurisdiction.

d) The multidisciplinary combination of papers facilitates a thoroughly holistic understanding of the national consortium from different academic and scientific approaches. However, basic standards applied to the structure of the research pieces have been respected by all authors irrespective of the peculiarities of their methodology, in order to grant sufficient homogeneity and consistence to the different sections and therefore preserve the essential orientation of the whole work to explain the mission and vision of Alastria as a blockchain consortium, as a community ecosystem and as a coordinated bunch of DLT networks, as explained below.

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Governance of permissioned blockchains is a key issue for the short-term success and further development and consolidation of decentralized ledger technology (DLT) general purpose networks. The present book, written by thirty authors and directed by Prof. Ibáñez, one of the Consorcio Red Alastria blockchain community cofounders, shows how this pioneer worldwide public-permissioned national ecosystem, Alastria, is to be governed and organized. The different sections of this collective work analyze the mission and vision of Alastria from a multidisciplinary viewpoint encompassing the technological, economic and legal perspectives of its mission and vision. This collective task also encompasses key issues concerning self-sovereign digital identity, decentralized applications, smart contracts and other legal issues related with the creation, expansion and strategic anchorage of the aforementioned ecosystemic community, unique in Europe and in the world, showing the way for other permissioned consortia to boot in the forecoming years.

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