BABEŞ-BOLYAI UNIVERSITY

THE FACULTY OF ECONOMICS AND BUSINESS MANAGEMENT

THE DOCTORAL SCHOOL OF ECONOMICS AND BUSINESS MANAGEMENT

THE STUDY OF BLOCKCHAIN TECHNOLOGY APPLICATION AND GOVERNANCE

Scientific advisor: Prof.univ.dr. Răzvan Liviu NISTOR

Doctoral student:

Chen Kai

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Summary

With the popularity of blockchain technology (BCT) and the more appealing applications of BCT in various domains, from the perspective of a more scientific proper management structure of the BCT-involved projects, what is required is a comprehensive understanding of the BCT and of the relevant technologies, including Bitcoin, decentralized autonomous organizations (DAOs), smart contract, and a thorough investigation of the BCT projects' problems and solutions in management. The present doctoral dissertation, entitled *The Study of Blockchain Technology Application and Governance,* begins by defining the fundamental terminologies and concepts of BCT, and reveals the evolvement of BCT, from the moment it played the role of the supporting technology for cryptocurrencies, and especially its development and application in the financial sectors, in which it improved payment and settlement, value transaction, and supply chain finance, to its applications in other industries and domains, such as the supply chain, education, and data verification. With the objective of mapping the BCT application status in the Chinese, European, and Romanian market, people working in BCT related companies and organizations are interviewed, data are collected, and the comparison between the European, Romanian and Chinese BCT ecosystems is conducted, in order to research the BCT application situations in different markets, the BCT business models, challenges, impact of COVID-19, general BCT project managerial suggestions, BCT project assessment methods, and the prospects for the future applications in the Romanian and global markets.

Chapter 1 presents the introduction of the critical definitions and clarifications of the fundamental BCT-relevant terminologies. With the involvement of the specific technology and the increasing number of domains that pertain to its application, blockchain is not merely the basic technology supporting Bitcoin and other cryptocurrencies; it additionally refers to the primary and core technology supporting

many different industries. The most critical consensus mechanism, the smart contract, and the significant ideology, namely decentralization, are presented, together with their relationships, after a more in-depth exploration. This part outlines the respective philosophy and research methodology, including descriptive research methods, comparative research methods, historical research methods, case study methods, interview survey methods, inductive research methods, and deductive research methods. The data resources are introduced.

In chapter 2, a more detailed BCT evolution is presented, starting with the emergence of Bitcoin. The BCT working theory and consensus mechanism are analyzed. Several outstanding properties of the BCT are studied. These properties promote the decentralized, transparent, and efficient work in the economic domain. The research conducted on the BCT development model, types, and phases ensures a comprehensive understanding of BCT. The study of decentralized autonomous organizations (DAO) presents the progressive ideology in the current centralized financial sector, as well as in many other centralized industries. The concepts of centralization and decentralization in management are mutually beneficial. Both should be utilized in order to implement a successful BCT management system. Further on, the present thesis discusses additional details regarding the smart contract and its potential in practice. The smart contract, the improved supporting and extended technologies, together with the favorable policies, are promoting the BCT application to a higher level.

Chapter 3 demonstrated the general BCT application in the global and Chinese markets, in various industries and domains, especially in the financial sector. The progress made in the financial market is truly significant, as it has improved payment, settlement and clearing, value transactions, and supply chain finance. With the successful application of the practice in the financial sector, more industries have begun implementing the BCT. In the research, the BCT application in the education sector is studied in order to identify the means by which BCT can be used and the potential benefits thus obtained. The efficiency, transparency, data security, data reliability, and other aspects of work

can be improved. The case study of Vestchain. Ltd presents the detailed BCT application in data storage and verification.

Chapter 4 contains the practical research conducted on the BCT development and application in the Romanian market, the Chinese market, and the European market, through interviews with people working in the BCT relevant organizations, such as software companies, cryptocurrency companies, universities, and research institutes. The comparison is implemented from the perspectives of policy support, supervision, research focus, and the application domains in the European and Chinese BCT markets. The challenges for the BCT governance are studied and presented. For these challenges, the corresponding managerial suggestions are also put forward. The pandemic has had an immense impact on the global economic activities, including the BCT development, which is studied as well. In order to outline comprehensive BCT business models, many BCT relevant companies are studied, including the 30 companies in Romania. The 30 companies are analyzed from the perspectives of Geographical Distribution, Application Industry Distribution, International and Domestic BCT Company Rate, and the BCT Business Model, to find out the lessons for the BCT company governance. The MAPS model is studied and adapted for the Romanian BCT-relevant projects to verify its effectiveness in Romania. 4 companies in the Romanian BCT industry are interviewed and studied, in order to assess the effectiveness of the modified MAPS model. The prospects of the BCT application in various domains in the Romanian market are thoroughly argued. From the perspective of development, the Romanian BCT market has significant potential, as many disciplines present the demand and possibility for BCT application, and more industries have started BCT applications. Suitable monitoring and regulatory measures for the Romanian BCT market are necessary in order to reduce the number of criminal affairs. The prospects for the BCT industry in Romanian and global markets are put forward.

Key words: blockchain technology, management, decentralization, application status, business model, assessment, prospects

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