INVESTIGATING THE POSSIBILITY OF APPLYING BLOCKCHAIN TECHNOLOGY FOR CONSTRUCTION PROJECTS DURING THE FINANCIAL CRISIS IN SRI LANKA

Dissanayakage Sajith Lakshan Perera

(209191H)

Master of Science in Construction Law and Dispute Resolution

Department of Building Economics

Faculty of Architecture

University of Moratuwa

Sri Lanka

August 2024

DECLARATION

I formally declare all of this to be my own work and, as far as I know, and believe it as, it does not contain previously written or written graduate material or diploma material, except where the acknowledgement is made in the text. This is not unconsented.

Further, I acknowledge the intellectual contribution of my research supervisor, Ch. QS. Indunil Seneviratne for the successful completion of this research dissertation. I affirm that I will not make any publication from this research without the name(s) of my research supervisor as contributing author unless otherwise I have obtained written consent from my research supervisor.

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Ch. QS. Indunil Seneviratne Date

Dissertation Supervisor

DEDICATION

To My Beloved Wife, Son, Daughter and Mother who have being the utmost inspiration and light of my life……

ACKNOWLEDGEMENT

This research study is an outcome of much dedication and remarkable assistance given by many personnel and organizations, who contributed in ample ways to make this research a success. In fact, there were number of people behind me, who supported and guided me to the correct path and genuinely wished my success. I should say that the following words would not be enough to express my greatest gratitude for their tremendous help which was an enormous strength to me. Nevertheless, I take this opportunity to convey my gratitude to all of them.

First and foremost, I would like to forward my sincere gratitude to my supervisor, Ch. QS. Indunil Seneviratne, Senior Lecturer, Department of Building Economics, Faculty of Architecture, University of Moratuwa for his kind and insightful guidance without which this work would not have been possible. I take this opportunity to thank, Ch. QS. Prof. (Mrs.) Anuradha Waidyasekara, Head of the Department, Ch. QS Vijitha Disaratna, Post Graduate Coordinator & Prof. (Mrs.) Yasangika Sandanayake, former Post Graduate Coordinator of the Department of Building Economics as well as Post Graduate Division and Faculty of Post Graduate Studies for the support extended. Furthermore, I pay my heartiest gratitude to all non-academic staff members of the department of building economics for the valuable help given.

I must be thankful to all those who supported from the industry with their valuable insights in obtaining the data. Special thanks go to all the interviewees and industry experts who gave me an immense support and corporation to complete a successful data collection by sharing their valuable knowledge and experiences with me.

Last, but not least, but not least, I express my heartfelt gratitude to my family, my batch mates and all others who were with me during this study for giving their utmost support, genuine advice and continuously motivating me to carry out the work successfully.

ABSTRACT

The construction industry is crucial to the nation's economic development, makes substantial contribution to Gross Domestic Product. However, the ongoing economic crisis, reached to its climax in 2022, had a severe impact on Sri Lanka's construction sector due to significant currency depreciation and rising inflation. The increase in foreign debt and a decrease in tax revenues had led to the suspension of major infrastructure projects.

During the past, different countries adopted various strategies while managing the crisis. Blockchain is a technology which has the potential to revolutionize the structure of all accessible networks in the future. Construction companies are increasingly interested in utilizing blockchain to reduce project costs, improve planning, and minimize waste through modern construction technologies and innovative practices. Therefore, a thorough investigation is needed to explore the feasibility of applying blockchain technology for construction projects during Sri Lanka's financial crisis.

The study collected both qualitative and quantitative data, utilizing primary and secondary sources. Preliminary interviews were conducted to assess the relevance of information gathered from the literature review. Subsequently, a questionnaire survey was conducted among industry professionals in Sri Lanka, achieving a 46% response rate, to identify the applicability, barriers, and benefits of blockchain-based applications.

The research concluded that blockchain-based smart technologies could be applied to construction projects for smart contracts in payments and procurement, as well as during bidding and tender procedures. It also identified critical barriers to implementing blockchain technologies in Sri Lankan construction projects, containing financial resource constraints, lack of customer awareness, and insufficient stakeholder involvement. Advantages of blockchain technology were identified as fraud resistance, the ability to detect and correct misrepresentations or mistakes, improved information reliability, enhanced response times, and disintermediation.

Keywords: Blockchain; economic crisis; construction industry; Sri Lanka

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LIST OF ABBREVIATIONS

Abbreviation	Description
BIM	Building information modeling
COVID-19	CORONAVIRUS Disease of 2019
DTL	Distributed Ledger Technology
GIS	Geographic Information Systems
IoT	Internet of Things
IT	Information Technology
QR	Quick-Response
RFID	Radio-Frequency Identification
RII	Relative Importance Index
USD	United States Dollars

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