STUDY ON BLOCKCHAIN TECHNOLOGY ADOPTION IN THE SHIPPING INDUSTRY IN SRI LANKA

Silwath Pathirannehelage Pubudu Tiyasha Pathirana

208457X

MBA in Supply Chain Management

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Thesis submitted in partial fulfillment of the requirements for the degree

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DECLARATION OF THE CANDIDATE & SUPERVISOR

I declare that this is my work and this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another personexcept where the acknowledgment is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Tiyasha Date: 13/01/2024

The above candidate has carried out research for the Master's thesis/dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

Name of Supervisor: Dr. T. Sivakumar

Signature of the Supervisor: Date: 13th Jan 2024

DEDICATION

I dedicate this MBA research to the relentless pursuit of excellence, and to those who believe in the power of education and continuous learning. This research is dedicated to aspiring leaders, innovators, and change-makers who seek to make a positive impact in the business world.

I dedicate this research to my fellow MBA students, who have challenged and inspired me throughout this journey. Our collective collaboration and diverse perspectives have enriched the learning experience, fostering an environment of growth and camaraderie.

To my family and friends, thank you for your unwavering support and understanding during this demanding endeavor. Your encouragement and belief in my abilities have fueled my determination to succeed.

May this research contribute to the body of knowledge in business administration and catalyze positive change in the corporate world.

ACKNOWLEDGMENT

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I would also like to thank the faculty members and staff at the University of Moratuwa for providing a conducive learning environment and access to resources that were essential for conducting this research.

Furthermore, I am indebted to the participants who willingly shared their time and knowledge, enabling the collection of valuable data for analysis.

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ABSTRACT

This exploratory survey's goal is to identify the major factors that may influence and hinder the adoption of blockchain technology applications in Sri Lanka's maritime shipping sector. Ocean transportation still conducts daily business by exchanging files of physical documents. This, therefore, affects the effectiveness of corporate processes by raising administrative expenses while increasing lead times. Possible solutions based on blockchain technology are being created to address these problems and enable the safe digital interchange of business documents and automatic assembling through smart contracts.

The utilization of the research onion facilitated the identification of the research methodology and positivism research philosophy, deductive approach, mono method using quantitative data, survey strategy, and cross-sectional time horizon were the six layers respectively. The data collection method chosen was a structured questionnaire, specifically a close-ended questionnaire. This questionnaire was designed by the UTAUT model and distributed among various entities in the shipping industries.

The data analysis techniques selected for this study were correlation and regression analysis. These techniques were employed to determine the significant influences of individual variables on the behavior intention and actual usage of blockchain technology.

This study investigates the determinants of Behavior Intention (BI) and Actual Usage (AU) in the adoption of blockchain technology within organizations. Model 1 reveals a robust explanatory capacity (R-squared = 74.4%), emphasizing Perceived Usefulness and Subjective Norms as primary influencers. Model 2 underscores the pivotal role of BI in driving AU (R-squared = 87.4%), with a substantial positive impact (BI coefficient = 0.935). Model 3 highlights Facility Conditions' significant influence on AU (R-squared = 34.9%, FC coefficient = 0.591). Overall, these findings underscore the multifaceted impact of predictors, providing valuable insights for organizations navigating blockchain adoption.

The empirical examination unequivocally establishes the substantive influence of several pivotal factors on the behavioral intention and actual usage pertaining to the individual's inclination towards the adoption of blockchain technology. Specifically, perceived usefulness, perceived ease of use, stockholder trust, perceived personal benefit, perceived risk, attitude towards digitalization, facility condition, and subjective norms emerge as salient determinants, collectively shaping the trajectory of behavioral intention and the tangible utilization of blockchain technology. This discernment extends beyond mere statistical significance, illuminating the intricate interplay of these factors in influencing the nuanced decision-making processes surrounding the adoption of blockchain technology. The comprehensive analysis underscores the multidimensional nature of the considerations impacting individuals' readiness to embrace blockchain, explaining a sophisticated understanding of the intricate dynamics that govern the adoption landscape.

The accuracy of addressing the research problem in this study is limited by factors such as the sample size, analysis techniques, data collection techniques, quantitative method, and the validity of questionnaire responses.

Keywords: Blockchain technology, UTAUT model, Behavior intention, Actual usage

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Description
BT	Blockchain Technology
Pow	Proof of Work
RPoW	Reusable Proof of Work
DApp	Decentralized applications
TPS	Transaction per second
BOL	Bill of Lading
ERP	Enterprise resource plan
SOLAS-VGM	Safety of Lives at Sea - Verified Gross Mass
TRA	Theory of Reasoned Action
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
MPCU	Model of PC Utilization
MM	Motivational Model
SCT	Social Cognitive Theory
TAM2	Extension of the Technology Acceptance Model
IDT	Innovation Diffusion Theory
UTAUT	Unified Theory of Acceptance and Usage of Technology
PE	Personal Expectancy
EE	Effort Expectancy
SI	Social Influence
BI	Behavior Intention
FC	Facility condition
PU	Perceived Usefulness
STR	Stakeholder trust
SN	Subjective norms

AU	Actual usage
PB	Personal benefits
AD	Attitude toward digitalization

LIST OF APPENDICES