OPERATION OF FREIGHT FORWARDERS AND ADOPTION OF RAIL INTER-TERMINAL TRANSFER SYSTEM FOR CONTAINERISED CARGO MOVEMENT OF TANJUNG PELEPAS PORT, MALAYSIA

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ASIA e UNIVERSITY

2024

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HALIL BIN ALI

A Thesis Submitted to Asia e University in
Fulfilment of the Requirements for the
Doctor of Business Administration

April 2024

ABSTRACT

This dissertation explores the application of the Technology Acceptance Model (TAM) in the context of rail interterminal transportation. Utilizing the TAM framework, the study tests various hypotheses and research questions through extensive statistical analysis. Data was collected via surveys conducted among freight forwarding companies and analysed using SPSS software. The results demonstrate that the original TAM model, along with its subsequent iterations, effectively predicts and explains user acceptance of technology within rail interterminal transfer operations. The analysis identified perceived usefulness and perceived ease of use as the primary dimensions influencing technology adoption. Additionally, secondary dimensions such as privacy, perceived security, perceived trustworthiness, and perceived capability also significantly impact user acceptance. Correlation analysis showed that all null hypotheses were accepted except 1, indicating relationships among the variables as posited by the model. However, regression analysis revealed the presence of additional factors that may influence the outcomes, suggesting the complexity of technology adoption in this context. Based on these findings, several recommendations are proposed. These recommendations address the results derived from the demographic analysis, correlation analysis, and regression analysis, offering actionable insights for improving technology acceptance in rail interterminal transfer operations.

Keywords: Container interterminal transfer, technology acceptance model, integrated freight transportation, container terminal operation, role of freight forwarders in contanerization

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the Doctor of Business Administration.

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DECLARATION

I hereby declare that the thesis submitted in fulfilment of the DBA is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

Name: Halil bin Ali

Signature of Candidate: **Date**: 26 April 2024

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ACKNOWLEDGEMENTS

The journey that I and my fellow aspirants going through this project had never been easy. Having to go through daily workloads and working on this project has its cost. But the journey has given me strength and confidence, knowledge, and wisdom to deal with my professional activities.

This project is not about one-man show. Professor Juhary Ali has been a bulwark at times when giving up was an option. His advice and a hand on my shoulder kept me on the path, no matter how hard it was. My gratitude should also be given to all my lecturers, particularly Professor Bahaudin for being around when I needed him.

I must thank my advisor, Dr. Muhammad Zaly Shah from UTM and Prof Juhary Ali for their detailed guidance and the picture of clear path forward. Their professionalism is very high, bar none.

In real life, true friends are sometimes a walking stick and a ray of light for walking the ever-winding route. Especially in this case, they too are DBA aspirants. We nudged; we helped each other until we see the finishing line.

To my wife, Fairuz Ramli, my daughter and my son, their tolerance, support and soothing words gave me the energy to push forward. They are my very reasons to take this path to the very end.

Last but not least, this journey is taken with all the unshaken believe that Allah SWT is there to shower me with His blessing, love and compassionate without which, survival in this venture would have surely faltered.

All these had told me not once, if I need to go through these one more time, I believe I can.

TABLE OF CONTENTS

ABSTRACT ii
APPROVAL iii
DECLARATION iv
ACKNOWLEDGEMENTS vi
TABLE OF CONTENTS viii
LIST OF TABLES xii
LIST OF FIGURES xvi
LIST OF ABBREVIATION xviii

CHAPTER 1 INTRODUCTION 1

1.0 Background of the Study 1
1.1 Problem Statement 17
1.2 Research Questions and Objectives 19
1.2.1 Research Questions 19
1.2.2 Research Objectives 21
1.3 Significance of Studies 22
1.4 Scope of Study and Limitation 23
1.5 Assumption 25
1.6 Conclusion 26

CHAPTER 2 LITERATURE REVIEW 27

2.0 Introduction 27
2.1 Business Strategy in a Globalized Trade 27
2.2 Supply Chain 29
2.3 Port Operations and Shipping 30
2.4 Containerization 33
2.5 Container Terminal and Distribution Models 33
2.6 Inter Terminal Transfer (ITT) 35
2.6.1 Interterminal Transfer Stages 38
2.6.2 Road Haulage 40
2.6.3 Rail Movement 40
2.6.4 Water Way 45
2.6.5 Intramodality in Interterminal Transfer Operation 45
2.7 Marketing 47
2.8 Customer Relations Management 53
2.9 Linking Marketing Strategy, Customer Relations and Ritt Adoption 58
2.10 Diffusion of Innovations Theory 59
2.11 Innovations Resistance Theory 61
2.12 Social Cognitive Theory 62
2.13 Technology-Organization-Environment (TOE) Framework 64
2.14 Technology Acceptance as Theoretical Framework 68
2.14.1 TAM and Transportation 76
2.14.2 TAM and Technology Innovation 77
2.14.3 TAM and Marketing Strategy 79
2.14.4 Extending TAM with Privacy, Security, Capability and Trust 79

2.14.5 Extending TAM with Customer Relationships and Buyer Decisions Grid 87
2.14.6 Model for Framework 92
2.14.7 Application of TAM 93
2.14.8 Research Paradigm and Research Framework 95
2.14.9 Research Gaps 99
2.15 Conclusion 100

CHAPTER 3 METHODOLOGY 102

3.0 Introduction 102
3.1 Understanding Phenomenon 105
3.2 Research Hypotheses 106
3.3 Link between Questions and Hypotheses 111
3.4 Research Paradigm 113
3.5 Quantitative Research Methodology 114
3.6 Population and Sampling 115
3.6.1 Statistical Justification 121
3.6.2 Conclusion 124
3.7 Unit of Observation 124
3.8 Instrumentation 125
3.9 Pilot Testing 130
3.9.1 Respondents for Pilot Testing 131
3.9.2 Justification 131
3.9.3 Objective of the Test 133
3.9.4 Result of Pilot Testing 134
3.9.5 Pilot Testing Summary 140
3.10 Data Analysis 141
3.10.1 Reliability Analysis 141
3.10.2 Demographic Analysis 144
3.10.3 Correlation Analysis 144
3.10.4 Regression Analysis 147
3.10.5 Descriptive Statistics 149
3.10.6 Chi-Square Tests 149
3.11 Implication and Conclusion 150
3.11.1 Implications 151
3.11.2 Conclusion 152
3.12 Chapter Summary 153

CHAPTER 4 DATA ANALYSIS AND FINDINGS 155

4.0 Introduction 155
4.1 Overview of Data Collected 155
4.1.1 Response Rate 156
4.1.2 Reliability Statistics 156
4.2 Demographic Analysis 160
4.2.1 By Job Position 161
4.2.2 By Marketing Responsibility 164
4.2.3 By Involvement in Ports 169
4.2.4 Volume Handled by TEUs 172
4.2.5 By Number of Years in Related Business 176
4.2.6 By Number of Employees 179

4.2.7 Summary of Demographic Analysis 183
4.3 Correlation Analysis 187
4.3.1 Correlation between Independent Variables and Dependent Variables 188
4.3.2 Conclusion to Correlation Analysis 233
4.4 Regression Analysis 236
4.4.1 Regression Analysis for IV (Perceived Usefulness) Against the DV (Usage of RITT) 236
4.4.2 Regression Analysis for IV (Ease of use) Against the DV (Usage of RITT) 237
4.4.3 Regression Analysis for IV (Security) Against the DV (Usage of RITT) 238
4.4.4 Regression Analysis for IV (Capabilities) Against the DV (Usage of RITT) 239
4.4.5 Regression Analysis for IV (Trustworthiness) Against the DV (Usage of RITT) 240
4.4.6 Regression Analysis for IV (Privacy) Against the DV (Usage of RITT) 241
4.4.7 Conclusion on Regression Analysis 242
4.5 Re-statement of Hypotheses 244
4.5.1 Acceptance or Rejection of Hypothesis 244
4.5.2 Reasons for Accepting or Rejecting the Hypothesis 245
4.6 Conclusion of Data Analysis and Findings 253
4.6.1 Demographic Analysis 253
4.6.2 Correlation Analysis 254
4.6.3 Regression Analysis 254
4.6.4 Finding Conclusion 255

CHAPTER 5 CONCLUSION, IMPLICATION AND RECOMMENDATIONS 256

5.0 Introduction 256
5.1 TAM and Rail Interterminal Transfer 259
5.2 Research Contribution 267
5.3 Methodological Contribution 269
5.4 Managerial Contributions 270
5.5 Limitations and Future Research Directions 272
5.5.1 Structural Equation Modelling (SEM) 273
5.5.2 Cluster Analysis 274
5.5.3 Factor Analysis 274
5.5.4 Moderation and Mediation Analysis 274
5.6 Conclusions 274
5.7 Recommendations 276
5.7.1 Recommendation Based on the Demographic Finding's Conclusion 277
5.7.2 Recommendation Based on Correlation Findings Conclusion 277
5.7.3 Recommendation Based on Regression Findings Conclusion 278
5.7.4 Recommendations Based on the Hypothesis Acceptance 279

REFERENCES **288**
APPENDICES **310**
Appendix A- Predictors in Independent and Dependent Variables 310
Appendix B- Pilot Testing 314
Appendix C- Questionnaire 319
Appendix D- Collinearity Test for Variables Descriptors 329
Appendix E- List of Research on TAM 332
Appendix F- Table of Glossary 336

LIST OF TABLES

Table		Page
1.1	Cargo handling at Johor Port 1991-2016	8
1.2	Cargo handling at 1999 - 2016 (LPJ)	12
1.3	Hinterlands connectivity between Johor Port and PTP	17
2.1	Review of CRM research (2016 - 2019)	57
3.1	Variables and corresponding examples of research questions and hypothesis	112
3.2	Sample calculation	121
3.3	Application of Phyton for power analysis calculations	122
3.4	Designs of questionnaire	127
3.5	Respondents for pilot testing	131
3.6	Reliability test on perceived usefulness	134
3.7	Reliability test on ease of use	135
3.8	Reliability test on capabilities	136
3.9	Reliability test on security	137
3.10	Reliability test on privacy	138
3.11	Reliability test on thrust	139
3.12	Values of Cronbach's Alpha	142
4.1	Reliability statistics (Perceived usefulness)	157
4.2	Reliability statistics (Ease of use)	157
4.3	Cronbach Alpha for privacy	158
4.4	Reliability test for item to item (Security)	158
4.5	Reliability test for item to item (Capability)	158
4.6	Cronbach Alpha for trustworthiness	159

4.7	Range of VIF value in the test of multicollinearity	160
4.8	Respondents by job position	161
4.9	Chi-square tests on job positions and RITT usage	162
4.10	Position and marketing responsibility	165
4.11	Descriptive statistics on position and marketing responsibility	165
4.12	Chi-square tests on position with marketing responsibility and usage of RITT	166
4.13	Port involvement	169
4.14	Descriptive statistics on comparison between port involvement and RITT adoption	170
4.15	Chi-square tests on overall port involvement and RITT adoption	170
4.16	Volume handled by TEUs	172
4.17	Volume handled by TEUS	173
4.18	Relationship between volume handled in TEUS and RITT adoption overall	173
4.19	Respondents by years in business	176
4.20	Descriptive statistics on RITT adoption and years in business	177
4.21	Relationship between RITT adoption and years in business	177
4.22	Respondents by number of employees	180
4.23	Number of employees of organizations and their adoption of RITT	181
4.24	Correlation between IV (Usefulness) and DV (Had experienced to use RITT)	188
4.25	Correlation between IV (Ease of use) and DV (Experience with RITT)	191
4.26	Correlation between IV (Capabilities) and DV (Experience with RITT)	194
4.27	Correlation between IV (Security) and DV (Experience with RITT)	196

4.28	Correlation between IV (Privacy) and DV (Experience with RITT)	198
4.29	Correlation between IV (Trust) and DV (Experience with RITT)	200
4.30	Correlation between IV (Trust) and DV (Experience with RITT)	203
4.31	Correlation between IV (Trust) and DV (Experience with RITT)	206
4.32	Correlation between IV (Capabilities) and DV (RITT quantity per shipment)	208
4.33	Correlation between IV (Capabilities) and DV (RITT quantity per shipment)	210
4.34	Correlation between IV (Privacy) and DV (RITT quantity per shipment)	213
4.35	Correlation between IV (Trust) and DV (RITT quantity per shipment)	215
4.36	Correlation between IV (Trust) and DV (RITT quantity per shipment)	218
4.37	Correlation between IV (Ease of use) and DV (Importance of RITT as a strategy)	221
4.38	Correlation between IV (Security) and DV (Importance of RITT as a strategy)	224
4.39	Correlation between IV (Capabilities) and DV (Importance of RITT as a strategy)	226
4.40	Correlation between IV (Privacy) and DV (Importance of RITT as a strategy)	229
4.41	Correlation between IV (Trust) and DV (Importance of RITT as a strategy)	231
4.42	Summary of correlation analysis	233
4.43	Regression analysis for IV (Perceived usefulness) against the DV (Usage of RITT)	237

4.44 Regression analysis for IV (Ease of use) against the DV (Usage of RITT) 238
4.45 Regression analysis for IV (Security) against the DV (Usage of RITT) 239
4.46 Regression analysis for IV (Capabilities) against the DV (Usage of RITT) 240
4.47 Regression analysis for IV (Trustworthiness) against the DV (Usage of RITT) 241
4.48 Regression analysis for IV (Privacy) against the DV (Usage of RITT) 242
4.49 Hypothesis acceptability 244

LIST OF FIGURES

Figure		Page
1.1	Johor Port and surrounding competition	7
1.2	Transhipment container traffic in Johor Port (LPJ 2024)	9
1.3	PTP container traffic 2006 – 2024 (LPJ)	13
2.1	Schematic representation of a container terminal	46
2.2	The IDIC methodology	50
2.3	The marketing continuum	50
2.4	Transaction marketing and strategic relationships	52
2.5	The evolution towards relationship marketing	53
2.6	The ACSI model	54
2.7	A framework for customer loyalty	55
2.8	Technology organization environment framework	64
2.9	Original technology acceptance model	69
2.10	Theory of reasoned action	69
2.11	Technological acceptance model	71
2.12	Modified TAM	72
2.13	Final version of TAM	73
2.14	Unified theory of acceptance and user of technology model	73
2.15	TAM2	74
2.16	Unified Theory of Acceptance and Use of Technology-2 purpose and importance of this research	75
2.17	Buying decision grid	90
2.18	Chronological graph for the evolution of technology acceptance theories	93

2.19	Research framework	97
3.1	JOFFA membership	119
3.2	Pearson correlation coefficient	145
3.3	The spectrum of the correlation coefficient (-1 to +1)	145
3.4	R-squared model	147
4.1	Respondents by job position	161
4.2	Positions with marketing responsibilities	165
4.3	Port involvement	169
4.4	Years in business	176
4.5	Number of employees in respondents' organization	180

LIST OF ABBREVIATION

CRM	Customer Relations Management
EV	Electric Vehicle
FF	Freight Forwarder
DV	Dependent Variable
IS	Information System
IT	Information Technology
ITT	Interterminal transfer
IV	Independent Variable
JP	Johor Port
JPA	Johor Port Authority
JOFFA	Johor Freight Forwarder Association
JPCT	Johor Port Container Terminal
LME	London Metal Exchange
LPJ	Lembaga Pelabuhan Johor
MIS	Management Information System
MT	Metric tonne
PSA	Port of Singapore Authority
PTP	Port of Tanjung Pelepas
RITT	Rail interterminal Transfer

SM	Supply Chain Management
SMI	Small and Medium Industry
TAM	Technology Acceptance Model
TEU	Twenty-foot Equivalent Unit

CHAPTER 1

INTRODUCTION

1.0 Background of the Study

As a maritime nation, Malaysia is surrounded by the sea on both sides. With industrialization in both Peninsular Malaysia and East Malaysia, the sea facilitates global trade of the country. Malaysia has a long history of providing port services, dating back to the Malacca Empire. However, its full maritime potential has yet to be fully exploited.

The Strait of Malacca is a major sea lane for shipping, connecting the western and eastern hemispheres. It links major economies such as China and Japan, fast-developing economies like Vietnam, Indonesia, and the Philippines in the east, and India, the Middle East, and Europe in the west. Hundreds of thousands of ships traverse these waters annually, with a fraction calling at Malaysian ports to load or discharge cargo contributing hugely to the country's GDP through external trade.

The country's significant contribution to international trade is further underscored by its proximity to vital shipping lanes, particularly the Straits of Malacca and the South China Sea. These waterways are among the busiest and most important maritime routes in the world, serving as conduits for a substantial portion of global trade. The Straits of Malacca, for instance, is a key chokepoint that sees the transit of about 25% of the world's traded goods, making Malaysia's role in ensuring the security and smooth operation of this passage critical (Zubir, 2007).

Malaysia is deeply intertwined with its maritime activities, which are crucial to its security, economy, and national sovereignty (Suhaimi, et.al, 2023). The country relies heavily on sectors such as fishing, the oil and gas industry, ports and shipping,

and tourism. With an extensive coastline stretching over 4,600 kilometres, Malaysia is acutely aware of the importance of maritime security. This strategic geographical positioning necessitates robust measures to safeguard its waters, prompting Malaysia to play a pivotal role in the International Maritime Organization (IMO).

Malaysia's ports play a significant role in the nation's trade performance (Mohamad Rosni, 2011). The country has categorized its ports into major and minor ports, based on their capacity and strategic importance. Most of these ports operate as multiterminal ports, meaning they can handle various types of cargo including bulk, break bulk, and containerized goods. Notably, at least one of Malaysia's ports is designated as a container transshipment port, specializing in the transfer of containerized cargo between ships, facilitating global trade routes and improving logistics efficiency (Zailani and Jeevan, 2019). This strategic organization and specialization of ports enhance Malaysia's ability to manage and boost its trade activities effectively.

Furthermore, Malaysia's ports are some of the most active in the region, with Port Klang and the Port of Tanjung Pelepas ranking among the world's top container ports. These hubs facilitate a high volume of cargo movement, reinforcing Malaysia's status as a central player in international logistics and trade.

As a major trading nation, Malaysia is increasingly becoming a central hub in the global supply chain (https://www.mida.gov.my). This transformation is driven by its relatively good and well-developed infrastructure and strategic initiatives. The country provides commodity handling capacities, enabling efficient management of diverse goods ranging from raw materials to finished products (Ismail et al., 2019). Its container terminals, such as those at Port Klang and the Port of Tanjung Pelepas,

facilitate the seamless movement of a huge volume of cargo, ensuring timely and cost-effective shipping operations particularly for transhipment containers.

Malaysia's free trade zones (https://www.mida.gov.my) provide significant incentives for businesses, including tax benefits and streamlined customs procedures, attracting multinational companies to establish operations within the country. These zones, coupled with sophisticated distribution centres, enhance the efficiency of logistics and warehousing, ensuring that goods can be quickly processed and dispatched to their final destinations.

The role of Malaysia's free trade zones can be further enhanced by leveraging the interconnectedness of its ports, facilitated by a robust freight transportation infrastructure. These free trade zones serve as pivotal hubs for international trade, offering favourable conditions for businesses to operate, including streamlined customs procedures, tax incentives, and access to state-of-the-art logistics facilities.

By strategically linking these free trade zones with an efficient and well-connected network of ports, Malaysia can unlock even greater economic potential. Imagine a seamless flow of goods and commodities moving effortlessly from the manufacturing centres within the free trade zones to the ports for export to global markets. This interconnectedness not only enhances the efficiency of trade operations but also strengthens Malaysia's position as a competitive player in the global supply chain.

Investments in transportation infrastructure, such as highways, railways, and intermodal terminals, are crucial for facilitating this seamless movement of goods. A well-developed infrastructure network ensures that products can be transported quickly and cost-effectively from production centres to ports, reducing transit times and logistics costs for businesses (Zen et al., 2019).

Furthermore, the integration of advanced technologies, such as real-time tracking systems and automated cargo handling equipment, enhances the efficiency and reliability of freight transportation within Malaysia's interconnected port network. This not only attracts more businesses to utilize the free trade zones but also improves the overall competitiveness of Malaysian exports in the global market.

Moreover, the interconnectedness of Malaysia's ports opens up new opportunities for collaboration and synergies between different industries and sectors. For example, manufacturers located within the free trade zones can benefit from just-in-time inventory management practices enabled by efficient port operations. Similarly, exporters can capitalize on the availability of diverse shipping routes and services to reach a wider range of international markets.

In essence, the interconnectedness of Malaysia's ports facilitated by a well-developed freight transportation infrastructure amplifies the effectiveness of its free trade zones, driving economic growth, fostering innovation, and strengthening Malaysia's position as a dynamic trading nation in the global arena.

Moreover, Malaysia's status as a financial hub particularly in Islamic finance plays a crucial role in supporting global trade. Its developed Islamic banking and financial services sector provide essential support for international transactions, trade financing, and investment, bolstering the overall efficiency and reliability of the global supply chain.

The effectiveness and efficiency of Malaysia's financial system in allocating financial resources will be vital for the country's transformation into a high value-added, high-income economy. As regional economic and financial integration deepens, the financial sector will play an increasingly significant role in intermediating