



**ENTERPRISE RISK MANAGEMENT MODEL  
TOWARDS HOSPITAL PERFORMANCE THROUGH  
MEDIATING ROLE OF BUSINESS MODEL  
INNOVATION**

اونيورسيتي تيكنيكل مليسيا ملاك  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**FATIMA MOHAMED HUSSAIN RAHMATALLA  
ALMAAZMI**

**DOCTOR OF PHILOSOPHY**

**2025**



**Institute of Technology Management and Entrepreneurship**

**ENTERPRISE RISK MANAGEMENT MODEL TOWARDS HOSPITAL  
PERFORMANCE THROUGH MEDIATING ROLE OF BUSINESS  
MODEL INNOVATION**

اونيورسيتي تيكنيكل مليسيا ملاك  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**Fatima Mohamed Hussain Rahmatalla Almaazmi**

**Doctor of Philosophy**

**2025**

**ENTERPRISE RISK MANAGEMENT MODEL TOWARDS HOSPITAL  
PERFORMANCE THROUGH MEDIATING ROLE OF BUSINESS MODEL  
INNOVATION**

**FATIMA MOHAMED HUSSAIN RAHMATALLA ALMAAZMI**



**A thesis submitted**

**in fulfillment of the requirements for the degree of Doctor of Philosophy**



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

**Institute of Technology Management and Entrepreneurship**

**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**2025**

## DECLARATION

I declare that this thesis entitled “enterprise risk management model towards hospital performance through mediating role of business model innovation” is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



Signature

:

.....

Name

:

FATIMA MOHAMED HUSSAIN RAHMATALLA ALMAAZMI

Date

:

6/3/2025

## APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Doctor of Philosophy.

Signature :

Supervisor Name :

Date :

DR. RUZAIDI BIN ZAMRI

06/03/2025

اونيورسيتي تېكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

## DEDICATION

I would like to dedicate this thesis to my beloved family and my parents, who have been the source of inspiration and gave me strength. There is no doubt that without their continual support, moral, spiritual, and financial support I would not have completed this piece of work.





## ABSTRACT

The healthcare sector in the UAE operates within a complex regulatory environment that necessitates effective Enterprise Risk Management (ERM) strategies to ensure financial sustainability, operational efficiency, and enhanced patient care. Despite the growing emphasis on risk management, limited research has explored its indirect effects on hospital performance through Business Model Innovation (BMI) and the moderating influence of stakeholder engagement. This study addresses this gap by examining the relationship between ERM and hospital performance, investigating BMI as a mediating factor, and assessing the role of stakeholder engagement in strengthening this relationship. Grounded in the Resource-Based View (RBV) and Agency Theory, this research positions ERM as a strategic capability that enhances hospital resilience while addressing information asymmetries between administrators and stakeholders. A quantitative research design was employed, utilizing survey responses from 227 hospital managers across private, general, and specialist hospitals in the UAE. The findings confirm that ERM significantly enhances hospital performance, particularly in financial and operational aspects, but does not directly drive business model innovation. Instead, BMI fully mediates the ERM-performance link, highlighting the importance of strategic innovation in maximizing ERM benefits. Additionally, stakeholder engagement positively moderates the ERM-BMI relationship, emphasizing the role of collaborative governance in fostering innovation. These insights contribute to the theoretical discourse by extending RBV and Agency Theory to the healthcare sector, demonstrating how risk management capabilities, innovation, and stakeholder participation collectively enhance hospital outcomes. From a practical standpoint, the study underscores the need for UAE hospitals to integrate ERM with innovation strategies and stakeholder collaboration to navigate regulatory challenges and optimize healthcare delivery. Policymakers should foster environments that encourage risk-informed innovation while ensuring compliance with national healthcare objectives. However, the study's reliance on cross-sectional survey data and self-reported managerial perspectives presents limitations, warranting future longitudinal research to assess the evolving impact of ERM on hospital performance. Future research should also explore multi-stakeholder perspectives, digital transformation in risk management, and the varying influence of different stakeholders in ERM implementation. By advancing both theoretical and practical insights, this study offers a comprehensive framework for enhancing hospital resilience and sustainability in the UAE's dynamic healthcare landscape.



# **MODEL PENGURUSAN RISIKO ENTERPRISE KE ARAH PRESTASI HOSPITAL MELALUI PERANAN PERANTARA INOVASI MODEL PERNIAGAAN**

## **ABSTRAK**

Sektor penjagaan kesihatan di UAE beroperasi dalam persekitaran peraturan yang kompleks, memerlukan strategi Pengurusan Risiko Perusahaan (ERM) yang berkesan untuk memastikan kelestarian kewangan, kecekapan operasi, dan penjagaan pesakit yang lebih baik. Walaupun penekanan terhadap pengurusan risiko semakin meningkat, penyelidikan yang terhad telah meneroka kesan tidak langsungnya terhadap prestasi hospital melalui Inovasi Model Perniagaan (BMI) dan pengaruh moderasi penglibatan pihak berkepentingan. Kajian ini menangani jurang tersebut dengan mengkaji hubungan antara ERM dan prestasi hospital, menyiasat BMI sebagai faktor perantara, dan menilai peranan penglibatan pihak berkepentingan dalam mengukuhkan hubungan ini. Berlandaskan pada Pandangan Berasaskan Sumber (RBV) dan Teori Ejen, penyelidikan ini meletakkan ERM sebagai keupayaan strategik yang meningkatkan daya tahan hospital sambil menangani asimetri maklumat antara pentadbir dan pihak berkepentingan. Reka bentuk penyelidikan kuantitatif digunakan, dengan menggunakan tinjauan daripada 227 pengurus hospital di hospital swasta, hospital umum, dan pusat pakar di UAE. Dapatan kajian mengesahkan bahawa ERM meningkatkan prestasi hospital secara signifikan, terutamanya dalam aspek kewangan dan operasi, tetapi tidak secara langsung mendorong inovasi model perniagaan. Sebaliknya, BMI sepenuhnya menjadi perantara dalam hubungan ERM-prestasi, menekankan kepentingan inovasi strategik dalam memaksimumkan manfaat ERM. Selain itu, penglibatan pihak berkepentingan secara positif memoderasi hubungan ERM-BMI, menonjolkan peranan tadbir urus kolaboratif dalam mendorong inovasi. Penemuan ini menyumbang kepada perbincangan teori dengan memperluaskan RBV dan Teori Ejen ke dalam sektor penjagaan kesihatan, menunjukkan bagaimana keupayaan pengurusan risiko, inovasi, dan penyertaan pihak berkepentingan secara kolektif meningkatkan hasil hospital. Dari perspektif praktikal, kajian ini menekankan keperluan bagi hospital di UAE untuk mengintegrasikan ERM dengan strategi inovasi dan kolaborasi pihak berkepentingan bagi menangani cabaran peraturan dan mengoptimumkan penyampaian penjagaan kesihatan. Penggubal dasar harus mewujudkan persekitaran yang menggalakkan inovasi berasaskan risiko sambil memastikan pematuhan dengan objektif penjagaan kesihatan negara. Walau bagaimanapun, kebergantungan kajian terhadap data tinjauan rentas keratan dan perspektif pengurus hospital yang dilaporkan sendiri membentangkan beberapa keterbatasan, justeru penyelidikan masa depan perlu dijalankan secara longitudinal bagi menilai kesan ERM terhadap prestasi hospital dalam jangka panjang. Penyelidikan akan datang juga harus meneroka perspektif pelbagai pihak berkepentingan, transformasi digital dalam pengurusan risiko, dan pengaruh pelbagai jenis pihak berkepentingan terhadap pelaksanaan ERM. Dengan memajukan kedua-dua perspektif teori dan praktikal, kajian ini menawarkan rangka kerja komprehensif untuk meningkatkan daya tahan dan kelestarian hospital dalam landskap penjagaan kesihatan UAE yang dinamik.

## ACKNOWLEDGEMENTS

I would like to express the deepest appreciation to my supervisor, Dr. Ruzaidi Bin Zamri, who guide me and persistent help in completing my thesis. His support and words of encouragement give a positive attitude to me in completing my thesis which I am grateful for.

I would also like to thank my second supervisor, Dr. Nik Mohd Farid Bin Che Zainal Abidin for his full support and guidance at the beginning of my research work.

I am extremely grateful to my husband, my children, and my parents for their love, prayers, unlimited patience, and for preparing me for my future in completing this research work.



## TABLE OF CONTENTS

<b>ABSTRACT .....</b>	<b>ii</b>
<b>ABSTRAK.....</b>	<b>ii</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>2</b>
<b>TABLE OF CONTENTS .....</b>	<b>3</b>
 <b>LIST OF TABLES.....</b>	 <b>6</b>
 <b>LIST OF FIGURES.....</b>	 <b>9</b>
 <b>LIST OF APPENDICES .....</b>	 <b>10</b>
 <b>LIST OF ABBREVIATIONS .....</b>	 <b>11</b>
 <b>LIST OF PUBLICATIONS.....</b>	 <b>12</b>
1.1 Introduction .....	14
1.2 Background of the study .....	14
1.3 Risk in Hospitals .....	16
1.4 Healthcare in the UAE .....	18
1.5 Problem statement.....	21
1.6 Research questions .....	23
1.7 Research objectives .....	24
1.8 The scope of the study .....	24
1.9 The significance of the study .....	25
1.10 Operational definition.....	26
1.11 Thesis structure.....	28
 <b>CHAPTER 2.....</b>	 <b>30</b>
2.1 Introduction .....	30
2.2 Hospital Performance.....	30
2.2 Enterprise Risk Management in Healthcare.....	37
2.3 Enterprise Risk Management.....	40
2.4 Business Model Innovation .....	45
2.5 Stakeholder Engagement .....	47
2.5 Theoretical framework .....	49
2.5.1 Resource Based View.....	49
2.5.2 Agent Theory.....	50
2.5.3 Justification of using Agent Theory .....	53
2.6 Hypotheses Development .....	54
2.6.1 Enterprise Risk Management and Hospital Performance.....	54
2.6.2 Enterprise Risk Management and Business Model Innovation .....	55
2.6.3 Business Model Innovation and Performance .....	57

2.6.4 Stakeholders' Moderating Role Between ERM and Business Model Innovation .....	58
2.7 Theoretical Framework .....	60
<b>CHAPTER 3.....</b>	<b>65</b>
3.1 Introduction .....	65
3.2 Research Design .....	65
3.3 Research Process .....	75
3.4 Operationalization of questionnaire construct .....	77
3.5 Validity and reliability .....	84
3.5.1 Validity .....	85
3.1.1 Reliability .....	88
3.6 Population and sample size.....	90
3.6.1 Sampling technique .....	92
3.6.2 Sample size determination .....	93
3.7 Analysis of Data.....	97
3.8 Summary .....	101
4.1 Introduction.....	103
4.2 Data Screening .....	103
4.3 Demographic Analysis.....	106
4.4 Descriptive Statistics Results of The Variable .....	109
4.4.1 Hospital Performance.....	109
4.4.2 Enterprise Risk Management .....	111
4.4.3 Business Model Innovation.....	114
4.4.4 Stakeholders Engagement .....	117
4.5 Research model analysis .....	119
4.5.1 Assessment of measurement model.....	119
4.5.2 Composite reliability (CR) and internal consistency (IC).....	120
4.6.3 Indicator reliability .....	120
4.6.4 Convergent validity .....	124
4.6.5 Discriminant validity .....	125
4.7 Assessment of structural model.....	127
4.7.1 Multicollinearity .....	127
4.7.2 Path coefficient .....	129
4.7.3 Hypotheses testing .....	129
4.7.4 Hypothesis Testing for Moderating Relationship.....	133
4.8 Coefficient of determination ( $R^2$ ) .....	134
4.9 Summary .....	135
5.1 Introduction .....	138
5.2 Finding Discussion.....	139
5.3 Key Findings .....	140
5.3.1 Enterprise Risk Management and Hospital Performance.....	140

5.3.2 Enterprise Risk Management and Business Model Innovation .....	141
5.3.3 Business Model Innovation and Hospital Performance .....	141
5.3.4 Mediating Role of Business Model Innovation .....	142
5.3.5 Moderating Effect of Stakeholder Engagement.....	142
5.4 Implications for UAE Hospitals .....	143
5.4.1 Theoretical Contribution .....	144
5.4.2 Practical Contribution.....	146
5.5. Research Limitation and contribution .....	148
5.6 Conclusion .....	151
References.....	154
APPENDIX A.....	170
Appendix B.....	177



اونيورسيتي تيكنيكل مليسيا ملاك

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

## LIST OF TABLES

TABLE	TITLE	PAGE
2.1	The enterprise risk management towards hospital performance	20
2.2	Summary of the literature on enterprise risk management practices toward hospital performance	23
2.3	Justifying each factor of ERM practices toward HP	27
2.4	Business model innovation	31
2.5	The stakeholder's engagement in the decision making	34
2.6	The resource-based view theory component	37
2.7	The adapted ERM practices and hospital performance	40
2.8	Conceptual model indicator ERM practices and hospital performance	45
3.1	Adapted from Saunders et al. (2009), research paradigm assumptions	60
3.2	Adapted from Sekaran (2016), deductive approach	62
3.3	Phases to design and conduct a survey questionnaire	69
3.4	Functional estimate for questionnaire	71
3.5	Contrive for questionnaire	72
3.6	Elements evaluate for enterprise risk management practices and hospital performance	73
3.7	List of content validity experts	76
3.8	An outline of the study procedure	78

3.9	Cluster and population	80
3.10	Deciding sample area from a given population	82
3.11	Survey distribution and received	84
3.12	Pre-test validation	86
3.13	Determining cronbach alpha, adapted from Sekaran (2016)	87
3.14	Results of reliability analysis	87
4.1	Data collection screening	97
4.2	Descriptive statistics	98
4.3	Personal profile of respondents	100
4.4	Descriptive statistics enterprise risk management practices	102
4.5	Descriptive statistics business model innovation	103
4.6	Descriptive statistics stakeholder's engagement in the decision making	104
4.7	Descriptive statistics hospital financial performance	105
4.8	Descriptive statistics hospital non-financial performance	106
4.9	Descriptive statistics hospital environmental performance	107
4.10	Internal consistency measures	108
4.11	Indicator outer loadings (before elimination)	108
4.12	List of eliminated items	110
4.13	Indicator outer loadings (after elimination)	111
4.14	Average Variance Extracted (AVE) values	113
4.15	Fornell-Larcker criterion	114
4.16	Cross-loadings	115
4.17	VIF values	117

4.18	Path coefficients	118
4.19	Coefficient of determination	121
4.20	Direct and indirect paths ERM-BMI-Hospital financial performance	123
4.21	Direct and indirect paths ERM-BMI-Hospital non-financial performance	125
4.22	Direct and indirect paths ERM-BMI-Environmental performance	127
4.23	Significance of moderating effect of stakeholder engagement as moderator between ERM and BMI	128
5.1	Summary of research objectives, research hypothesis, and key findings	136



## LIST OF FIGURES


FIGURE	TITLE	PAGE
2.1	The resource-based view theory, Adapted from Barney (1991)	36
2.2	The conceptual model of ERM practices and hospital performance	43
3.1	Adapted from Saunders et al. (2009), research onion diagram	58
3.2	Research process	66
4.1	Structure model with t-statistics	112
4.2	Mediating effect of BMI over ERM and Hospital financial performance	123
4.3	Mediating effect of BMI over ERM and Hospital non-financial performance	125
4.4	Mediating effect of BMI over ERM and Environmental performance	127
4.5	Bootstrapping with moderator	129

## LIST OF APPENDICES

APPENDIX	TITLE	PAGE
A	Survey Questionnaire	184
B	Sample of Expert Validation 1	191



## LIST OF ABBREVIATIONS



AVE	-	Average Variance Extracted
BMI	-	Business Model Innovation
CR	-	Composite Reliability
EFA	-	Exploratory Factor Analysis
ERM	-	Enterprise Risk Management
HP	-	Hospital Performance
IC	-	Internal Consistency
IR	-	Indicator Reliability
PLS	-	Partial Least Squares
RBV	-	Resource-Based View
SD	-	Standard Deviation
SEDM	-	Stakeholder's Engagement in the Decision Making
SEM	-	Structural Equation Modelling
UAE	-	United Arab Emirates
VAF	-	Variance Accounted For
VIF	-	Variance of Inflation Factors

## LIST OF PUBLICATIONS

Mohamed, F., Rahmatalla, H., Zamri, R., and Farid, N.M., 2022. Enterprise Risk Management Practices Model for Hospital Performance in UAE. *Res Militaris*, 12(3), pp.2925–2939.

Mohamed, F., Rahmatalla, H., Zamri, R., and Farid, N.M., 2024. Assessing Relationship between Enterprise Risk Management and Hospital Performance in UAE. *Tropical Scientific Journal*, 3(2), pp.70–82.





## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

This thesis details research that explores enterprise risk management that influences the development of hospital performance in the UAE. Specifically, this research analyses the mediating impacts of business model innovation on the connection between enterprise risk management and hospital performance. It also examines the moderating effects of stakeholders' engagement in the decision-making on the connection between enterprise risk management, business model innovation, and hospital performance. The

#### **1.2 Background of the study**

Risk management as a formal part of the decision-making processes within companies is traceable to the late 1940s and early 1950s (Dickinson, 2001). ERM looks at the risk management plan from the point of view of the whole business context. It aims to assess and identify potential risks that could harm or may interfere with an organization's operation activity that led to failures. Recent studies have continued to explore the intricate relationship between Enterprise Risk Management (ERM) and organizational performance, shedding light on its direct impact and the influence of internal factors. (Monazzam and Crawford, 2024), investigated the role of ERM in fostering organizational resilience

within the Swedish mining industry. Their findings revealed that organizations implementing effective ERM practices demonstrated enhanced resilience, which translated into improved performance outcomes. This underscores the immediate and tangible benefits of ERM, particularly in industries facing high levels of operational and financial uncertainty.

Additionally, research has highlighted the significant role of internal organizational factors in shaping the relationship between ERM and performance. (Srová and Špička, 2023), examined small and medium-sized enterprises (SMEs) and found that internal elements such as organizational culture and strategic risk management performance serve as mediators in the ERM-performance linkage. Their study demonstrated that while ERM provides a structured framework for managing risks, its effectiveness heavily depends on how it integrates with an organization's internal processes and culture. These findings emphasize that ERM's value is not uniform but rather contingent on internal dynamics and strategic alignment.

These recent studies collectively highlight that ERM's impact on organizational performance is multifaceted. While it can directly enhance resilience and stability, its broader effectiveness is influenced by how well it is adapted to the organization's internal environment. This dual perspective reinforces the importance of tailoring ERM practices to fit specific organizational needs and contexts for maximizing their potential benefits.

The evolution of Enterprise Risk Management (ERM) has been significantly influenced by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In 2004, COSO introduced the "Enterprise Risk Management—Integrated Framework," providing a comprehensive approach for organizations to identify, assess, and manage risks across the enterprise. This framework emphasizes the importance of aligning risk management with an organization's objectives and strategy, promoting a holistic view of risk that transcends traditional, siloed approaches (COSO, 2023).

Subsequent studies have explored ERM's impact on organizational performance. For instance, research by (Alaeddin et al., 2021), examined the effect of ERM on organizational performance within

the diversified industries of the United Arab Emirates (UAE). Their findings suggest that effective ERM implementation positively influences performance, highlighting the importance of integrating risk management practices into organizational processes (Alaeddin et al., 2021). In the healthcare sector, ERM plays a crucial role, especially in rapidly developing regions like the UAE. The country's healthcare system has undergone significant transformations, with initiatives aimed at enhancing service quality and accessibility. Studies have indicated that adopting ERM practices in healthcare organizations contributes to improved performance by addressing risks related to patient safety, regulatory compliance, and operational efficiency (Sajwani, 2021). These insights underscore the multifaceted benefits of ERM, particularly in complex, resource-intensive sectors like healthcare. By integrating risk management into strategic frameworks, organizations can enhance resilience and performance, ensuring sustainability and adaptability in dynamic environments.

### **1.3 Risk in Hospitals**

Hospitals operate in complex environments where diverse risks significantly impact patient safety, staff well-being, operational efficiency, and financial performance. These risks necessitate the adoption of Enterprise Risk Management (ERM), which integrates risk identification, assessment, and mitigation with strategic objectives. First, effective ERM ensures high-quality care and operational resilience. Second, it supports innovation in hospital performance and business models, fostering sustainable healthcare delivery. This discussion explores recent studies to examine how risks are managed and mitigated to align with hospital performance goals and business model innovations.

To begin, Lee (2024) underscores the critical role of organizational culture in shaping risk management practices and internal control systems, which collectively enhance hospital performance. The study reveals that hospitals with robust organizational cultures are more successful in implementing effective internal controls, particularly higher-level hospitals compared to regional facilities. Furthermore, the findings emphasize that fostering ethical management practices and tailoring strategies to hospital