FACTORS INFLUENCING JORDANIAN BANKING INDUSTRY INTENTION TO ADOPT BUSINESS INTELLIGENCE TECHNOLOGY

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DECLARATION

I declare that this thesis entitled "Factors Influencing Jordanian Banking Industry Intention to Adopt Business Intelligence Technology" 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 : KHALED ABIDALLAH SALAMEH ALDARAB`AH

Date : 13 August 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: PROFESOR MADYA DR SAMER ALI AL-SHAMI

Date : 13 August 2025

DEDICATION

I wholeheartedly dedicate this work to my beloved mother and my ever-supportive father, whose endless sacrifices and unwavering love have shaped who I am today. To my dear wife, whose constant encouragement, patience, and strength provided me with the stability and motivation to pursue my dreams. To my precious children, my son Taym and my daughter Noor, whose presence brings joy and inspiration into my life, reminding me always of what truly matters. And to my brothers and sister, whose continuous support, friendship, and belief in me have greatly enriched my journey. This humble accomplishment is a tribute to the love, values, and guidance each of you has generously given me.

ABSTRACT

Business Intelligence (BI) has gained significant prominence among executives across various sectors due to its ability to support data-driven decision-making. However, its adoption within the banking sector—particularly in Jordan—remains underexplored. This study examines the key technological, organizational, and environmental factors that influence the intention to adopt BI in Jordanian commercial banks by employing an integrated framework combining the Technology Acceptance Model (TAM) and the Technology–Organization–Environment (TOE) framework. A quantitative, cross-sectional research design was adopted. Data were collected through a structured questionnaire administered to IT professionals, as well as senior and mid-level managers in Jordanian commercial banks, resulting in 382 valid responses. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS. The results demonstrated substantial explanatory power, with R^2 values of 0.496 for perceived ease of use (PEOU), 0.729 for perceived usefulness (PU), and 0.799 for intention to adopt BI. Compatibility, complexity, relative advantage, top management support, organization size, and PEOU had significant effects on PU, while organizational readiness showed no significant influence. Compatibility, complexity, and relative advantage significantly affected PEOU. Furthermore, PU, PEOU, competitive pressure, government regulation, and vendor support were significant predictors of BI adoption intention. Most relationships were positively significant except for complexity, which showed a negative effect. Mediation analysis revealed that PU and PEOU significantly mediated most relationships, except for the path from organizational readiness to BI adoption intention. This research offers both theoretical and practical contributions by being among the earliest empirical investigations in the Jordanian context to integrate the TAM and TOE frameworks in studying BI adoption. The findings provide actionable insights for banking sector decision-makers and policymakers, offering guidance on strategic planning, capacity building, and technology investment to foster successful BI implementation and enhance competitive advantage.

FAKTOR YANG MEMPENGARUHI HASRAT INDUSTRI PERBANKAN JORDAN UNTUK MENGAMALKAN TEKNOLOGI KECERDASAN PERNIAGAAN

ABSTRAK

Kepintaran Perniagaan (Business Intelligence, BI) telah mendapat perhatian yang signifikan dalam kalangan eksekutif merentasi pelbagai sektor kerana keupayaannya menyokong pembuatan keputusan berasaskan data. Namun begitu, pengaplikasiannya dalam sektor perbankan—terutamanya di Jordan—masih kurang diterokai. Kajian ini meneliti faktor teknologi, organisasi, dan persekitaran utama yang mempengaruhi niat untuk mengguna pakai BI di bank perdagangan Jordan dengan menggunakan kerangka bersepadu yang menggabungkan Model Penerimaan Teknologi (TAM) dan kerangka Teknologi–Organisasi–Persekitaran (TOE). Reka bentuk penyelidikan kuantitatif keratan rentas telah digunakan. Data dikumpulkan melalui soal selidik berstruktur yang diedarkan kepada profesional IT serta pengurus kanan dan pertengahan di bank perdagangan Jordan, menghasilkan 382 respons yang sah. Data dianalisis menggunakan Pemodelan Persamaan Berstruktur Kuasa Terkecil Separa (PLS-SEM) melalui SmartPLS. Dapatan menunjukkan kuasa penjelasan yang tinggi, dengan nilai R^2 sebanyak 0.496 bagi persepsi kemudahan penggunaan (PEOU), 0.729 bagi persepsi kegunaan (PU), dan 0.799 bagi niat mengguna pakai BI. Keserasian, kerumitan, kelebihan relatif, sokongan pengurusan atasan, saiz organisasi, dan PEOU memberi kesan signifikan terhadap PU, manakala kesediaan organisasi tidak menunjukkan pengaruh yang signifikan. Keserasian, kerumitan, dan kelebihan relatif memberi kesan signifikan terhadap PEOU. Selain itu, PU, PEOU, tekanan persaingan, peraturan kerajaan, dan sokongan vendor merupakan peramal signifikan kepada niat pengambilan BI. Kebanyakan hubungan adalah signifikan secara positif kecuali kerumitan yang menunjukkan kesan negatif. Analisis pengantaraan menunjukkan bahawa PU dan PEOU menjadi pengantara yang signifikan bagi kebanyakan hubungan, kecuali laluan daripada kesediaan organisasi kepada niat pengambilan BI. Kajian ini memberikan sumbangan teori dan praktikal dengan menjadi antara kajian empirikal terawal dalam konteks Jordan yang mengintegrasikan kerangka TAM dan TOE dalam mengkaji pengambilan BI. Dapatan kajian ini menawarkan panduan yang boleh dilaksanakan kepada pembuat keputusan sektor perbankan dan penggubal dasar, khususnya dalam perancangan strategik, pembangunan kapasiti, dan pelaburan teknologi untuk memacu kejayaan pelaksanaan BI dan meningkatkan kelebihan daya saing.

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LIST OF ABBREVIATIONS

AVE	-	Average Variance Extracted
BI	-	Business Intelligence
BIA	-	Business Intelligence and Analytics
BIS	-	Business Intelligence System
CA	-	Cronbach's Alpha
CMV	-	Common Method Variance
CR	-	Composite Reliability
CSF	-	Critical Success Factors
DW	-	Data Warehouse
ERP	-	Enterprise Resource Planning
IS	-	Information System
IT	-	Information Technology
OLAP	-	Online Analytical Processing
PEOU	-	Perceived Ease of Use
PLS-SEM	-	Partial Least Squares Structural Equation Modeling
PU	-	Perceived Usefulness
SEM	-	Structural Equation Modeling
SLR	-	Systematic Literature Review
SMEs	-	Small and Medium Enterprises
SPSS	-	Statistical Package for the Social Sciences
TAM	-	Technology Acceptance Model
TOE	-	Technology-Organization-Environment
VIF	-	Variance Inflation Factor

LIST OF PUBLICATIONS

1. Khaled Aldarab`ah, Al-Shami SA., 2025 An Empirical Investigation of Business Intelligence Adoption in Jordanian Healthcare Organizations Using the TOE Framework. *International Journal of Academic Research in Business and Social Sciences*. https://doi.org/10.6007/IJARBSS/v15-i5/25286.
2. Khaled Aldarab`ah, Al-Shami SA., 2025. Systematic review of factors influencing adoption of business intelligence systems. *Journal: Discover sustainability.* Accepted for publication.
3. Khaled Aldarab`ah, Al-Shami SA., 2025. Investigating the Drivers of Business Intelligence Adoption in the Jordanian Banking Industry: An Integrated TAM-TOE Model Approach. *Journal*: *Humanities and Social Sciences Communications.* Under Review.

CHAPTER 1

INTRODUCTION

1.1 Background

The fast-changing nature of today's business world, globalisation, fierce market competition, and the advancement of information technology has led to major changes in the business landscape (Shehadeh, Almohtaseb, et al., 2023). The paradigm shift in modern technology has made the widespread adoption of information technology (IT) essential, playing a fundamental role in driving economic growth and transforming the business world in all its forms (Alkhwaldi, 2024). Failure to take advantage of these technological advancements results in a competitive loss, whereas focusing on technological innovation has been proven to enhance such businesses' likelihood of success (Marei et al., 2023). Moreover, the focus of IT innovation within organisations has primarily been on information gathering, limiting their ability to analyse large datasets and integrate key principles for effective decision-making. In this context, a technological advancement that has received considerable attention is business intelligence (BI) systems (Salisu et al., 2021). These systems hold significant potential as sources of IT business value, offering advanced decision-making capabilities (Ukhalkar et al., 2021; Yogev et al., 2013) and enabling rapid responses to competitive markets (S. Ahmad, Miskon, Alabdan, et al., 2020a).

Driven by developments in organisational information systems (IS) and technology BI systems emerged in the late 1990s (Ain et al., 2019; H. Chen et al., 2012). A BI system is commonly recognised as a comprehensive collection of tools, methods, and strategies that enable organisations to consolidate and analyse extensive data sets, providing insights into their strengths, weaknesses, and potential opportunities (Grublješič et al., 2019; Qatawneh,

2024). As an IS, the BI system enhances decision-making by managing, gathering, and integrating both unstructured and structured data (Salisu et al., 2021).

BI Technology has been an effective driver for change in the financial sector of developing countries, playing a pivotal role in reshaping the landscape of financial services (Bany Mohammad et al., 2022). according to Nyanga et al. (2020), BI is essentially a company's skill in using its resources and methods to generate knowledge. This knowledge is crucial for ensuring that accurate information reaches the appropriate individuals, at the right time, and via the most suitable means. Nyanga et al. (2020) emphasizes that the primary goal of BI is to aid a company in making more informed and effective decisions. At its core, BI involves the strategic use of data, analytical tools, and technologies to glean actionable insights, drive decision-making processes, and enhance operational efficiency (Al-Afeef et al., 2023; Phillips-Wren et al., 2021). In the context of developing countries, where the banking sector frequently faces distinctive challenges such as limited infrastructure, diverse customer needs, and regulatory hurdles (Agingi, 2021), BI technology represents a cutting-edge and highly effective solution (S. Ahmad, Miskon, Alabdan, et al., 2020b).

The dynamic nature of the global economy, alongside increasing competition and evolving customer expectations, drives banks to adopt more sophisticated and agile approaches to data management and analysis (Iraqi et al., 2021). BI tools enable banks to leverage the power of big data, transforming vast volumes of transactional data into meaningful insights (Al-Momani et al., 2023). This capability is crucial in understanding customer behavior, market trends, and risk patterns, which are integral to tailoring financial products and services that meet the specific needs of the populace in developing countries.

As a result, and because of the importance of BI and its pivotal role in the banking sector, there is a need to explore and understand the multifaceted factors that affect the adoption process.

1.2 Problem Statement

The Jordanian banking sector holds a critical position within the national economy and is progressively embracing digital solutions-particularly BI -to maintain competitiveness in response to rapid technological advancements and shifting customer expectations (Shehadeh, 2025). BI has become instrumental in improving operational efficiency (Shehadeh, Almajali, et al., 2023), facilitating strategic decision-making (Alzghoul et al., 2024), managing risks (Alhawamdeh et al., 2024), and enhancing customer service (Alzoubi et al., 2023).

Prior studies have extensively explored BI's benefits across various banking dimensions, including competitive advantage (Asghar et al., 2021), entrepreneurial potential (Freihat et al., 2023), and bank performance (Ababseh, 2022; Nithya and Kiruthika, 2021; Owusu, 2017). Furthermore, research has examined BI's applications in credit risk management (Alzeaideen, 2019), bank sustainability (Tunowski, 2020), and operational efficiency perceptions of profitability (M. M. Rahman, 2023). However, as highlighted by Mujahed et al. (2024), prior research has largely focused on client-side adoption, especially mobile banking, overlooking broader organizational digital transformation. Despite these recognized advantages, empirical investigations into BI adoption and implementation remain notably limited, particularly within developing countries such as Jordan, as shown in Table 2.8. Most technology adoption research in banking has focused predominantly on developed economies, neglecting the distinct socio-economic, technological, and cultural contexts prevalent in emerging markets.

Various theories, models, and frameworks have been employed in prior studies to investigate the factors influencing BI adoption across diverse contexts, including the banking sector, such as the Technology Acceptance Model (TAM) (Alsibhawi et al., 2023; Kester and Preko, 2015; E. M. M. Yusof et al., 2019), Technology-Organization-Environment

(TOE) framework (Jaradat, Al-Dmour, et al., 2024; A. B. Mohammed et al., 2024; Stjepić et al., 2021), Diffusion of Innovation (DOI) (Jalil and Hwang, 2019; Zoubi et al., 2023), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Alkhwaldi, 2024; Andar and Kasparova, 2024; ARNET ZITHA, 2023a). However, prior research primarily addresses direct organizational-level influences on technology adoption decisions, largely neglecting individual-level perceptions critical to user acceptance.

In Jordan's banking context specifically, existing studies have primarily employed single theoretical frameworks-particularly TOE (e.g., Alzoubi et al., 2023; Mohammed et al., 2024; Qatawneh, 2024)-without adequately addressing individual-level determinants, such as perceived usefulness or complexity. Consequently, the integration of TAM and TOE frameworks, which could holistically capture both individual and organizational perspectives, remains particularly absent in Jordan's banking sector, as shown in Table 2.2.

Therefore, this study uniquely employs an integrated TAM–TOE framework to investigate BI adoption within Jordan's banking sector. The integration of TAM with TOE bridges a significant theoretical and empirical gap by simultaneously addressing individual perceptions and organizational/contextual influences. This approach provides a nuanced and comprehensive understanding of BI adoption processes, moving beyond prior research that has predominantly utilized standalone frameworks and overlooked critical individual-level factors.

1.3 Purpose of Research

The purpose of this research is to comprehensively investigate and enhance the adoption of BI within the commercial banking sector of developing countries, with a particular focus on Jordanian banks. This study is critical given the increasing complexity and dynamism of the global financial landscape, where the effective implementation of BI systems significantly contributes to competitive advantage and operational efficiency.

The research aims to systematically identify and analyse key determinants influencing BI adoption, examining factors such as technological infrastructure, regulatory frameworks, environmental contexts, and behavioral dimensions. Furthermore, the study seeks to explore how these factors individually and collectively interact, either facilitating or hindering the integration of BI systems into banking processes. Building upon this foundational analysis, the primary objective is to develop and empirically validate a comprehensive model for BI adoption and assimilation tailored specifically to the conditions and constraints of developing countries, particularly Jordan. By integrating the Technology Acceptance Model (TAM) and the Technology-Organization-Environment (TOE) frameworks, this research provides an in-depth examination of both organizational and individual dimensions influencing BI usage, addressing a notable gap in existing literature.

Additionally, this study investigates employee behavioral perspectives across organizational levels, examining the usability and complexity of BI systems within their daily workflows. Ultimately, this validated model aims to provide practical guidance for banks in developing nations, enhancing their ability to effectively adopt and utilize BI solutions to improve decision-making processes and achieve sustainable operational success.

1.4 Research Questions

Based on the research Purpose, this study intends to answer the following main research questions:

RQ1: What are the technological and organizational factors that influence the intention to adopt BI in Jordanian commercial banks?

RQ2: How do technological and organizational factors interact to influence perceived usefulness and perceived ease of use, and how does this interaction consequently affect the intention of Jordanian commercial banks to adopt BI?

RQ3: What environmental determinants significantly affect the intention to adopt BI in Jordanian commercial banks?

RQ4: To what extent does the proposed integrated TAM-TOE model empirically explain and predict the intention to adopt BI in Jordanian commercial banks?

1.5 Research Objectives

The main objective of this study is to investigate the key technological, organizational, environmental, and behavioural factors influencing the intention to adopt BI systems in Jordanian commercial banks by developing and empirically validating an integrated TAM and TOE framework. Based on the purpose of the research, the following are the research objectives:

RO1: To identify the technological and organizational factors influencing the intention to adopt BI in Jordanian commercial banks

RO2: To examine the connection between organizational and technological factors and their effect on perceived usefulness and perceived ease of use, which consequently influences the inclination to adopt BI in Jordanian commercial banks.

RO3: To investigate the environmental determinants that impact the intention to adopt BI in Jordanian commercial banks.

RO4: To empirically validate the proposed integrated TAM-TOE model for the intention to adopt BI in Jordanian commercial banks.

1.6 Scope of Research

Globally, the telecommunications and information technology (ICT) sector has experienced substantial growth, significantly impacting industries like banking (Gaudio et al., 2020). This trend is particularly evident in regions such as Asia and the Middle East, with Jordan serving as a compelling case among developing nations. Jordanian commercial banks, central to the nation's economic development (Alkhazaleh, 2017; Dabbas, 2023),