From Paper to Intelligence: Evaluating the AI Records Digitization Management in Malaysia

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ABSTRACT

The growing demand for digital transformation has encouraged public agencies to explore more efficient ways of managing organizational records. However, many agencies in Malaysia continue to rely on paper-based and semi-digital processes, limiting the efficiency, accessibility, and effective use of information. Artificial Intelligence (AI) offers new opportunities to transform records digitization through automated data capture, intelligent classification, metadata extraction, and information retrieval. Despite its potential, the adoption of AI-powered records digitization remains influenced by technological, organizational, and human-related challenges. Therefore, this study aims to examine the factors influencing AI adoption for records digitization in Malaysian public agencies and to develop and validate an integrated Diffusion of Innovation (DOI), Technology Acceptance Model (TAM), and Technology-Organization-Environment (TOE) framework. Specifically, it investigates the influence of innovation attributes, the mediating roles of user attitude and digital literacy, and the moderating effects of top management support, ICT infrastructure, and organizational culture. A quantitative research approach will be employed, using questionnaire surveys involving employees from Malaysian public agencies. Data will be analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS 4.1. The findings are expected to provide practical insights into strengthening AI adoption strategies and supporting more efficient, reliable, and sustainable records management practices in Malaysia.

Keyword: AI records digitization, records management, records digitization, artificial intelligence (AI)

INTRODUCTION

Background of the Study

In recent years, digital transformation has emerged as a critical priority for governments and organizations worldwide. In Malaysia, efforts to modernize public services and enhance operational efficiency have accelerated the adoption of digital technologies across multiple sectors. Among these technologies, Artificial Intelligence (AI) holds practical promise for transforming how records are managed and preserved. AI applications such as intelligent Optical Character Recognition (OCR), automated classification, metadata extraction, and content analytics can significantly improve the efficiency, accuracy, and accessibility of record systems, while also supporting long-term preservation and compliance with legal and regulatory requirements. The digitization of records has become a cornerstone of modern organizational management, particularly in an era were data drives decision-making and service delivery. Records are not only administrative tools but also legal, historical, and strategic assets. As organizations generate increasing volumes of information, traditional manual or semi-digital record-keeping methods are becoming inefficient, error-prone, and difficult to manage. The need for more intelligent, scalable, and automated solutions has positioned AI as a transformative force in the management and preservation of records.

Problem Statement

Despite this potential, the adoption of AI for records digitization remains uneven across both public and private organizations. Many continue to rely heavily on manual or semi-digital processes, limiting the benefits of

digital transformation. The reasons for this slow adoption are complex and multifaceted, encompassing technological, organizational, and human factors. Challenges such as record authenticity, data integrity, legal compliance, and trust in AI decision-making are particularly critical in the context of records management. Existing studies on technology adoption focus primarily on general information systems and rarely address the specific challenges associated with AI can enable records digitization. Established frameworks like the Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI) theory have seldom been adapted or integrated to reflect the realities of record systems, especially within the public sector. This gap leaves policymakers and practitioners without robust tools to design effective strategies, policies, and frameworks for AI implementation in records management.

Therefore, a pressing need for research that develops a context-specific adoption model for AI in records digitization. Such a model would explain how organizational and individual factors influence adoption behaviour while providing evidence-based guidance to support sustainable digital transformation. By addressing this gap, the study aims to contribute not only to theoretical knowledge on technology adoption but also to practical policymaking, organizational strategy, and the modernization of record systems in Malaysia. Furthermore, existing studies on digital record management in Malaysia have basically explored technological or policy aspects with limited empirical evidence adopted by integrated theoretical approach. It is a crucial need for this study that can apply the technology adoption of digitization records by using the integrated DOI-TAM-TOE framework to investigate the factors influencing the technology adoption of records digitization in public agencies. Besides, the TOE framework can identify the moderating effects of organizational context towards the adoption of digitization records. Instead of using UTAUT2, the DOI is preferable since introducing the public agencies to new technology that focuses on converting the manual records to digitization records instead of using the records management systems.

Research Objectives

General Objectives

1. To examine the factors influencing the AI adoption of records digitization in Malaysian public agencies using an integrated DOI-TAM-TOE framework.
2. To develop and validate integrated DOI-TAM-TOE model for AI adoption of records digitization in Malaysian public agencies.

Specific Objectives

1. To determine the influence of **DOI Innovation attributes** (relative advantage, compatibility, complexity, trialability, and observability) on the AI adoption of records digitization in Malaysian public agencies.
2. To identify the **mediating effect** of user attitude and digital literacy in influencing the AI adoption of records digitization in Malaysian public agencies.
3. To evaluate the **moderating effect** of organizational context of TOE (top management support, ICT infrastructure, and organizational culture) on the AI adoption of records digitization in Malaysian public agencies.

Research Questions

1. What DOI Innovation attributes influence the adoption of the AI adoption of records digitization in Malaysian public agencies?
2. What is the mediating effect of user attitude and digital literacy towards the relationship between DOI and AI adoption of records digitization in Malaysian public agencies?
3. What is the moderating effect of organizational context of TOE towards relationship between DOI and AI adoption of records digitization in Malaysian public agencies?
4. What is the effect of the integrated DOI-TAM-TOE framework in explaining the AI adoption of records digitization in Malaysian public agencies?

LITERATURE REVIEW

Records Digitization

Records digitization generally refers to converting physical documents into electronic formats and managing them through electronic records or document management systems. In public agencies, this transition is often framed as part of broader digital government initiatives aimed at improving transparency, efficiency, and accountability. Recent studies suggest that electronic records management has shifted from being a purely administrative function to a strategic component of digital governance [1]. Digital records systems also reshape how information flows within organisations. Instead of relying on manual file circulation, employees can access and share records more quickly, which helps reduce processing time and supports everyday productivity. Empirical research indicates that system quality, training, and organisational readiness influence how effectively government staff use electronic records management systems in practice [1][2]. In developing digital government contexts such as Malaysia, electronic records management is increasingly embedded within institutional governance structures. Public organisations adopt ERMS platforms not only to manage documents but also to support policy implementation, data transparency, and integrated service delivery [3].

Evolution of Digital Records Management in the Public Sector

The shift from paper-based records to digital environments has gradually transformed workflows in public agencies. Traditionally, records management responsibilities were limited to archivists or specialised administrative units. However, electronic records systems now require participation across organisational levels, turning digitization into both a technological and organisational transformation [4]. Governments worldwide continue to invest in electronic document and records management systems to improve accessibility, compliance, and efficiency. Systematic reviews emphasise that adoption outcomes depend not only on technological capability but also on organisational support, management commitment, and alignment with public sector policies [4]. Scholars also note that long-term sustainability in digital records initiatives requires staff competencies, governance frameworks, and preservation strategies. Without adequate training or policy guidance, agencies may struggle to fully realise the benefits of digitization even when infrastructure is already available [1][2].

AI Adoption of Records Digitization

From a technological perspective, perceived usefulness, compatibility with existing workflows, and system quality play important roles in shaping employees' acceptance of electronic records systems. Research examining EDMS implementation in Malaysian public sector contexts shows that staff are more willing to adopt digital records when systems are reliable and aligned with daily administrative tasks [1]. Similarly, broader e-government adoption studies highlight the influence of perceived attitude and technological readiness on behavioural intention among government employees [2]. Organisational factors are equally significant. Management support, staff training, and institutional readiness have been consistently identified as key drivers of ERMS adoption. A recent systematic literature review found that relative advantage, compatibility, and leadership commitment remain among the strongest predictors of successful implementation, particularly in developing country settings [4]. These findings reinforce the view that adoption outcomes depend not only on technology design but also on organisational culture and change management practices.

Environmental pressures also shape adoption decisions in public agencies. Government policies, regulatory requirements, and digital transformation agendas often encourage agencies to modernise their records systems. Case studies of local government archive management initiatives demonstrate how national digital transformation strategies can accelerate digitization efforts by creating institutional incentives and governance frameworks [3]. Overall, recent literature suggests that the adoption of records digitization is best understood through integrated theoretical lenses such as the Technology–Organization–Environment (TOE) framework and technology acceptance models. These approaches highlight that successful adoption requires alignment between technological capability, organisational readiness, and external policy environments rather than reliance on technology alone.

Diffusion of Innovation (DOI)

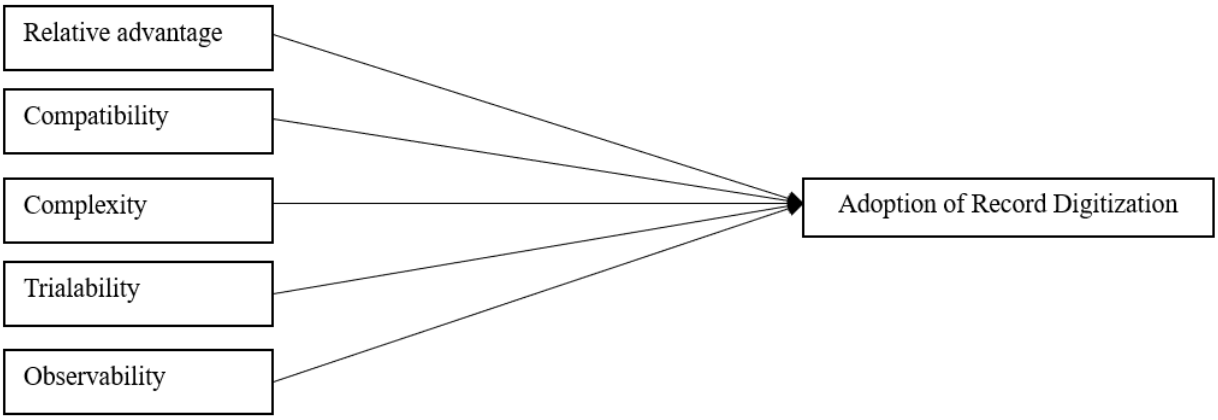


Figure 1: Theoretical framework Diffusion of Innovation (DOI) by Everett Rogers (2003)

This study applies Rogers' Diffusion of Innovation (2003) [5] to examine the factors influencing the adoption of digitalization records in transforming from manual (paper-based) records to digital records. Furthermore, DOI will help to explain why some public agencies adopt digitalization records rapidly, while others resist or delay.

Technology-Organization-Environment (TOE)

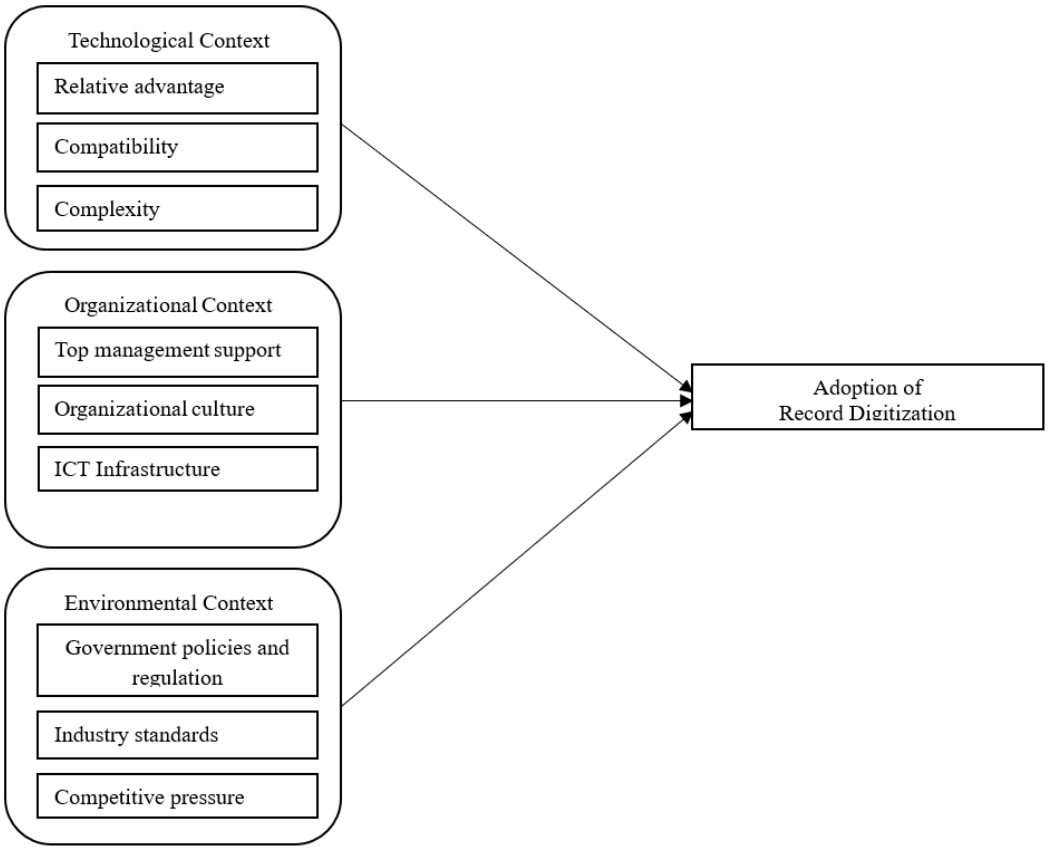


Figure 2: Theoretical framework Technology-Organization-Environment (TOE) by Tornatzky & Fleischer (1990)

The second theory used in this study is the Technology-Organization-Environment (TOE) that explains how the public agencies adopt and implement new technologies. This framework is influenced by three interrelated contexts that include technological, organizational, and environmental factors. The variable in the

technological context is used as a part of variables under the DOI for this study. Thus, the organizational context for this study is used a moderating variable in the integrated DOI-TAM-TOE framework.

Integrated DOI-TAM-TOE

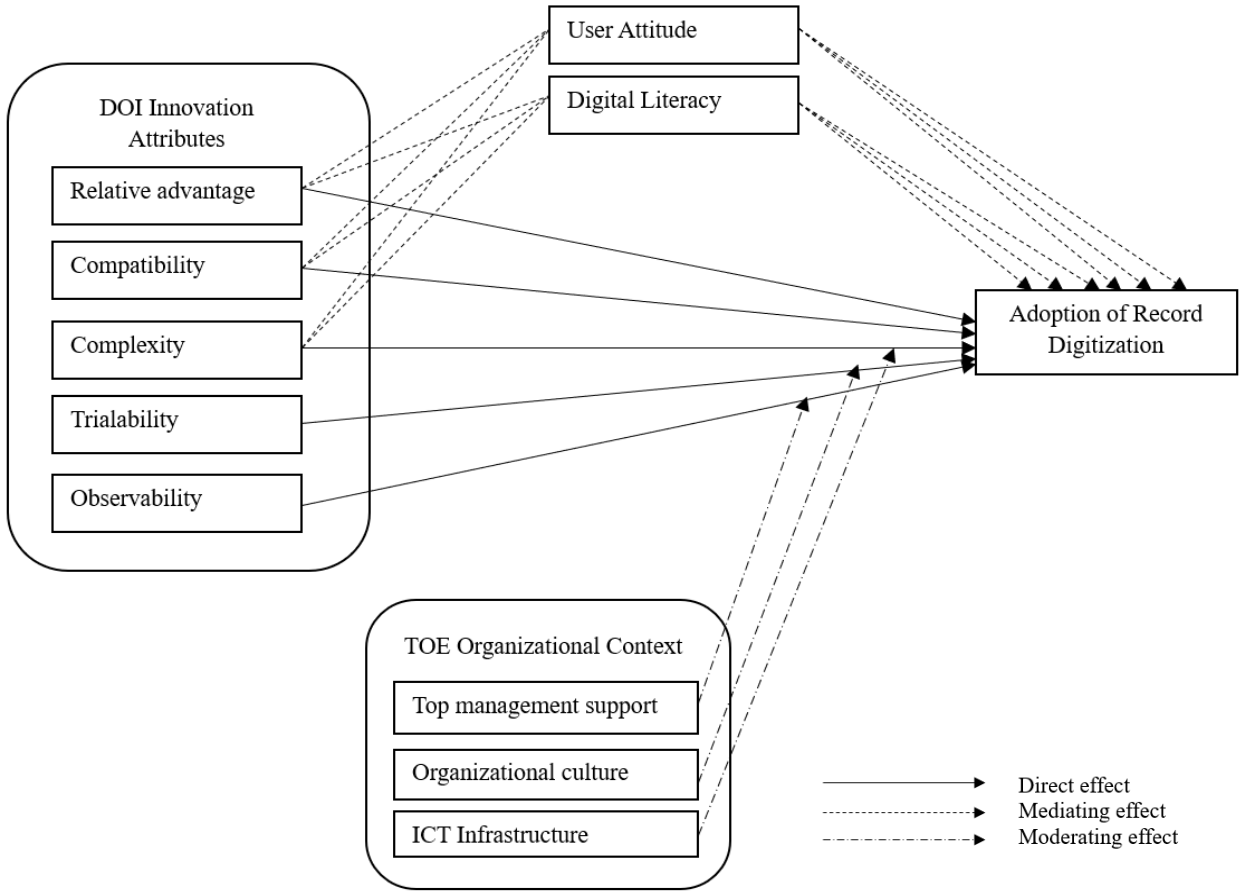


Figure 3: Integrated DOI-TAM-TOE Theoretical framework

The above theoretical framework is an integrated framework of DOI-TAM-TOE. The main theory used in this study is DOI. TAM variables used in this study that compatible with DOI is the relative advantage (perceived usefulness), compatibility (perceive ease of use), complexity (perceived usefulness) and the mediating variable of user attitude. Furthermore, TOE framework only includes two contexts that include the technological context (relative advantage, compatibility, complexity) under the DOI and the organizational context that act as moderating variables that include the top management support, organizational culture and ICT infrastructure. Yet TAM and DOI can be combined in one research study. DOI explains innovation characteristics and social influence, while TAM explains individual acceptance. Integrating both provides a comprehensive understanding of technology adoption.

Hypotheses Development

H1: The higher relative advantage will influence more positive adoption of digitalization records in Malaysian public agencies.

H2: The higher compatibility will influence more positive adoption of digitalization records in Malaysian public agencies.

H3: The higher complexity will influence more positive adoption of digitalization records in Malaysian public agencies.

H4: The higher trialability will influence more positive adoption of digitalization records in Malaysian public agencies.

H5: The higher observability will influence more positive adoption of digitalization records in Malaysian public agencies.

H6: User attitude has positive mediating effect to influence adoption of digitalization records in Malaysian public agencies.

H7: Digital literacy has positive mediating effect to influence adoption of digitalization records in Malaysian public agencies.

H8: Top management support has positive moderating effect on influence adoption of digitalization records in Malaysian public agencies.

H9: ICT infrastructure has positive moderating effect on influence adoption of digitalization records in Malaysian public agencies.

H10: Organizational culture has positive moderating effect on influence adoption of digitalization records in Malaysian public agencies.

RESEARCH METHODOLOGY

This study implements a quantitative research design to test the hypotheses relationships among variables derived from the integrated DOI-TAM-TOE framework.

Population

The population for this study consists of employees working in Malaysian public agencies that include three out of five adopters for DOI that includes early majority, late majority and laggards. Early majority are the staff who adopt once the systems prove reliable. Late majority are the sceptical users who adopt due to pressure or necessity, and laggards are the users that prefer traditional manual records that may lack digital skills or trust in technology.

Sample Size

The sample size for this study is determined by using the G*Power 3.1 that is suitable for complex models with multiple constructs [6]. G*Power 3.1calculates sample size based on the number of predictors for this study. The endogenous construction for this study is adoption of digitalization records. Therefore, the predictor for this study is 10 and based on the number of the predictors, G*Power recommends a minimum sample size for this study is 118 respondents. Even though G*Power indicates a minimum number of 118 respondents, this study aims for a larger sample size between 200 until 300 respondents.

Sampling Technique

This study employs purposive sampling, a non-probability sampling technique in which participants are selected based on their roles, experience, and knowledge related to records digitization and AI adoption. In the context of public agencies, this includes records officers, IT personnel, digital transformation managers, archivists, and senior administrators who are directly involved in or responsible for records management and digitization initiatives. Purposive sampling is suitable for this study because AI adoption in records digitization requires specialized expertise and decision-making authority. Selecting respondents who have direct experience ensures that the data collected is relevant, accurate, and insightful.

Data Collection

Data for this study will be collected by using a structured questionnaire adapted from validate instruments in previous DOI, TAM, and TOE studies. This questionnaire consists of five sections:

Section A: Adoption of digitalization records

Section B: DOI constructs (relative advantage, compatibility, complexity, trialability, observability)

Section C: Mediating constructs (user attitude and digital literacy)

Section D: Moderating constructs (management support, ICT infrastructure, organizational culture)

Section E: Demographic background

Each item is using a five-point Likert scale ranging from (Strongly disagree) to 5 (Strongly agree) for section B. Items in section A, C and D are using a seven-point Likert scale ranging from (Very strongly disagree) to 7 (Very strongly agree). This study will ensure the instrument for this study to have both content and construct validity. Content validity is to ensure through an expert review and the constructs validity will be assessed using the factor analysis. The reliability of this study is assessed using Cronbach's alpha, with values of 0.70 or higher. Partial Lease Squares Structural Modeling (PLS-SEM) is utilized for data analysis. PLS-SEM is suitable for complex models with multiple constructs. Therefore, this study will be using SmartPLS 4.1 to analyze data for this study.

CONCLUSION

This study seeks to address the growing need for more intelligent and efficient records management practices in Malaysian public agencies through the adoption of Artificial Intelligence (AI)-powered records digitization. Although digital transformation initiatives have encouraged organisations to move away from traditional paper-based processes, the successful implementation of AI technologies depends on more than technological availability. Employee acceptance, digital literacy, organisational readiness, and management commitment also play important roles in ensuring successful adoption. By integrating the Diffusion of Innovation (DOI), Technology Acceptance Model (TAM), and Technology-Organization-Environment (TOE) frameworks, this study aims to provide a more comprehensive understanding of the factors influencing AI adoption in records digitization. The proposed framework considers innovation attributes, user attitude, digital literacy, and organisational factors to explain how these elements contribute to technology adoption within public agencies.

Through a quantitative research approach, the study is expected to generate empirical evidence that can support the development of effective AI adoption strategies. The findings may assist public agencies and policymakers in identifying existing challenges, strengthening organisational preparedness, and promoting responsible AI implementation while maintaining records authenticity, data integrity, security, and regulatory compliance. Ultimately, this research aspires to contribute to the advancement of records management in Malaysia by bridging the gap between traditional paper-based practices and intelligent digital solutions, supporting more accessible, efficient, and sustainable public sector administration.

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