

HARMONY IN PROGRESS:

**INTEGRATING SCIENCE, TECHNOLOGY,
AND
SOCIAL INNOVATION
FOR SUSTAINABLE DEVELOPMENT GOALS**



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YSS010 - UNLOCKING KNOWLEDGE: A TRANSFORMATIVE FRAMEWORK FOR BOOSTING OPEN DATA ADOPTION IN MALAYSIAN ACADEMIA

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ABSTRACT

The adoption of open data repositories (ODRs) among Malaysian academic researchers faces several barriers, including insufficient institutional support, technological challenges, and cultural resistance to data sharing. This research introduces an innovative framework that integrates the Technology Acceptance Model (TAM) and Technology-Organization-Environment (TOE) theory to address these barriers, promoting the adoption of ODRs. The framework is designed to enhance the perception of ODRs' ease of use and usefulness, while also fostering institutional and community support for open data practices. Aligned with the theme Harmony in Progress: Integrating Science, Technology, and Social Innovation for SDGs, this research aims to harmonize scientific, technological, and social efforts to achieve the Sustainable Development Goals (SDGs). By focusing on key factors such as technical infrastructure, institutional policies, and community influence, the framework offers a holistic approach to overcoming the challenges of open data adoption. The findings will provide actionable insights for academic institutions, policymakers, and researchers, advancing open science initiatives and contributing to global sustainability, quality education, and innovation efforts.

Keywords – Open Data Repositories, Adoption Framework, Malaysia, Open Science, Technology Acceptance, Sustainable Development Goals

INTRODUCTION

Open data repositories (ODRs) are pivotal for advancing scientific collaboration, transparency, and innovation, particularly in the context of achieving the Sustainable Development Goals (SDGs). However, the adoption of ODRs in Malaysia remains slow, primarily due to a combination of technological, institutional, and social factors. These barriers limit the potential of open data to contribute meaningfully to sustainable development. The proposed innovation, framed within the theme Harmony in Progress: Integrating Science, Technology, and Social Innovation for SDGs, presents a novel framework to overcome these challenges and foster a more open and collaborative research environment. By integrating the Technology Acceptance Model (TAM) and the Technology-Organization-Environment (TOE) framework, this research offers a holistic

approach to improving the adoption of ODRs among Malaysian academic researchers, thereby aligning with SDGs related to quality education (SDG 4),

innovation (SDG 9), and partnerships (SDG 17). The innovation aims to harmonize scientific advancement, technological progress, and social collaboration to drive impactful open data practices in Malaysia.

OBJECTIVE

The main objectives of this project are as follows:

- i. To propose a framework that integrates the TAM and TOE theories to address the key technological, institutional, and community factors influencing the adoption of open data repositories (ODRs) among Malaysian academic researchers.
- ii. To evaluate the impact of the proposed framework on improving data deposition behavior by addressing barriers such as limited institutional support, technical limitations, and cultural resistance.
- iii. To provide actionable recommendations for academic institutions, policymakers, and researchers to improve open data practices, thus contributing to the achievement of the SDGs.
- iv. To foster an inclusive and data-driven research environment in Malaysia by promoting sustainable open data practices that can contribute to global innovation, education, and societal development.

DESCRIPTION OF THE PROJECT

This project focuses on developing a framework designed to enhance the adoption of open data repositories (ODRs) within the Malaysian academic context. The innovation lies in integrating two well-established models—Technology Acceptance Model (TAM) and Technology-Organization-Environment (TOE)—to analyze the complex interplay of technological, institutional, and social factors that influence data deposition behavior. The framework is built to tackle key barriers such as lack of technical infrastructure, insufficient institutional support, and cultural resistance to data sharing.

Aligned with the theme of Harmony in Progress: Integrating Science, Technology, and Social Innovation for SDGs, the framework takes a multi-dimensional approach to enhance open data adoption by addressing:

Technological Factors: Overcoming technical barriers like system interoperability, security, and platform usability to ensure researchers find ODRs accessible and user-friendly.

Institutional Factors: Strengthening institutional support, including policy development, training, and incentives, to promote ODR usage as part of institutional strategies for open science and research excellence.

Community Influence: Harnessing social collaboration and peer influence to create a culture of data sharing and openness among academic researchers, thus promoting a collective effort to achieve the SDGs.

By addressing these factors, the framework not only improves the effectiveness of open data practices but also aligns with Malaysia's commitment to the SDGs, promoting sustainable development through transparent, accessible, and collaborative research data.

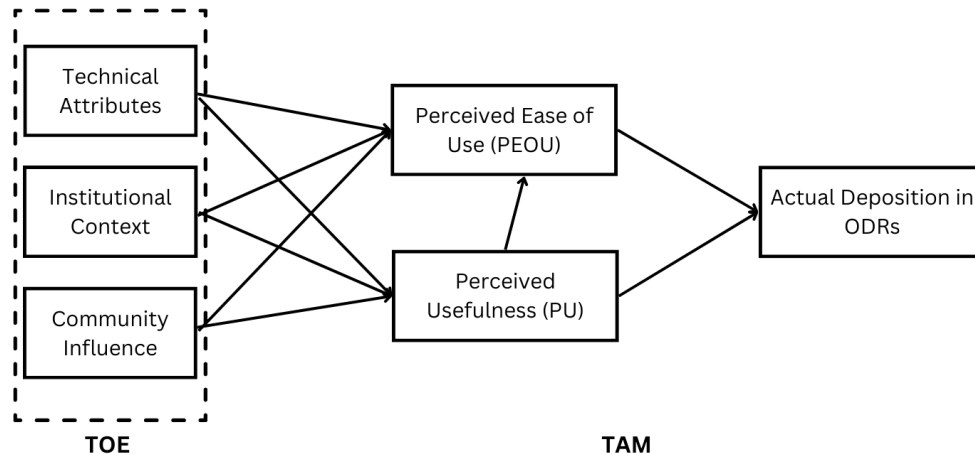


Figure 1: Proposed conceptual framework for Open Data Repository (ODR) adoption in Malaysia integrating Technology Acceptance Model (TAM) and Technology-Organization-Environment (TOE) model.

NOVELTY

The novelty of this innovation lies in its ability to combine scientific, technological, and social aspects to create a framework that addresses the unique challenges faced by Malaysian researchers in adopting open data repositories. The framework's integration of the TAM and TOE models is a pioneering effort to tailor these models to Malaysia's academic and research context. Additionally, the approach moves beyond traditional technology adoption frameworks by incorporating community influence and institutional support, which are critical social factors that significantly impact open data practices.

This innovation contributes to the SDGs by promoting interdisciplinary collaboration, encouraging social innovation, and fostering sustainable development through enhanced data sharing. By understanding the challenges specific to Malaysia and integrating cultural, technological, and institutional contexts, the framework provides a localized solution that can contribute to global open science initiatives. Its holistic approach sets it apart from existing models, offering new insights into how science, technology, and social collaboration can harmonize for greater impact.

CONCLUSION

In conclusion, the proposed framework offers an innovative and comprehensive solution to the challenges faced by Malaysian academic researchers in adopting open data

repositories. By integrating the TAM and TOE theories, the framework addresses technological, institutional, and social factors that hinder the effective use of ODRs. This innovation, underpinned by the theme Harmony in Progress: Integrating Science, Technology, and Social Innovation for SDGs, provides a pathway to achieving the SDGs through improved data sharing, collaboration, and transparency in research. The framework not only aligns with Malaysia's national open science initiatives but also contributes to global efforts toward sustainable development, quality education, and innovation. The insights from this study will be valuable for policymakers, academic institutions, and researchers seeking to enhance open data practices, fostering a data-driven, collaborative, and sustainable research environment.

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