UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DETERMINANTS OF INTENTION TO USE DIGITAL REPOSITORIES AMONG MALAYSIAN TECHNICAL UNIVERSITIES NETWORK STAFF AND STUDENTS

TENGKU IKMAL HAKIMI BIN ENGKU MOHAMED ZULKEFLI

MASTER OF SCIENCE IN TECHNOLOGY MANAGEMENT

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DEDICATION

In deep gratitude and appreciation, I dedicate this thesis to my beloved mother, Zanariah Binti Ismail, and in loving memory of my late father, Engku Mohamed Zulkefli Bin Tuan Pa. To my lovely family, whose unwavering support and guidance have been my anchor throughout this journey, I owe you immeasurable thanks.

To my friends, your inspiring advice has lit the path when it seemed darkest, and I extend my heartfelt dedication to you.

I am profoundly indebted to my esteemed supervisors, Dr. Johanna Binti Abdullah Jaafar, and my co-supervisors, Dr. Mohd Amin Bin Mohamad. Your encouragement and unwavering determination have been instrumental in shaping this work.

Above all, I offer my gratitude to Allah, the source of my strength, knowledge, and wisdom in every endeavour. With a heart full of thanks, I present this thesis.

ABSTRACT

Digital repositories are vital in knowledge and documentation management at various organisations. It is part of the initiatives used in green computing technology to reduce the negative impact on the environment. It built a sound infrastructure to store, manage, and reuse digital materials. Technology, including advancements in the Internet of Things (IoT), is a key tool in developing digital repositories. Notably, since the COVID-19 pandemic, demand for digital documentation has increased, especially in higher education, due to online classes, meetings, and auditing processes. Thus, digital repositories would benefit higher education institutions, contributing to a cost-saving, paperless environment and serving as readily available data, especially when executing online tasks. Despite it has benefits, practical problems such as usability concerns and lack of awareness cause fewer people to use the technology. However, studies on the acceptance of digital repositories are still scarce. Moreover, it is yet to be proven whether users in higher education institutions (HEIs) will accept this technology and effectively use it once it is implemented. Therefore, this study aims to investigate the determinants of Malaysian Technical Universities staff and students' intention to use digital repositories using the Unified Theory of Acceptance and Use of Technology (UTAUT), reflecting the Theory of Planned Behaviour (TPB) construct, i.e., attitude. This study used stratified sampling from UTeM, UTHM, UMP, and UniMAP, ensuring at least 100 samples from each institution. The academic staff sample consisted of lecturers grade 45 and above, while the non-academic staff consisted of individuals grade 29 and above. The sampling of students was conducted randomly across different academic years. By using a quantitative approach, the researcher collected a total of 199 samples. This study used partial least squares (PLS) to test the proposed hypothesis. The study's findings indicate that social influence and green attitudes positively affect the intention to use digital repositories among MTUN. However, performance expectancy, effort expectancy, and facilitating conditions were not significant. Additionally, there were differences between staff and students in multiple group analyses. Performance expectancy, facilitating condition and green attitude positively affect the intention to use digital repositories among MTUN staff. However, only a green attitude positively affects students' intention to use digital repositories. The findings of this study will contribute to the literature on the technology acceptance model based on the technology used in the context of higher education institutions. The intention to use digital repositories among MTUN is significantly influenced by performance expectancy, facilitating conditions, social influence, and green attitude, underscoring the crucial role of digital repositories in achieving sustainable development. The Sustainable Development Goals address social, economic, and environmental challenges, aiming to achieve sustainable development by 2030. The findings help to contribute to Goals 4 (Quality Education), i.e., increasing access to educational resources, and promoting lifelong learning, 12 (Responsible Consumption and Production), i.e., reducing the use of physical documents and 13 (Climate Action) reduction of environmental impact. Additionally, the findings hold significant potential to inform university decision-makers on the efficacy of investing in greener technologies and environmentally responsible strategies. Moreover, it would guide the successful

implementation of digital repository platforms within higher education institutions, particularly universities. This research contributes tangibly to advancing university sustainability initiatives and digital infrastructure by providing concrete insights and actionable recommendations.

PENENTU NIAT UNTUK MENGGUNAKAN REPOSITORI DIGITAL DALAM KALANGAN KAKITANGAN DAN PELAJAR RANGKAIAN UNIVERSITI TEKNIKAL MALAYSIA

ABSTRAK

Repositori digital penting dalam pengetahuan dan pengurusan dokumentasi di pelbagai organisasi. Ia adalah sebahagian daripada inisiatif yang digunakan dalam teknologi pengkomputeran hijau untuk mengurangkan kesan negatif terhadap alam sekitar. Ia membina infrastruktur yang baik untuk menyimpan, mengurus, dan menggunakan semula bahan digital. Teknologi, termasuk kemajuan dalam Internet of Things (IoT), adalah alat utama dalam membangunkan repositori digital. Terutama, sejak pandemik COVID-19, permintaan untuk dokumentasi digital telah meningkat, terutamanya dalam pendidikan tinggi, disebabkan oleh kelas dalam talian, mesyuarat, dan proses pengauditan. Oleh itu, repositori digital akan memberi manfaat kepada institusi pengajian tinggi. Ia akan menyumbang kepada persekitaran penjimatan kos, tanpa kertas dan berfungsi sebagai data yang tersedia, terutamanya apabila melaksanakan tugas dalam talian. Walaupun ia mempunyai faedah, masalah praktikal seperti kebimbangan kebolehgunaan dan kurang kesedaran menyebabkan kurang orang menggunakan teknologi. Walau bagaimanapun, kajian mengenai penerimaan repositori digital masih terhad. Selain itu, masih belum dapat dibuktikan sama ada pengguna di institusi pengajian tinggi (IPT) akan menerima teknologi ini dan berhasrat menggunakannya sebaik sahaja ia dilaksanakan. Oleh itu, kajian ini bertujuan untuk menyiasat penentu niat untuk menggunakan repositori digital dalam kalangan kakitangan dan pelajar rangkaian Universiti Teknikal Malaysia menggunakan Teori Penerimaan dan Penggunaan Teknologi Bersepadu (UTAUT), teori tingkah laku berencana (TPB), iaitu sikap. Kajian ini menggunakan persampelan berstrata daripada UTeM, UTHM, UMP dan UniMAP dengan memastikan sekurang-kurangnya 100 sampel daripada setiap institusi. Sampel staf akademik terdiri daripada pensyarah gred 45 dan ke atas, manakala staf bukan akademik terdiri daripada individu gred 29 dan ke atas. Persampelan pelajar dijalankan secara rawak yang berbeza tahun akademik. Dengan menggunakan pendekatan kuantitatif, penyelidik mengumpul sejumlah 199 sampel. Kajian ini menggunakan Kuasa Dua Terkecil Separa (PLS) untuk menguji hipotesis yang dicadangkan. Penemuan kajian menunjukkan bahawa pengaruh sosial dan sikap hijau memberi kesan positif terhadap niat untuk menggunakan repositori digital dalam kalangan MTUN. Walau bagaimanapun, jangkaan prestasi, jangkaan usaha dan keadaan kemudahan tidak signifikan. Selain itu, terdapat perbezaan antara kakitangan dan pelajar dalam analisis pelbagai kumpulan. Jangkaan prestasi, keadaan kemudahan dan sikap hijau memberi kesan positif kepada hasrat untuk menggunakan repositori digital dalam kalangan kakitangan MTUN. Walau bagaimanapun, hanya sikap hijau yang memberi kesan positif kepada niat pelajar untuk menggunakan repositori digital. Dapatan kajian ini akan menyumbang kepada penulisan mengenai model penerimaan teknologi berdasarkan teknologi yang digunakan dalam konteks institusi pengajian tinggi. Hasrat untuk menggunakan repositori digital dalam kalangan MTUN sangat dipengaruhi oleh jangkaan prestasi, keadaan memudahkan, pengaruh sosial, dan sikap hijau, menekankan peranan

penting repositori digital dalam mencapai pembangunan mampan. Matlamat Pembangunan Mampan menangani cabaran sosial, ekonomi, dan alam sekitar, yang bertujuan untuk mencapai pembangunan mampan menjelang 2030. Penemuan ini membantu menyumbang kepada Matlamat 4 (Pendidikan Berkualiti), iaitu meningkatkan akses kepada sumber pendidikan, dan menggalakkan pembelajaran sepanjang hayat, 12 (Penggunaan dan Pengeluaran Bertanggungjawab), iaitu mengurangkan penggunaan dokumen fizikal dan 13 (Tindakan Iklim), pengurangan kesan terhadap alam sekitar. Di samping itu, penemuan ini mempunyai potensi besar untuk memaklumkan pembuat keputusan universiti mengenai keberkesanan melabur dalam teknologi yang lebih hijau dan strategi yang bertanggungjawab terhadap alam sekitar. Selain itu, ia akan membimbing kejayaan pelaksanaan platform repositori digital di institusi pengajian tinggi, terutamanya universiti. Penyelidikan ini menyumbang kepada usaha memajukan inisiatif kelestarian universiti dan infrastruktur digital dengan memberikan pandangan konkrit dan cadangan yang boleh diambil tindakan.

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LIST OF ABBREVIATIONS

AVE	-	Average Variance Extracted
CMV	-	Common Method Variance
CR	-	Composite Reliability
EFA	-	Exploratory Factor Analysis
UTAUT	-	Unified Theory of Acceptance and Use of Technology
MTUN	-	Malaysian Technical University Network
TPB	-	Theory of Planned Behaviour
PE	-	Performance Expectancy
EE	-	Effort Expectancy
SI	-	Social Influence
FC	-	Facilitating Condition
GA	-	Green Attitude
PLS-SEM	-	Partial Least Square-Structural Equation Model
MOHE	-	Ministry of Higher Education
MQA	-	Malaysian Qualifications Agency
TVET	-	Technical Education and Vocational Training
SMEs	-	Small and Medium Enterprises
OAIS	-	Open Archival Information System
OCR	-	Optical Character Recognition
TRA	-	The Theory of Reasoned Action
DTPB	-	Decomposed Theory of Planned Behavior
TAM	-	Technology Acceptance Model

SCT	-	Social Cognitive Theory
MM	-	Motivational Model
HTMT	-	Heterotrait-Monotrait Ratio
CFA	-	Confirmatory Factor Analysis
CB-SEM	-	Covariance-Based Structural Equation Modelling
VIF	-	Variance Inflation Factor
AVE	-	Average Variance Extracted

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LIST OF PUBLICATIONS

Hakimi, T. I., Jaafar, J. A., and Aziz, N. A. A., 2023. What factors influence the usage of mobile banking among digital natives? *Journal of Financial Services Marketing*, *2018*(0123456789). https://doi.org/10.1057/s41264-023-00212-0

Hakimi, T.I., Jaafar, J.A., Mohamad, M.A. and Omar, M. (2024). Unified theory of acceptance and use of technology (UTAUT) applied in higher education research: A systematic literature review and bibliometric analysis. *Multidisciplinary Reviews*, 7(12). Available at: https://doi.org/10.31893/multirev.2024303.

CHAPTER 1

INTRODUCTION

1.0 Chapter Overview

This chapter provides an overview of the background of the study, focusing on the integration of digital repositories in Malaysian higher education. It highlights initiatives like MyREN and DePAN 2.0, which demonstrate a commitment to modernising education for Industry 4.0. Additionally, MEIPTA and MyCeL are leading efforts to enhance the quality of e-learning by integrating technology and expanding education access through initiatives such as MOOCs. Besides, the researcher discussed the importance of digital repositories implementations in higher education that support the digitalisation technology agenda. Subsequently, the problem statements are highlighted, followed by a justification of the research gaps, which led to the formulation of research questions to answer the research objectives. Furthermore, the significance of the research and research scope is discussed. Finally, the key terminologies and thesis organisation are highlighted to guide the readers.

1.1 Background of The Study

In the context of globalised markets and localised RandD structures, higher education becomes one of the main factors facilitating economic performance. In the face of globalisation and digitalisation, substantial institutional changes, reforms, and merges of universities represent a challenge for higher education in the 21st century (Volchik, Oganesyan and Olejarz, 2018; Ogiemwonyi et al., 2023). These changes go hand in hand with economic development and global economic growth, as higher education significantly

impacts the financial performance of regions and countries (Volchik, Oganesyan and Olejarz, 2018). Human capital's contribution to economic growth is undeniable. Previous studies usually consider education to be a simple measurement of human capital and attempt to examine the impacts of education on economic growth (Maneejuk and Yamaka, 2021). Education and economic growth are hotly discussed, with much recent research focusing on higher education levels and their impact on economic growth. Higher education is essential to economic growth and competitiveness in all countries (Maneejuk and Yamaka, 2021). Higher education is more likely to produce graduates with the potential to invent new technology and become working persons, helping transform the country into a knowledge-based economy.

Higher education provides technology and innovation and delivers high-skilled workers to the labour market, enhancing economic growth (Maneejuk and Yamaka, 2021). Many economists have shown evidence supporting higher education's potential impact on developing and developed economies (Gyimah Brempong, Paddison and Mitiku, 2006; Holland et al., 2013; Volchik, Oganesyan and Olejarz, 2018; Maneejuk and Yamaka, 2021). The modern human capital theory introduced by Schultz provides fundamental support for analysing the influence of education on economic growth. Past studies revealed that education potentially affects economic growth (Schultz, 1961; Ganegodage and Rambaldi, 2011; Jin and Jin, 2014; Mercan and Sezer, 2014; Liao et al., 2019; Maneejuk and Yamaka, 2021).

The convergence of the digital economy, Industrial Revolution 4.0 (hereafter IR 4.0), and the COVID-19 pandemic has triggered a global transformation in higher education. Embracing this shift, institutions increasingly adopt Higher Education 4.0, integrating advanced technologies to enhance teaching, learning, and research. A crucial aspect of this transformation is the digitisation of resources, leading to the establishment of digital libraries and repositories (Sharma, 2019; Mayer et al., 2023). These repositories are pivotal in modernising higher education, providing a centralised platform for storing, managing, and accessing diverse digital assets. As institutions navigate the complexities of the digital age, the significance of these repositories in facilitating seamless access to scholarly articles, research data, and educational resources cannot be overstated (Aboraya et al., 2021). Their integration aligns with the broader global trend of digitalisation in education.

Beginning at the grassroots level, Malaysia has spearheaded various initiatives to embrace the challenges of Industry 4.0, exemplified by endeavours like the smart school initiative. The Smart School Paper 1997 laid the foundation for integrating Information and Communication Technology (ICT) in Malaysian schools, marking a significant milestone in the nation's pursuit of modern and technology-driven education (Chris Cloke, Sabariah Sharif and Abdul Said Ambotang, 2006). Its comprehensive vision is to advance education through technology. Emphasising the concept of "Smart Schools," the document envisions a transformative approach to learning by integrating innovative technologies into the educational system. Through this initiative, Malaysia aimed to harness the power of technology to enhance teaching methods, student engagement, and overall educational outcomes (Ministry of Education Malaysia, 2012).

In Malaysia's pursuit of preparing for Industry 4.0, significant initiatives such as establishing the Malaysian Research and Education Network (MyREN) in 2005 have played a crucial role. MyREN is a fundamental platform for fostering collaboration and connectivity among educational and research institutions nationwide, aiming to enhance research and education quality by facilitating high-speed networking infrastructure and promoting knowledge exchange (Rohani and Ow, 2012). This strategic initiative supports e-learning endeavours through reliable infrastructure for online courses and collaborative environments and aligns with Malaysia's broader push for global online education excellence, as outlined in the Malaysia Education Blueprint 2015-2025 (hereafter MEB 2015-2025 (HE)) (MOF, 2021; MoHE, 2021).

Additionally, the National e-Learning Policy (DePAN), launched in 2011 and later expanded into DePAN 2.0, serves to bolster Malaysia's higher education sector by cultivating top-tier human capital through ICT (Malaysia, 2014; Kementerian Pendidikan Tinggi Malaysia, 2015). Structured into three phases and aligned with MEB 2015-2025 (HE), DePAN 2.0 aims to elevate the competitiveness of Malaysian Higher Education Institutions internationally through systematic implementation and robust monitoring mechanisms, emphasising technological advancement, governance, pedagogical innovation, content quality, professional development, and cultural support (Kementerian Pendidikan Tinggi Malaysia, 2015). This evolution underscores a holistic strategy geared towards enhancing the reliability and effectiveness of Malaysia's educational infrastructure for the digital age.

In Malaysia, the advancement of e-learning within public universities is overseen by the Malaysian E-Learning Council for Public Universities (MEIPTA), which collaborates