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A FRAMEWORK OF MOBILE LEARNING ACCEPTANCE AND USAGE FOR MICRO-ENTERPRISES

IZZATUL UMAMI

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Izzatul Umami

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IZZATUL UMAMI

A thesis submitted
in fulfilment of the requirements for the degree of
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DECLARATION

I declare that this thesis, titled "A Framework of Mobile Learning Acceptance and Usage for Micro-enterprises," is the result of my research, except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature for any other degree.

Signature :.....

Name : Izzatul Umami

Date : 24/04/2025

APPROVAL

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

Signature :.....

Supervisor Name :Assoc. Prof. Ts. Dr. Ahmad Naim Bin Che Pee

Date :24-04-2025.....

DEDICATION

I dedicate this thesis to my husband (H. Mohammad Wahyudi, SE) and my mother (Hj Sumarlik binti Sadar), as well as my ummi children (Madihah Fulcaliyah Furaudah, Muhammad Fawwaz Arridho, and Dzakiyah Fikriyatunnisa'), who always support me in this thesis struggle. And Al-Fatihah sent to my father, Allohummayarham H. Muslim bin Munadi, as well as my teacher, Allohummayarham Prof. Chaerul Saleh, and my afterlife friend, Allohummayarham Hendi Sopian, M.Kom.

ABSTRACT

Adopting technology and information technology is a significant concern for micro-enterprises. Micro-enterprises are the dominant economic force and contribute significantly to the absorption of the national workforce, so their digital transformation plays an important role in driving inclusive economic growth and resilience. This research aims to develop and validate the framework for accepting and using mobile-based learning technology (Mobile Learning) for micro-enterprise actors. This framework integrates the Technology Acceptance Model (TAM) theory, Integrated Technology Acceptance and Use Theory 2 (UTAUT2), and the DeLone & McLean Information Systems Success Model. The three main variables in this framework are Entrepreneurial Readiness (ER), System Acceptance and Use (AUS), and System Net Benefits (NBS). The main method of this study uses a quantitative approach with predictive objectives using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, which is supported by experimental tests as a form of representative testing of the acceptance and use of technology framework. This study involved 237 micro food industry businesses in Jombang, East Java, Indonesia. Respondents were selected using purposive sampling techniques. We obtain data for research through Google Forms, which are distributed online via WhatsApp, Instagram, Telegram, and Facebook. The analysis revealed that AUS is a strong mediating variable between ER and NBS. The R^2 value for NBS is 0.933, indicating a very high level of predictive power in capturing the perceived benefits of using the system. The path coefficient showed a strong direct effect from ER to AUS ($\beta = 0.834$) and from AUS to NBS ($\beta = 0.766$), while the T-statistic for this path exceeded the minimum threshold of 1.96 ($T > 11.0$). As part of the non-functional validation and testing representation of the framework, the System Usability Scale (SUS) testing method was conducted on 37 system users, with an average score of 77.2 (the "good" category), indicating that the system is easy to use and acceptability and represents an AUS framework that effectively explains the behavioral dynamics of mobile learning adoption and benefit realization among micro-entrepreneurs. The system's Technical Performance Testing using Apache JMeter as a support representation of the Facilitating Condition indicator on the framework shows that the system is quite stable in handling user loads for the micro-enterprise scale. This research contributes to developing acceptance and usage frameworks, especially mobile-based learning strategies represented as a business legality system. Further research is suggested to extend testing of this framework to different sectors and regions, as well as develop integrations with adaptive technologies and artificial intelligence to support a more personalized learning experience.

RANGKA KERJA PENERIMAAN DAN PENGGUNAAN PEMBELAJARAN MUDAH ALIH UNTUK PERUSAHAAN MIKRO

ABSTRAK

Mengguna pakai teknologi dan teknologi maklumat adalah kebimbangan penting bagi Perusahaan Mikro. Perusahaan mikro adalah kuasa ekonomi yang dominan dan menyumbang dengan ketara kepada penyerapan tenaga kerja negara, jadi transformasi digital mereka memainkan peranan penting dalam memacu pertumbuhan dan daya tahan ekonomi yang inklusif. Penyelidikan ini bertujuan untuk membangunkan dan mengesahkan rangka kerja penerimaan dan penggunaan teknologi pembelajaran berasaskan mudah alih (Mobile Learning) untuk pelaku perusahaan mikro. Rangka kerja ini menyepadukan teori Model Penerimaan Teknologi (TAM), Teori Penerimaan dan Penggunaan Teknologi Bersepadu 2 (UTAUT2), dan Model Kejayaan Sistem Maklumat DeLone & McLean. Tiga pembolehubah utama dalam rangka kerja ini ialah Kesediaan Keusahawanan (ER), Penerimaan dan Penggunaan Sistem (AUS), dan Faedah Bersih Sistem (NBS). Kaedah utama kajian ini menggunakan pendekatan kuantitatif dengan objektif ramalan menggunakan pendekatan Partial Least Squares Structural Equation Modeling (PLS-SEM), yang disokong oleh ujian eksperimen sebagai satu bentuk ujian perwakilan penerimaan dan penggunaan rangka kerja teknologi. Kajian ini melibatkan 237 perniagaan industri makanan mikro di Jombang, Jawa Timur, Indonesia. Responden dipilih menggunakan teknik persampelan bertujuan. Kami memperoleh data untuk penyelidikan melalui Borang Google, yang diedarkan dalam talian melalui WhatsApp, Instagram, Telegram dan Facebook. Analisis mendedahkan bahawa AUS ialah pembolehubah pengantara yang kuat antara ER dan NBS. Nilai R^2 untuk NBS ialah 0.933, menunjukkan tahap kuasa ramalan yang sangat tinggi dalam menangkap faedah yang dirasakan daripada menggunakan sistem. Pekali laluan menunjukkan kesan langsung yang kuat dari ER ke AUS ($\beta = 0.834$) dan dari AUS ke NBS ($\beta = 0.766$), manakala statistik-T untuk laluan ini melebihi ambang minimum 1.96 ($T > 11.0$). Sebagai sebahagian daripada pengesahan bukan berfungsi dan perwakilan ujian rangka kerja, kaedah ujian Skala Kebolehgunaan Sistem (SUS) telah dijalankan ke atas 37 pengguna sistem, dengan skor purata 77.2 (kategori "baik"), menunjukkan bahawa sistem itu mudah digunakan dan boleh diterima dan mewakili rangka kerja AUS yang menerangkan dinamik tingkah laku penggunaan pembelajaran mudah alih dan realisasi faedah dalam kalangan usahawan mikro. Ujian Prestasi Teknikal sistem menggunakan Apache JMeter sebagai perwakilan sokongan penunjuk Keadaan Memudahkan pada rangka kerja menunjukkan bahawa sistem agak stabil dalam mengendalikan beban pengguna untuk skala perusahaan mikro. Penyelidikan ini menyumbang kepada membangunkan rangka kerja penerimaan dan penggunaan, terutamanya strategi pembelajaran berasaskan mudah alih yang diwakili sebagai sistem kesahihan perniagaan. Penyelidikan lanjut dicadangkan untuk memperluaskan ujian rangka kerja ini kepada sektor dan wilayah yang berbeza, serta membangunkan penyepaduan dengan teknologi penyesuaian dan kecerdasan buatan untuk menyokong pengalaman pembelajaran yang lebih diperibadikan.

.

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This study realizes that this report still has many shortcomings. Therefore, we eagerly anticipate constructive input and suggestions to enhance and develop the thesis. Finally, this thesis may be useful for readers and for developing science around the world.

Melaka, 12 May 2025

Izzatul Umami

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LIST OF ABBREVIATIONS

BPJPH	-	Halal Product Guarantee Agency
KTP	-	Identity Card
LP3H	-	Halal Product Process Companion Institution
M-FBS	-	Mobile Learning Food Business System
Me	-	Micro Enterprises
MPCU	-	Model of Personal Computer Utilization
NIB	-	Business Identification Number
NPWP	-	Taxpayer Identification Number
PU	-	Micro-enterprise
PAM	-	Principal Agent Model
SDLC	-	Development Software Cycle
SAC	-	Smart Apps Creator
SCT	-	Social Cognitive Theory
SPP-IRT	-	Fulfillment of Household Industry Food Production Commitments
SJPH	-	Halal Product Guarantee System
TAM	-	Technology Acceptance Model
TRA	-	Theory of Reasoned Action
TPB	-	Theory of Planned Behaviour
UCSD	-	User-centred System Design
UTAUT	-	Unified Theory of Acceptance and Use of Technology
UML	-	Unified Modeling Language

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LIST OF PUBLICATIONS

The following is a list of publications related to this thesis' work:

Umami, I., Che Pee, A. N. B., Bin Sulaiman, H. A., Hariyanto, & Mar'ati, F. S. (2024). A literature review of MSME success: Acceptance and use of technology, financial access, and strategic cooperation. Multidisciplinary Reviews, 6, 2023ss086. https://doi.org/10.31893/multirev.2023ss086

Umami, I., Naim, A., Asyrani, H., & Sri Mar'ati, F. (n.d.). Conceptual Model to Ensure Product Quality: Literature Study on Startup Micro-food Industry Business in Jombang. 13. https://resmilitaris.net/menu-script/index.php/resmilitaris/article/view/1645/1402

Umami, I., Bin, A. N., Pee, C., Asyrani, H., Sulaiman, B., & Khaerudin, A. (2023). Designing a Mobile Application to Assist micro-enterprises in Understanding the Food Business Legality Process. Register: Jurnal Ilmiah Teknologi Sistem Informasi, 9(1), 68–85. https://doi.org/10.26594/REGISTER.V9I1.3061

CHAPTER 1

INTRODUCTION

1.1 Background

The acceleration of digital technology has changed behavior in various aspects of life, both in the business world and in micro-enterprises. This change requires micro-enterprise actors to continue to adapt and compete in technological advances. Digital technology is believed to be able to simplify business operations and open access to broader and more efficient educational resources for business sustainability (Papadopoulos et al., 2020; Wan et al., 2020; Xie et al., 2022). Digital technology is also important in accelerating change and progress in the business and industrial sectors (Chatterjee & Kumar Kar, 2020). However, the adoption of technology in micro-enterprises is still relatively low. Although the government has provided various technology initiatives, micro-enterprise actors still face multiple obstacles in implementing digital technology in their operations (Handoko, 2019).

The 2030 Sustainable Development Agenda includes 17 Sustainable Development Goals (SDGs), emphasizing the importance of empowerment to overcome poverty through quality education to support entrepreneurial sustainability (Yáñez-Araque et al., 2021). Micro, Small, and Medium Enterprises (MSMEs) play an important role in Indonesia's economy, representing more than 99% of business units and contributing more than 60% to GDP while employing most of the workforce. Despite this significance, the digital transformation of micro-enterprises remains limited (Amankwah-Amoah et al., 2021; Joseph et al., 2021). Digital platforms—especially mobile learning (m-learning)—have the

potential to support increased knowledge, productivity, and competitiveness. Adopting mobile technology in the micro-enterprise sector is essential to accelerate digital transformation that can increase business competitiveness and sustainability. Technology can assist micro-enterprises in accessing information and training to improve managerial skills, product quality, and more efficient operations (Papadopoulos et al., 2020; Temouri et al., 2022). However, the adoption rate is low. According to data from the Indonesian Ministry of Cooperatives and SMEs, only around 6.45% of micro-enterprises have adopted information technology, including mobile-based applications for business support. In addition, they often face significant challenges, such as limited financial resources, market access, and adequate managerial knowledge (Aseto et al., 2022).

While Indonesia has initiated various policies to promote digital integration—such as the OSS (Online Single Submission) licensing system, halal certification digital platforms, and government electronic catalogs—many micro-entrepreneurs remain unfamiliar with these systems due to limited digital literacy. In addition, current training programs often lack personalization and fail to meet micro-entrepreneurs' daily practical operational needs. Evidence of various government policies integrated with digital technology is listed in Table 1.1.

Table 1.1 List of Licensing Institutions for micro-enterprise

No	Business Licensing Agency	Online Management
1	Halal	https://ptsp.halal.go.id/
2	Business licensing	https://oss.go.id/
3	E-Katalog	https://e-katalog.lkpp.go.id/
4	SS-PIRT	https://sppirt.pom.go.id/

In addition to the challenges of government policies for micro-enterprises to integrate with digital systems, there is another challenge that many micro-enterprise actors

face: product legality, especially in the food and beverage sector. To compete in the free market, micro-enterprises require product recognition and certification following applicable regulations. Figure 1.1 shows one of the sources of information about the halal certification registration process, which can only be accessed with a digital system in the form of a digital mobile or personal computer. However, this system will be easier to access using a mobile phone, as illustrated in Figure 1.1, which describes Indonesian Instagram accounts promoted during the 2022-2023 Sehati period. Figure 1.1 reflects the importance of micro-enterprise actors' understanding of product legality and readiness to face digitalization to increase consumer confidence and business sustainability.

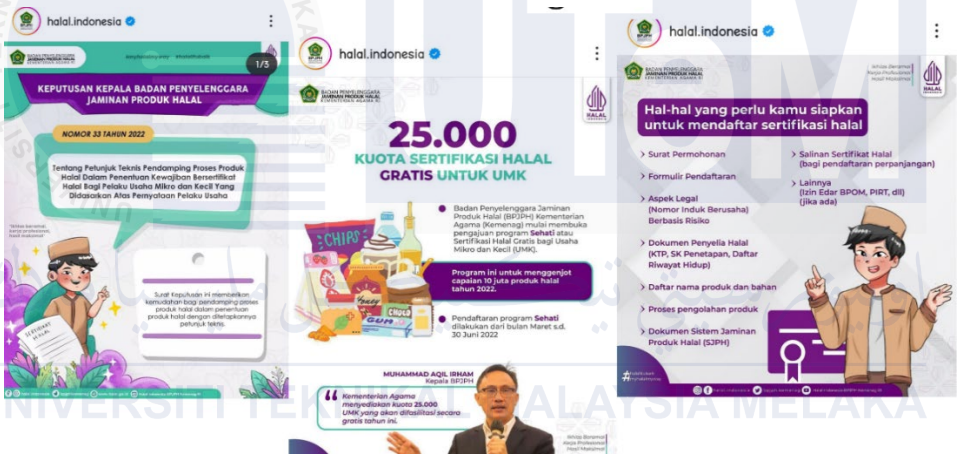

Figure 1.1 Source Instagram halal.Indonesia (sehati 2022-2023)

Adopting digital information technology and using digital systems, especially mobile-based systems, have become a problem for micro-enterprises. Micro enterprises face challenges such as low awareness of digital benefits, limited access to tailored training, and inadequate motivation or readiness to embrace new systems (Chatterjee & Kumar Kar, 2020). Mobile learning, as a flexible and low-cost approach to education, can be a strategic solution—but its implementation in the context of micro-enterprises is still underexplored. Therefore, digital technology can solve these challenges and accelerate micro-enterprises sustainability (Jafari-Sadeghi et al., 2021).

Digitalization through technologies such as the internet, mobile applications, e-learning platforms, WhatsApp, and Telegram provides various solutions for micro-enterprise actors to improve managerial, operational, and product quality skills and business performance and sustainability. However, the adoption and use of digital technology among micro-enterprises is still low. Although the government has provided various supporting technology initiatives, the adoption rate is still relatively low due to limited knowledge, distrust of new technologies, and implementation costs. Digitalization has great potential to support the sustainability of micro-enterprises, especially with Indonesia's potential as a country with a large population and a vast number of micro-enterprises, reaching 58.79 million in 2018 (Handoko et al., 2019). However, only 6.45% use digital technology to support their business activities. The primary concern of this study is to delve deeper into the factors that affect the adoption of technology by micro-enterprise actors in Indonesia.

While digital technologies can offer many solutions for micro-enterprises, their adoption and utilization are still limited. This research aims to explore the factors influencing the adoption and use of mobile technology by micro-entreprises and identify ways to improve their digital mobile technology readiness in the face of business challenges. Previous research has shown that the low rate of digital mobile technology adoption among micro-enterprises is due to a lack of knowledge and distrust of new technologies (Handoko et al., 2019; Vrontis et al., 2022).

In addition, the readiness, acceptance, and use of technology are important factors that need to be analyzed in the context of mobile technology adoption by micro-enterprises. This study focuses on developing a framework that can assist micro-entreprises