Determining Factors for the Success of Digital Financial Inclusion in Industrial Estates in Indonesia

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Article Info	ABSTRACT
	This study explores the determining factors for the success of digital financial inclusion in industrial estates in Indonesia, focusing on technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics. A quantitative approach was employed, using a sample of 86 respondents from various industrial estates across Indonesia. Data were collected through a structured survey with a Likert scale (1-5) and analyzed using SPSS version 25. The findings reveal that technological infrastructure, regulatory environment, and financial literacy are the strongest predictors of the success of digital financial inclusion, with socio-economic characteristics also playing a significant, though weaker, role. The regression model explained 69% of the variance in the success of digital financial inclusion. The study emphasizes the need for improved infrastructure, supportive government policies, and financial literacy programs to enhance the adoption and effectiveness of digital financial services. These findings provide valuable insights for policymakers, financial institutions, and business leaders seeking to foster greater financial inclusion in industrial estates.
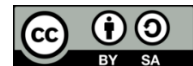
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1. INTRODUCTION

In recent years, digital financial inclusion has emerged as a critical factor for economic growth and development, particularly in developing countries such as Indonesia. Digital financial inclusion is a key driver of economic growth in developing countries like Indonesia, facilitating access to essential financial services for underserved communities. Supported by advancements in mobile technology, internet penetration, and digital literacy, fintech innovations such as digital payment platforms and peer-to-peer lending enhance transactional efficiency and financial access, though challenges like high interest rates and default risks remain [1]. The rise of e-commerce and internet usage further boosts GDP growth by enabling broader transactions [2]. Digital financial inclusion also strengthens MSME sustainability, aligning with government efforts to drive economic growth through technological innovation [3]. Digital payment platforms bridge the gap between the unbanked and formal financial services, fostering efficient transactions and economic participation [4]. Additionally, increasing digital literacy and social capital, particularly among Generation

Z, promote financial inclusion and the adoption of digital banking [5].

The Indonesian government's efforts to promote financial inclusion have made significant progress, yet challenges remain, particularly in industrial estates where SMEs struggle with digital financial service adoption due to infrastructure limitations, financial literacy gaps, and regulatory hurdles. Many industrial estates face inadequate digital infrastructure, limiting SMEs' ability to engage with digital platforms effectively, while economic digitalization and technology applications are crucial for financial management and business sustainability but are often hindered by compatibility issues and competitive pressures [6]. Additionally, a lack of financial literacy among SME owners and employees prevents them from fully utilizing digital tools, highlighting the need for enhanced digital literacy and financial education to improve financial inclusion [5]. Regulatory frameworks must also be more supportive of fintech innovations, as existing regulations may not fully address SMEs' unique needs in industrial estates, necessitating stronger collaboration between the government, fintech companies, and financial institutions to foster a conducive environment for digital financial service expansion [1], [7].

This study seeks to explore the determining factors for the success of digital financial inclusion in industrial estates in Indonesia. By identifying and analyzing these factors, the study aims to provide valuable insights into how digital financial services can be more effectively implemented in industrial estates, thus facilitating economic growth and enhancing financial accessibility for businesses operating within these areas. Given the importance of industrial estates as drivers of economic development, understanding the barriers and enablers of digital financial inclusion in these settings is crucial for policymakers, financial institutions, and businesses alike.

2. LITERATURE REVIEW

2.1 Digital Financial Inclusion: Concepts and Global Trends

Digital financial inclusion is crucial for economic development, especially in countries with large populations and limited banking infrastructure. Digital financial services, such as mobile money and banking, enhance financial access, efficiency, and cost-effectiveness for underserved populations. In Indonesia, initiatives like the National Financial Inclusion Strategy aim to expand access to formal financial services, though challenges persist in industrial estates due to infrastructure limitations, regulatory complexities, and financial illiteracy. Digital financial inclusion can boost income, particularly in rural areas, by promoting entrepreneurship and easing credit constraints [8]. Digital payment platforms help bridge the gap between the unbanked and formal financial services, improving financial literacy and economic participation [4]. Fintech innovations, including mobile money and peer-to-peer lending, have increased financial service accessibility in underserved regions. However, limited digital literacy, regulatory barriers, and infrastructure gaps hinder its full potential [4], [7]. The COVID-19 pandemic highlighted the necessity of digital transactions but also exposed cybersecurity risks and the need for stronger infrastructure. Moving forward, collaboration between governments, private sectors, and development organizations is essential to advancing financial inclusion [4]. Blockchain-based decentralized finance offers opportunities for lower-cost, faster transactions [7], while the post-pandemic era provides a chance to enhance digital financial resilience and accessibility.

2.2 Factors Influencing the Success of Digital Financial Inclusion

Digital financial inclusion relies on technological infrastructure and a supportive regulatory environment, both essential for expanding digital financial services in emerging markets and underserved regions. Mobile banking and digital payment platforms have significantly improved financial access, particularly in areas with limited traditional banking systems [9], [4].

However, poor connectivity and limited technology access remain barriers, especially in rural regions and industrial estates in Indonesia [10]. A favorable regulatory framework supporting digital identity, data protection, and fintech innovation is crucial, though stringent compliance requirements can hinder adoption [4]. Countries with strong fintech ecosystems show that supportive policies increase account ownership and financial service usage. Fintech solutions like mobile money and peer-to-peer lending reduce costs and enable faster transactions, improving financial access [7]. Additionally, digital financial literacy is vital for users to effectively adopt and manage digital financial tools [10].

2.3 Digital Financial Inclusion in Indonesia's Industrial Estates

Indonesia's drive for digital financial inclusion in industrial estates is crucial for optimizing the economic potential of SMEs and large businesses, yet challenges persist, including limited internet access, financial literacy gaps, and regulatory hurdles. Although internet penetration has reached 78.19%, industrial estates often lag in infrastructure development, restricting access to digital financial services [5]. A lack of financial literacy among business owners and employees further limits the effective use of digital tools [5], while regulatory complexities make adaptation to the digital financial ecosystem difficult [6]. Fintech solutions, such as digital payments and peer-to-peer lending, have improved financial access but also pose risks like high interest rates and potential defaults [1]. Islamic fintech, including crowdfunding and e-wakaf, has expanded funding alternatives for SMEs, strengthening financial inclusion within the Islamic financial system [11]. Advancing digital financial inclusion requires economic digitalization and technology adoption to enhance financial management and business sustainability [6]. Additionally, policies fostering digital literacy and ease of use are essential for broader adoption, particularly among younger generations inclined to embrace digital banking [5].

2.4 Research Gaps

While there is substantial literature on digital financial inclusion globally and in the context of developing economies, there remains a limited focus on the specific challenges and success factors for digital financial inclusion within industrial estates in Indonesia. This gap is particularly pronounced when considering SMEs operating within industrial estates, which are often seen as the backbone of Indonesia's manufacturing and industrial sectors. Therefore, further research is needed to understand the unique challenges faced by businesses in industrial estates and to identify the factors that contribute to the successful implementation of digital financial services in these settings.

2.5 Conceptual Framework

Based on the literature review, this study proposes a conceptual framework to investigate the key factors influencing the success of digital financial inclusion in Indonesia's industrial estates. The framework incorporates technological infrastructure, regulatory environment, financial literacy, and socio-economic factors as the primary variables that affect the adoption and effectiveness of digital financial services. By analyzing these factors, the study aims to provide a deeper understanding of how digital financial inclusion can be successfully promoted in Indonesia's industrial estates.

3. METHODS

3.1 Research Design

This study employs a quantitative research design with the aim of establishing the most important factors for the success of digital financial inclusion in Indonesia's industrial estates. Quantitative research enables the collection of numerical data, which can be processed in an orderly manner to establish patterns and correlations between variables. The research design takes a descriptive-correlational approach, as it tries to describe the character of the variables influencing digital financial inclusion and examine the correlation between them.

The underlying drivers analyzed in this study are technological infrastructure,

regulatory environment, financial knowledge, and socio-economic background. These are measured through questionnaires designed for the purpose and analyzed through statistical methods to determine their influence on digital financial inclusion success.

3.2 Population and Sample

The sample in this study is represented by companies that are active in industrial estates in Indonesia. The firms are a representative sample from different industries, such as manufacturing, services, and trade, and thus a heterogenous sample for the analysis of factors that determine digital financial inclusion. Industrial estates are selected due to the fact that they are centres of economic activities, where digital financial service adoption could greatly improve business efficiency, capital access, and economic growth.

The sample for the present study consists of 86 participants, namely business owners, managers, and decision-makers of these industrial estates. The sample size is determined on practical considerations, including resource availability and the need for sufficient statistical power to identify significant relationships. To ensure that the sample is representative of the industrial estates in Indonesia, a simple random sampling method is used to select participants. This is achieved through this methodology to ensure minimal bias and maximal generalizability of results to the population of industrial estates.

3.3 Data Collection

Data for the study are collected using a structured questionnaire to quantify the determinants of digital financial inclusion. The questionnaire is a series of closed-ended questions derived from the literature on digital financial inclusion. The questionnaire consists of four sections that correspond to one of the determinants: technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics.

The survey is done both online and offline to ensure that there is easy access to the target respondents, particularly those who are living within the industrial estates where the penetration of the internet may not be uniform. Data collection is carried out for four weeks. All the respondents must score the items on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) with the aim of capturing attitudes, perceptions, and experiences of adopting and achieving digital financial services.

3.4 Data Analysis

Information collected through survey responses are analyzed with SPSS version 25, which is a commonly used statistical software package for analyzing quantitative data in search of patterns, associations, and statistical correlation among variables. Summary statistics for the respondent demographic features like size of business, type of industry category, and digital financial services adoption levels are compiled using descriptive statistics, while central tendency (mean, median) and dispersion measures (standard deviation) provide a summary of data. In order to validate the internal consistency of the survey tool, Cronbach's alpha is calculated, which indicates a high internal consistency when the value is more than 0.70. Pearson correlation coefficients are computed in order to explore associations between significant factors—technological infrastructure, regulatory environment, financial literacy, and socio-economic features—helping to determine the strength and direction of association. Moreover, multiple regression analysis is conducted to analyze the impact of such independent variables on digital financial inclusion success in industrial estates and determine the most significant factors to adopt and use digital financial services.

4. RESULTS AND DISCUSSION

4.1 Demographic Sample Results

The demographic profile of the 86 respondents in this study consists of business owners, managers, and key decision-makers from various industrial estates across

Indonesia, providing insights into age, gender, education, industry sector, experience, firm size, and income level. The age distribution shows that the majority fall within the 30-39 age group (30.2%), followed by 40-49 years (25.6%), indicating a predominance of experienced professionals, while younger respondents (18-29 years) make up 20.9% of the sample. Gender distribution reveals a higher representation of males (68.6%) compared to females (31.4%), consistent with the leadership demographics in Indonesia's industrial sectors.

Educational background indicates that most respondents hold a Bachelor's Degree (57%), followed by Master's Degree holders (19.8%), with smaller proportions having an Associate Degree (16.3%) or a High School diploma (7%), suggesting a generally well-educated sample with a higher likelihood of digital financial service adoption. Industry sector distribution shows a dominance of the manufacturing sector (46.5%), followed by services (34.9%) and trade (18.6%), highlighting the relevance of digital financial inclusion in manufacturing. In terms of business experience, most respondents have 5-10 years (40.7%), followed

by 11-15 years (29.1%), reflecting a well-experienced sample familiar with business operations and financial decision-making. Firm size analysis indicates that 40.7% of businesses have 51-100 employees, while 23.3% operate with 1-50 employees, confirming that SMEs are key players in industrial estates. Income level distribution reveals that 34.9% of businesses earn IDR 1-5 billion annually, followed by 27.9% earning IDR 5-10 billion, showing a mix of small and larger enterprises. These characteristics collectively provide a comprehensive understanding of the respondent demographics, which are essential in analyzing perceptions and experiences related to digital financial inclusion.

The descriptive statistics for the sample of 86 respondents are summarized in Table 1, which presents the mean, standard deviation, minimum, and maximum values for the key variables: technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics. The respondents represent a range of industries within industrial estates, including manufacturing, services, and trade.

Table 1. Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Technological Infrastructure	3.85	0.95	2	5
Regulatory Environment	3.72	0.87	2	5
Financial Literacy	3.61	0.78	2	5
Socio-Economic Characteristics	3.93	0.91	2	5

The results indicate that, on average, respondents perceive the technological infrastructure and socio-economic characteristics within the industrial estates as being relatively favorable for digital financial inclusion, with means of 3.85 and 3.93, respectively. The regulatory environment and financial literacy have slightly lower means, at

3.72 and 3.61, indicating that while businesses generally see these factors as positive, there is room for improvement.

4.2 Reliability Analysis

The reliability of the survey instrument was assessed using Cronbach's alpha for each of the key factors. The results are presented in Table 2.

Table 2. Reliability Analysis

Variable	Cronbach's Alpha
Technological Infrastructure	0.851
Regulatory Environment	0.824
Financial Literacy	0.885
Socio-Economic Characteristics	0.878

All factors show acceptable to good internal consistency, with Cronbach's alpha values above the commonly accepted threshold of 0.70 (Nunnally, 1978). The highest value was observed for financial literacy (α = 0.885), followed by technological infrastructure (α = 0.851), indicating that the items within these constructs are particularly consistent. These results suggest that the survey instrument is reliable for measuring the constructs of interest.

4.3 Correlation Analysis

The Pearson correlation coefficients between the key factors are presented in Table 3. This analysis aims to assess the strength and direction of the relationships between technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics.

Table 3. Pearson Correlation Matrix

Variable	Technological Infrastructure	Regulatory Environment	Financial Literacy	Socio-Economic Characteristics
Technological Infrastructure	1.00			
Regulatory Environment	0.601**	1.00		
Financial Literacy	0.556**	0.636**	1.00	
Socio-Economic Characteristics	0.482**	0.583**	0.591**	1.00

The results show significant positive correlations between all the factors, with the highest correlation found between regulatory environment and financial literacy (r = 0.636), followed by technological infrastructure and regulatory environment (r = 0.601). This suggests that improvements in one factor tend to be associated with improvements in others. For example, better regulatory support might enhance financial literacy and enable the adoption of digital financial services.

4.4 Multiple Regression Analysis

To examine the impact of technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics on the success of digital financial inclusion, a multiple regression analysis was conducted. The success of digital financial inclusion was operationalized as a composite variable representing the perceived effectiveness of digital financial services in supporting business operations.

Table 4. Multiple Regression Analysis

Variable	Unstandardized Coefficients (B)	Standardized Coefficients (β)	t-value	p-value
Technological Infrastructure	0.231	0.322	3.587	0.001**
Regulatory Environment	0.211	0.281	3.202	0.002**
Financial Literacy	0.186	0.267	2.903	0.004**
Socio-Economic Characteristics	0.134	0.175	2.206	0.031*
R²		0.692		
F-Statistic		25.722		0.000**

The results of the regression analysis reveal that all four factors significantly influence the success of digital financial inclusion. Technological infrastructure (β = 0.322, p = 0.001), regulatory environment (β = 0.281, p = 0.002), and financial literacy (β = 0.267, p = 0.004) exhibit the strongest impacts, with standardized coefficients greater than

0.25. Socio-economic characteristics also have a significant impact, though their influence is somewhat weaker ($\beta = 0.175$, $p = 0.031$).

The R² value of 0.69 indicates that the independent variables explain 69% of the variance in the success of digital financial inclusion, which suggests a strong model fit. The F-statistic is highly significant (F = 25.72, $p = 0.000$), further confirming the robustness of the regression model.

4.5 Discussion

The findings of this study highlight the critical factors that contribute to the success of digital financial inclusion in industrial estates in Indonesia. The significant positive relationships between technological infrastructure, regulatory environment, financial literacy, and socio-economic characteristics underscore the complexity of promoting digital financial services in these settings.

The positive and significant relationship between technological infrastructure and the success of digital financial inclusion suggests that reliable internet connectivity and mobile network coverage are essential for businesses to fully engage with digital financial services. This finding aligns with previous studies that highlight the importance of technological infrastructure in enabling digital finance [12], [13].

The regulatory environment plays a pivotal role in the adoption of digital financial services. The significant effect of regulatory support suggests that government policies that encourage digital finance, along with legal protections for digital transactions, are crucial for fostering a conducive environment for digital financial inclusion. This finding supports research by [14], [15], which emphasizes the role of government regulations in facilitating digital finance adoption.

Financial literacy is another key determinant, with a strong positive effect. This finding highlights the importance of educating business owners and managers on how to use digital financial tools effectively, which aligns with the literature on financial inclusion [16], [17].

Socio-economic characteristics, such as business size and income level, have a moderate influence on the success of digital financial inclusion. While these factors are important, they are not as strong as the other variables, suggesting that socio-economic characteristics alone may not be sufficient to drive the success of digital financial inclusion without improvements in infrastructure, regulation, and financial literacy.

4.6 Implications for Policy and Practice

The findings of this study provide important insights for policymakers and business leaders seeking to promote digital financial inclusion in Indonesia. To improve the success of digital financial services in industrial estates, efforts should focus on enhancing technological infrastructure, providing supportive regulations, and improving financial literacy among business owners and managers. Additionally, socio-economic factors should be considered when designing programs to encourage digital finance adoption in industrial estates, particularly in ensuring that smaller businesses have access to the necessary resources.

5. CONCLUSION

In conclusion, the study highlights the key factors influencing the success of digital financial inclusion in industrial estates in Indonesia. The results indicate that technological infrastructure, regulatory environment, and financial literacy have a significant positive impact on the adoption and success of digital financial services. Socio-economic characteristics, while still important, exert a weaker influence in comparison to the other factors. These findings suggest that for digital financial inclusion to thrive in Indonesia's industrial estates, policymakers should focus on strengthening infrastructure, creating favorable regulatory frameworks, and promoting financial literacy among business owners and employees. By addressing these critical factors, Indonesia can accelerate the adoption of digital financial services, leading

to greater economic empowerment and
financial inclusion in the industrial sector.

REFERENCES

[1] Lakilaki, Eogenie & Syaqbania, Annisa & Amelia, Rizki & Putra, Septio & Muhamad, & Afriza, Nia. (2024). Can Financial Technology Drive Economic Growth in Indonesia?. EKOMA : Jurnal Ekonomi, Manajemen, Akuntansi. 4. 2628-2635. 10.56799/ekoma.v4i1.6201.

[2] Adya, T. V. (2024, November). IMPACT OF E-COMMERCE AND INTERNET USERS ON INDONESIA'S ECONOMIC GROWTH. In *International Conference of Business and Social Sciences* (pp. 317-327).

[3] Fitriyah, Lailatul & Purnomo, Arie & Nugroho, Prasetyo. (2024). Pengaruh Financial Literacy dan Digital Payment (QRIS) Terhadap Kinerja Berkelanjutan UMKM Madura. EKOMA : Jurnal Ekonomi, Manajemen, Akuntansi. 4. 2146-2164. 10.56799/ekoma.v4i1.5929.

[4] Alao, O., & Alonge, E. (2024). Advancing financial inclusion through digital payment platforms in emerging markets. *Financ. Account. Res. J*, *6*, 2028-2060.

[5] Annisa, Diah & Soma, A. & Sitorus, Palti. (2024). The Influence of Financial Literacy, Digital Literacy, and Social Capital on Digital Bank Financial Inclusion through Ease of Use an Intervening Variable. International Journal of Social Science and Human Research. 07. 10.47191/ijsshr/v7-i11-11.

[6] Suriani, S., Yunus, K., & Setiawan, L. (2024). Financial Management Based on Economic Digitalization and Information Technology Utilization Applications in Industry SMEs in Barru Regency, Indonesia. 2, 985–1013.

[7] Kudal, P., Dawar, S., Inamdar, V., Patnaik, A., & Rathore, T. (2024). Achieving Financial Inclusion through Blockchain-Based Decentralized Finance and the Fintech Revolution. In *Sustainability Reporting and Blockchain Technology* (pp. 364-375). Routledge.

[8] Mao, H. (2024). Digital Financial Inclusion and Inclusive Growth—Empirical evidence based on the China Household Panel Survey. *International Theory and Practice in Humanities and Social Sciences*, *1*(1), 36-53.

[9] Saeed, M. M., & Donkoh, E. (2024). Mobile banking services and financial inclusion among customers of commercial banks: Evidence from an emerging economy. *Business Strategy & Development*, *7*(4), e70035.

[10] Adhikari, M., Ghimire, D. M., & Lama, A. D. (2024). FinTech and Financial Inclusion: Exploring the Mediating Role of Digital Financial Literacy in Enhancing Access to Financial Services. *Journal of Emerging Management Studies*, *1*(2), 117-136.

[11] WAHYUDI, H., TUBARAT, C. P. T., RODLIYAH, N., KUSNADI, A., & LENY, S. M. (2025). The Nexus of Crowdfunding and e-Wakaf to Islamic Fintech in Indonesia in the Era of Industrial Revolution 5.0. *Journal of Ecohumanism*, *4*(1), 208-219.

[12] Wen, H., Zhong, Q., & Lee, C. C. (2022). Digitalization, competition strategy and corporate innovation: Evidence from Chinese manufacturing listed companies. *International Review of Financial Analysis*.

[13] Бородієнко, О., Зленко, А., Малихіна, Я., Кім, К., & ... (2022). Socio-economic prerequisites of strategic development of educational institutions. *Financial and Credit ….*

[14] Lafferty, C. (2019). Sustainable internet-of-things-based manufacturing systems: Industry 4.0 wireless networks, advanced digitalization, and big data-driven smart production. *Economics, Management, and Financial Markets*.

[15] Pardiman, P., Susyanti, J., Heriyawati, D. F., Zakaria, Z., & Masyhuri, M. (2022). Impact of financial capital, social capital, and business digitalization on business sustainability of SMEs in Indonesia. *Jurnal Manajemen Dan Pemasaran Jasa*, *15*(1), 69–82. https://doi.org/http://dx.doi.or g/10.25105/jmpj.v15i1.13114

[16] Denura, S. C., & Soekarno, S. (2023). A Study on Behavioural Bias & Investment Decision from Perspective of Indonesia's Cryptocurrency Investors. *International Journal of Current Science Research and Review*, *06*(01), 535–548. https://doi.org/10.47191/ijcsrr/v6-i1-58