FINANCE INNOVATIONS DIGEST
Volume 4, Issue 1, 2026| pp. 39-54
https://doi.org/10.63208/21013-214

E- ISSN: 3047-5538

Digital Quality and Financial Inclusion: The Moderating Role of Connectivity in BRImo

Diky Agietama[1*], Achmad Haris Fadhila[1], and Harjum Muharam[1]

Universitas Diponegoro, Semarang, Indonesia[1]

ABSTRACT

This study examines how digital quality influences financial inclusion among users of BRImo, a mobile banking application provided by Bank Rakyat Indonesia, with connectivity introduced as a moderating variable. The research is grounded in three theoretical pillars Technology Acceptance Model, Digital Financial Inclusion Theory, and Digital Divide Theory to explain how digital service performance and digital infrastructure interact in shaping financial inclusion outcomes in geographically constrained regions. Using a sample of 150 BRImo users living in coastal districts of Sumenep, this study employs Partial Least Squares. Structural Equation Modeling (PLS-SEM) for empirical analysis. The findings reveal that digital quality significantly enhances financial inclusion, while connectivity alone does not show a direct effect. However, connectivity significantly strengthens the relationship between digital quality and financial inclusion, demonstrating that the positive impact of well-designed digital services depends heavily on network stability. This study provides new insights into digital banking adoption in underserved coastal communities and highlights the crucial role of infrastructure readiness in maximizing the effectiveness of mobile financial services.

Keywords: *Connectivity, Digital Quality, Financial Inclusion, Mobile Banking.*

CORRESPONDING AUTHOR:
Diky Agietama
Universitas Diponegoro, Semarang, Indonesia
contact: *dagietama03@gmail.com*

ARTICLE HISTORY
Received : May 30, 2025
Final Revised : September 16, 2025
Accepted : January 5, 2026
Published : January 24, 2026

© 2026 The Author(s) | This article is an open access article and distributed under the terms and conditions of the Creative Commons Attribution (CC BY-SA) license.

1. | INTRODUCTION

Digital transformation in the financial sector has become one of the most significant structural shifts in the global economy. Advances in information technology have encouraged banks to migrate a substantial portion of their services to digital platforms, particularly through mobile banking (Kitsios et al., 2021). In Indonesia, the digitalization of the banking industry has accelerated rapidly in line with increasing internet penetration and widespread smartphone adoption (Erlando et al., 2020). Bank Rakyat Indonesia (BRI), the institution with the widest outreach nationwide, continues to strengthen its digital transformation agenda through the BRImo application. This platform has recorded the fastest-growing user base in the country, reaching 31.6 million users in 2023, rising to 35.2 million by mid-2024, and ultimately hitting 44.4 million users in 2025, with daily transaction values exceeding IDR 25 trillion. These figures confirm that mobile banking has become an essential instrument in modern financial activities (Vu & Asongu, 2023).

However, national-level success does not fully reflect the conditions in geographically challenging areas, particularly coastal and island regions. Sumenep Regency, which consists of vast coastal zones and numerous small islands, faces significant challenges in utilizing digital financial services. Limitations in connectivity, fluctuating network quality, and uneven telecommunication infrastructure contribute to suboptimal access to BRImo compared to mainland areas (Jaya et al., 2024). Demographically, coastal communities in Sumenep have high transactional needs, including microbusiness operations, interregional remittances, and payments for daily necessities. When connectivity weakens, BRImo becomes difficult to use: login attempts fail, transactions are delayed, and notifications do not appear. This phenomenon demonstrates that digital service quality cannot produce optimal outcomes without adequate network infrastructure (Tay et al., 2022).

Despite continuous improvements in digital quality such as enhanced system stability, transaction security, and user-friendly navigation network conditions remain the primary barrier. This argument aligns with Digital Divide Theory, which asserts that digital disparities are not only caused by differences in device ownership but also by unequal access to reliable internet infrastructure (Aziz & Naima, 2021). In the case of Sumenep, BRImo users fall within the access divide, where the ability to fully utilize digital services is heavily influenced by network strength. Research by Mothobi and Kebotsamang (2024) also shows that robust network coverage significantly increases the adoption of digital financial services and financial inclusion. Without adequate connectivity, improvements in digital quality will not translate effectively into increased financial inclusion. Thus, connectivity serves as a critical factor that can either reinforce or even determine the extent to which digital quality drives financial inclusion (Aziz & Naima, 2021; Tay et al., 2022).

From a user behavior perspective, digital quality is a key determinant shaping perceived usefulness and perceived ease of usethe two core constructs of the

Technology Acceptance Model (TAM) (Venkatesh & Bala, 2008). Navigation quality, responsiveness, and application reliability directly influence user experience. Previous studies show that application quality significantly enhances trust, satisfaction, and usage intensity in mobile banking (Apriandika & Shiratina, 2024; Sharma & Sharma 2019). However, the contribution of digital quality to financial inclusion has not been empirically tested extensively, especially within coastal communities.

In fact, digital financial inclusion plays a crucial role in improving economic welfare, particularly in areas with limited access to physical banking facilities. Digital Financial Inclusion Theory emphasizes that digital platforms have the potential to expand financial access to previously underserved populations (Gallego-Losada et al., 2023; Ozili, 2024). Through mobile banking, coastal residents can perform payments, save money, and conduct transactions without visiting bank branches. However, the effectiveness of these services depends heavily on application quality and connectivity.

To date, research on mobile banking in Indonesia has predominantly examined usage intention, perceived usefulness, or user satisfaction. Studies that investigate how digital quality contributes to financial inclusion are still limited, especially those incorporating connectivity as a moderating variable. Moreover, research focusing specifically on BRImo within island or coastal settings is nearly non-existent indicating a substantial research gap.

In response, this study proposes several contributions. First, it examines the influence of Digital Quality on Financial Inclusion within coastal communities, a context often overlooked in digital finance research. Second, it introduces Connectivity as a moderating variable to explain disparities in BRImo effectiveness across regions with differing network conditions. Third, it integrates three major theoretical perspectives TAM, Digital Financial Inclusion Theory, and Digital Divide Theory into a comprehensive analytical framework. Accordingly, this study provides substantive contributions to the literature on mobile banking in remote regions and offers new insights for policy development on digital financial services in coastal areas.

2. | LITERATURE REVIEW

Grand Theory

The Technology Acceptance Model (TAM) provides the foundational framework for explaining how users accept and utilize technology. Its two core constructs perceived usefulness and perceived ease of use are directly influenced by the digital quality of an application, including navigation simplicity, system stability, and response speed (Venkatesh & Bala, 2008). Therefore, the digital quality of BRImo plays a vital role in determining the readiness of coastal communities to adopt digital financial services. The Digital Financial Inclusion Theory highlights that digital technologies can enhance access to and usage of financial services among traditionally underserved groups (Gallego-Losada et al., 2023; Ozili, 2024). Mobile banking is a key instrument for expanding financial inclusion in remote areas because it helps overcome physical and cost-related barriers associated with traditional banking. The Digital Divide Theory

explains that disparities in the use of technology arise due to differences in infrastructure, digital literacy, and connectivity (van Dijk, 2006). In the context of coastal Sumenep, unstable network signals remain a major barrier to accessing and utilizing BRImo, making connectivity highly relevant as a moderating variable.

Digital Quality

Digital quality includes system reliability, ease of use, service speed, data security, and application stability factors that significantly shape user perceptions and experiences with digital applications, including mobile banking (Kim & Yang, 2025). Previous research shows that high digital quality enhances user satisfaction, trust, and loyalty, and increases the intensity of digital service usage (Vatolkina et al., 2020). Furthermore, perceptions of digital quality are also influenced by emotional factors such as visual aesthetics and interactive experience, which enhance the attractiveness and perceived trustworthiness of the application (Bhandari et al., 2019).

H1: Digital Quality has a positive and significant effect on Financial Inclusion among BRImo users in the coastal areas of Sumenep Regency.

Connectivity

Connectivity is a fundamental prerequisite for digital access. Connectivity quality such as signal stability and network speed determines user's ability to access digital applications (Riddlesden & Singleton, 2014). Studies emphasize that robust connectivity infrastructure is essential for digital transformation and the development of a digital ecosystem, particularly in remote or coastal regions that often face infrastructure limitations (Lynn et al., 2022; Salemink et al., 2017). Poor connectivity can lead to delays, failures, or even the impossibility of conducting digital transactions, negatively affecting user perceptions and experiences.

H2: Connectivity does not have a direct effect on Financial Inclusion among BRImo users.

Financial Inclusion

According to Akter et al. (2021) and Ingale (2025) mobile banking significantly enhances financial inclusion in developing countries by overcoming geographic constraints, infrastructure limitations, and high transaction costs. These services allow individuals in remote areas including coastal communities in Indonesia to access formal financial services without relying on physical bank branches (Sukumaran, 2025). However, financial inclusion levels are heavily influenced by the quality of mobile banking applications and user's ability to consistently access and operate them (Muchandigona & Kalema, 2023). Factors such as system reliability, ease of use, security, and digital literacy determine the success of mobile banking in expanding financial inclusion (Siano et al., 2020; Sirakaya & Erturk, 2025).

H3: Connectivity strengthens the relationship between Digital Quality and Financial Inclusion.

Relationship Between Variables

Prior studies demonstrate that high digital quality indeed increases the use of mobile banking services and contributes to improved financial inclusion by expanding access and deepening the utilization of digital financial services (Xi & Wang 2023). However, a major challenge in many developing countries is the digital infrastructure gap, particularly in terms of connectivity quality, which may either amplify or weaken the positive effect of digital quality on financial inclusion (Aziz & Naima, 2021; Tay et al., 2022). In regions with strong infrastructure and stable signals, digital applications such as BRImo can be utilized optimally to drive financial inclusion. Conversely, in coastal or remote areas with weak network coverage, connectivity constraints become a primary barrier, preventing digital quality from generating its maximum impact on financial inclusion. This interaction suggests that connectivity plays a decisive moderating role in determining how effectively digital quality translates into increased financial inclusion.

3. | RESEARCH METHOD

The target population of this study consists of active BRImo users residing in the coastal areas of Sumenep Regency, including Dungkek, Batang-Batang, Ambunten, Gapura, and the Kangean Islands. These regions were selected due to their unstable connectivity characteristics, which align with the research objective focusing on the role of digital infrastructure. The unit of analysis is individual BRImo users. A purposive sampling technique was employed with the following criteria: 1) active BRImo users for at least six months; 2) domiciled in coastal areas; and 3) having conducted digital transactions through BRImo within the past three months. The minimum sample size was determined using Hair's rule of thumb (number of indicators × 5). With 15 indicators, the minimum required sample was 75 respondents. To enhance the stability and statistical power of PLS-SEM estimation, the actual sample size was increased to 150 respondents (Hair et al. 2021). The profile of respondents collected includes age, occupation, BRImo usage frequency, and type of connectivity used (mobile data, home WiFi, or public hotspot).

Data were collected using both online and offline approaches. The questionnaire consisted of two main sections covering demographic and profile information as well as research variable statements measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This mixed approach ensured adequate coverage of coastal respondents who may have varying access to digital survey tools.

All constructs were measured reflectively. Indicators were adapted from international literature and contextualized to BRImo usage in coastal regions. Table 1 presents the operational definitions of the variables.

Table 1. Operationalization of Research Variables

Variable	Indicator	Code	Source
Digital Quality	System reliability	DQ_1	

	Response speed	DQ_2	Kim and Yang (2025); Vatolkina et al. (2020)
	Navigation ease	DQ_3	
	Data security	DQ_4	
	Application stability	DQ_5	
Connectivity	Signal stability	CN_1	Lynn et al. (2022); Salemink et al. (2017)
	Network availability	CN_2	
	Connection speed	CN_3	
	Access consistency	CN_4	
Financial Inclusion	Access to digital financial services	FI_1	Siano et al. (2020); Sirakaya & Erturk (2025)
	Usage frequency	FI_2	
	Diversity of services used	FI_3	
	Transaction convenience	FI_4	
	Perceived digital benefits	FI_5	
	Usage efficiency	FI_6	

Data were analyzed using SmartPLS 4.0 with the PLS-SEM approach, which is appropriate for predictive modeling, medium-sized samples (150 respondents), and non-normal data distributions (Hair et al., 2021). The analysis procedures consisted of measurement model evaluation (outer model) convergent validity (loading ≥ 0,70; AVE ≥ 0,50), discriminant validity (HTMT < 0,85), reliability (Cronbach's Alpha dan Composite Reliability ≥ 0,70). Structural model evaluation (inner model) coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and Significance testing using bootstrapping with 5,000 subsamples (t > 1,96; p < 0,05). Connectivity moderation was tested using an interaction term to determine whether network quality strengthens or weakens the effect of digital quality on financial inclusion. Model fit was assessed using SRMR and NFI as recommended for PLS-SEM models.

4. | RESULTS

Respondent Demographics

The demographic distribution of respondents is presented in Table 2. All respondents were active BRImo users residing in coastal areas of Sumenep Regency.

Table 2. Respondent Demographic Distribution

Item	Count	Percentage
Coastal Districts		
Dungkek	32	21.3%
Batang-Batang	28	18.7%
Ambunten	26	17.3%
Gapura	22	14.7%
Batuputih	19	12.7%
Kepulauan Kangean	23	15.3%
Age		
< 25 years	22	14.7%

2535 years	48	32.0%
3645 years	43	28.7%
> 45 years	37	24.6%
Gender		
Man	86	57.3%
Woman	64	42.7%
Occupation		
Fisherman	41	27.3%
Trader	36	24.0%
Farmer/Livestock	19	12.7%
Civil Servant/Employee	17	11.3%
Entrepreneur	24	16.0%
Others	13	8.7%
Duration of BRImo Usage		
< 6 months	11	7.3%
612 months	28	18.7%
12 years	56	37.3%
> 2 years	55	36.7%
Type of Internet Access		
Mobile Data (4G)	98	65.3%
Home WiFi	19	12.7%
Public Hotspot	33	22.0%
Total	150	100%

A total of 150 respondents were drawn from six major coastal regions in Sumenep Dungkek, Batang-Batang, Ambunten, Gapura, Batuputih, and the Kangean Islands. These areas were chosen due to their uneven connectivity conditions, making them relevant locations for analyzing how connectivity influences BRImo usage. The majority of respondents were within the productive age range of 25-45 years (60.7%). Male respondents accounted for 57.3%, reflecting the socioeconomic characteristics of coastal communities where fishing and trading are dominant activities.

Fishermen (27.3%) and traders (24%) represented the largest occupational groups. In terms of digital experience, most respondents had used BRImo for 1-2 years (37.3%), followed closely by users with more than two years of experience (36.7%), indicating a relatively mature level of mobile banking adoption in coastal areas. Internet access was predominantly mobile data (65.3%), highlighting residents' reliance on mobile networks due to limited WiFi infrastructure in coastal and island regions. These findings underscore the importance of examining digital quality and connectivity as key determinants influencing digital financial service adoption in geographically remote environments.

Measurement Model (Outer Model)

The measurement model evaluation was conducted to ensure that each indicator reliably reflects its latent construct. The assessment included outer loadings, Cronbachs

Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Table 3 summarizes the results.

Table 3. Outer Loadings, Cronbachs Alpha, Composite Reliability, and AVE

Construct	Indicator	Item	Outer Loading	Cronbachs Alpha	(CR)	(AVE)
Digital Quality	System reliability	DQ_1	0.959	0.979	0.984	0.905
	Response speed	DQ_2	0.967			
	Navigation ease	DQ_3	0.957			
	Data security	DQ_4	0.966			
	Application stability	DQ_5	0.956			
Connectivity	Signal stability	CN_1	0.949	0.970	0.974	0.924
	Network availability	CN_2	0.931			
	Connection speed	CN_3	0.989			
	Access consistency	CN_4	0.936			
Financial Inclusion	Access to digital services	FI_1	0.940	0.975	0.979	0.887
	Usage frequency	FI_2	0.942			
	Variety of services used	FI_3	0.945			
	Transaction convenience	FI_4	0.951			
	Perceived benefits	FI_5	0.939			
	Usage efficiency	FI_6	0.935			

All indicators exceeded the recommended outer loading threshold of 0.70, ranging from 0.931 to 0.989, demonstrating exceptionally strong indicator reliability. Cronbachs Alpha and Composite Reliability values ranged from 0.970 to 0.984, indicating excellent internal consistency across constructs. AVE values ranged from 0.887 to 0.924, demonstrating that each construct explains more than 88% of the variance in its indicators. These findings confirm that the measurement model meets all criteria for convergent validity and reliability, allowing the analysis to proceed to the structural model.

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) to ensure that the constructs in the model are conceptually distinct. Values below 0.85 indicate adequate discriminant validity. Table 4 presents the results.

Table 4. HTMT Discriminant Validity Results

Construct	Connectivity	Digital Quality	Financial Inclusion
Connectivity	–	–	–
Digital Quality	0.069	–	–
Financial Inclusion	0.058	0.771	–

All HTMT values were below the maximum threshold of 0.85. The HTMT between Digital Quality and Connectivity was 0.069, between Financial Inclusion and Connectivity was 0.058, and between Digital Quality and Financial Inclusion was 0.771. Although the latter is relatively higher than the others, it remains well within the

acceptable range, indicating that all constructs are empirically distinct and free from conceptual overlap. Thus, discriminant validity is fully satisfied.

Structural Model (Inner Model)

The structural model analysis was conducted to evaluate the strength of the relationships among latent variables and the predictive capability of the overall model. The assessment included examining path coefficients, the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). Statistical significance was evaluated using a bootstrapping procedure with 5,000 subsamples.

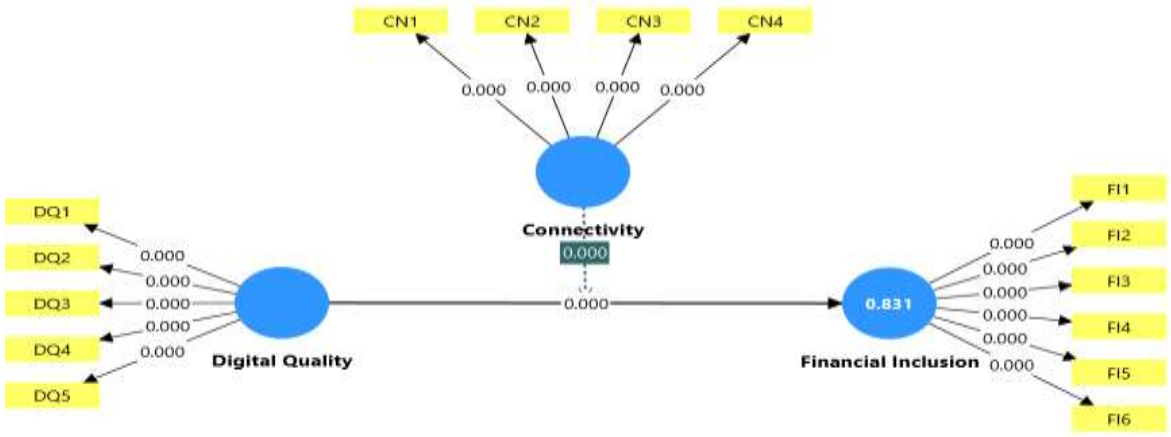

Figure 1. Path Coefficient

The results of the estimated path coefficients, including t-statistics and p-values, are presented in Table 5.

Table 5. Path Coefficients and Significance

Relationship	Coefficient	t-statistic	p-value	Description
Digital Quality→Financial Inclusion	0.573	21.932	0.000	Significant
Connectivity → Financial Inclusion	-0.039	-1.293	0.198	Not significant
Digital Quality × Connectivity → Financial Inclusion	0.460	15.994	0.000	Significant

The results show that Digital Quality has a strong and significant positive effect on Financial Inclusion, with a path coefficient of 0.573 and a t-statistic of 21.932 ($p < 0.001$). This indicates that the quality of BRImos digital features plays a crucial role in enhancing the financial inclusion of coastal communities. In contrast, Connectivity does not exert a direct significant effect on Financial Inclusion, as reflected by its coefficient of −0.039 and p-value of 0.198. However, the interaction term between Digital Quality and Connectivity demonstrates a highly significant moderating effect on Financial Inclusion, with a path coefficient of 0.460 and a t-statistic of 15.994. This

suggests that connectivity acts as a strengthening factor, wherein the influence of digital quality on financial inclusion becomes substantially greater under conditions of stable and reliable network connectivity.

The R^2 value indicates the extent to which the independent variables explain the variance in the dependent variable.

Table 6. R-Square Values

Construct	R^2	Category
Financial Inclusion	0.843	Strong

The R^2 value of 0.843 signifies that 84.3% of the variance in Financial Inclusion is explained by Digital Quality, Connectivity, and their interaction. This value falls within the category of very strong predictive accuracy, demonstrating that the model has excellent explanatory power in understanding the determinants of digital financial inclusion among coastal BRImo users. These results underscore that the combination of digital quality and network conditions is essential for predicting successful adoption of digital financial services in remote regions.

Effect size (f^2) was used to determine the magnitude of each predictor variable's contribution to the model.

Table 7. Effect Size (f^2)

Connection	f^2	Category
Digital Quality → FI	3.295	Very Large
Connectivity → FI	0.011	Small
Digital Quality × Connectivity → FI	1.752	Very Large

The results indicate that Digital Quality exhibits a very large effect on Financial Inclusion, with an f^2 value of 3.295, confirming that digital service quality is the strongest determinant of financial inclusion among BRImo users. Meanwhile, Connectivity shows a negligible direct effect (0.011), reinforcing earlier findings that connectivity alone does not directly shape financial inclusion. However, the interaction between Digital Quality and Connectivity yields an f^2 value of 1.752, categorized as very large. This finding confirms that connectivity serves as a powerful moderating variable that amplifies the impact of digital quality on financial inclusion. In practical terms, the benefits of high-quality digital services can be fully realized only when supported by stable and adequate network connectivity.

Table 8. Q-Square Value

Construct	Q^2
Financial Inclusion	0.612

The Q^2 value of 0.612 indicates that the model possesses strong predictive relevance. A Q^2 value exceeding 0.35 is considered highly satisfactory, suggesting that the model not only explains the empirical relationships among variables but also has strong predictive capability when applied to similar populations. This means that the findings are robust and likely to remain stable when generalizing to other coastal BRImo users in Sumenep.

Table 9. Goodness of Fit (SRMR and NFI)

Size	Values	Criteria
SRMR	0.041	< 0.08 (good)
NFI	0.923	> 0.90 (good fit)

The goodness-of-fit indicators confirm that the structural model performs well. The SRMR value of 0.041 is within the acceptable threshold, indicating minimal residual differences between the observed and predicted covariance matrices. Additionally, the NFI value of 0.923 surpasses the minimum standard of 0.90, demonstrating excellent model fit. Collectively, these indices validate that the structural model aligns closely with the empirical data and is suitable for further interpretation and theoretical synthesis.

5. | DISCUSSION

Digital Quality

The findings demonstrate that Digital Quality exerts the most dominant influence on Financial Inclusion. The digital attributes of BRImo namely system reliability, response speed, data security, and application stability significantly enhance the financial inclusion of coastal communities, where infrastructural limitations remain persistent. Improved digital service quality has been shown to strengthen engagement with digital financial platforms, expand access to formal financial services, and increase user trust in digital banking (Aziz & Naima, 2021; Tay et al., 2022). This is in line with the technology acceptance model (Technology Acceptance Model), These findings are in line with the Technology Acceptance Model, which asserts that perceived usefulness and perceived ease of use are critical determinants of digital technology adoption. Consequently, enhancing digital quality should be complemented by user education initiatives and infrastructure development to ensure that financial inclusion can be achieved in an equitable and sustainable manner across coastal communities.

Connectivity

The results reveal that Connectivity does not directly influence Financial Inclusion, yet it serves as a powerful moderating variable that determines the effectiveness of digital financial services. Network quality and stability are crucial, particularly in coastal or rural areas where signal variability and limited telecommunications infrastructure are common challenges (Mothobi & Kebotsamang, 2024). Consistent with Digital Divide Theory (van Dijk, 2006), mere access to technology is insufficient;

the quality of connectivity dictates the extent to which communities can fully utilize digital platforms. Poor connectivity can result in delays, transaction failures, or an inability to complete digital processes, thereby negatively affecting user experience and diminishing confidence in mobile banking services. This study reinforces the argument that connectivity is a determining factor in whether digital financial innovations can deliver their intended benefits to underserved populations.

Financial Inclusion

Financial Inclusion is a multidimensional outcome shaped by the intersection of digital application quality and infrastructural readiness, particularly network conditions. The findings indicate that although digital quality and digital literacy are essential for fostering the adoption of mobile financial services, the success of digital financial inclusion is strongly influenced by the presence of adequate technological and communication infrastructure. The significant moderating effect identified in this study suggests that high digital quality alone is not sufficient; without stable connectivity, its impact remains limited, especially in coastal or infrastructure-constrained regions (Rahayu et al., 2023). This study therefore broadens the existing digital financial inclusion literature by emphasizing the geographical nuances of coastal regions contexts that have historically received limited attention in Indonesian digital finance studies (Triwibowo & Nurbasith, 2023). The findings highlight the need to consider geographical disparities when developing digital financial policies for remote areas.

6. | CONCLUSION

This study concludes that Digital Quality is the most influential factor affecting Financial Inclusion among BRImo users in the coastal districts of Sumenep Regency. Although Connectivity does not directly affect financial inclusion, it plays a crucial role as a moderator, strengthening the relationship between digital quality and financial inclusion. The research model demonstrates exceptionally high predictive power, indicating that both the quality of digital applications and the condition of network infrastructure significantly shape the ability of coastal communities to utilize digital financial services effectively. The findings underscore the importance of integrating enhancements in BRImo's digital service quality with strategic improvements in digital infrastructure across coastal regions to achieve more equitable and sustainable financial inclusion. This study is expected to provide valuable insights for financial institutions, local governments, and network providers in formulating policies that are more responsive to the geographic and socio-economic characteristics of coastal populations.

Acknowledgement

The researcher extends sincere appreciation to the coastal communities of Sumenep Regency who participated in the data collection process. Gratitude is also conveyed to the supporting banking institutions and local village authorities for their assistance throughout the research activities. Special thanks are given to the reviewers and academic peers whose constructive feedback contributed to the refinement of this article.

Funding Information

This research did not receive any funding.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Ethical Approval and Originality Statement

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

Akter, U., Anwar, S. R., Mustafa, R., Ali, Z., & Cumilla, B. (2021). Revisiting the impact of mobile banking in financial inclusion among the developing countries. *International Journal of Financial Research*, *12*(2), 62-74. https://doi.org/10.5430/ijfr.v12n2p62

Apriandika, P., & Shiratina, A. (2024). The Influence of Service Quality, Ease of Use, and Trust on User Satisfaction of BNI Mobile Banking. *Jurnal Manajemen Sinergi*, *12*(2), 18-36. https://doi.org/10.33387/jms.v12i2.8846

Aziz, A., & Naima, U. (2021). Rethinking digital financial inclusion: Evidence from Bangladesh. *Technology in society*, *64*, 101509. https://doi.org/10.1016/j.techsoc.2020.101509

Bhandari, U., Chang, K., & Neben, T. (2019). Understanding the impact of perceived visual aesthetics on user evaluations: An emotional perspective. *Information & management*, *56*(1), 85-93. https://doi.org/10.1016/j.im.2018.07.003

Erlando, A., Riyanto, F. D., & Masakazu, S. (2020). Financial inclusion, economic growth, and poverty alleviation: Evidence from eastern Indonesia. *Heliyon*, *6*(10). https://doi.org/10.1016/j.heliyon.2020.e05235

Gallego-Losada, M. J., Montero-Navarro, A., García-Abajo, E., & Gallego-Losada, R. (2023). Digital financial inclusion. Visualizing the academic literature. *Research in International Business and Finance*, *64*, 101862. https://doi.org/10.1016/j.ribaf.2022.101862

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook* (p. 197). Springer Nature. https://doi.org/10.1007/978-3-030-80519-7

Ingale, A. (2024). Financial inclusion through mobile banking in emerging economies. *Available at SSRN 5060697*. https://doi.org/10.2139/ssrn.5060697

Jaya, I. G. N. M., Pahlevi, S. M., Susenna, A., Agustina, L., Kusumasari, D., Sukma, Y. A. A., Hernikawati, D., Rahmi, A. A., Pravitasari, A. A., & Kristiani, F. (2024). Framework for monitoring the spatiotemporal distribution and clustering of the digital society index of Indonesia. *Sustainability*, *16*(24), 11258. https://doi.org/10.3390/su162411258

Kim, S. H., & Yang, Y. R. (2025). The effect of digital quality on customer satisfaction and brand loyalty under environmental uncertainty: Evidence from the banking industry. *Sustainability*, *17*(8), 3500. https://doi.org/10.3390/su17083500

Kitsios, F., Giatsidis, I., & Kamariotou, M. (2021). Digital transformation and strategy in the banking sector: Evaluating the acceptance rate of e-services. *Journal of Open Innovation: technology, market, and complexity*, *7*(3), 204. https://doi.org/10.3390/joitmc7030204

Rahayu, S. K., Budiarti, I., Firdauas, D. W., & Onegina, V. (2023). Digitalization and informal MSME: Digital financial inclusion for MSME development in the formal economy. *Journal of Eastern European and Central Asian Research (JEECAR)*, *10*(1), 9-19. https://doi.org/10.15549/jeecar.v10i1.1056

Lynn, T., Rosati, P., Conway, E., Curran, D., Fox, G., & O'Gorman, C. (2022). Infrastructure for digital connectivity. In *Digital towns: Accelerating and measuring the digital transformation of rural societies and economies* (pp. 109-132). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-91247-5_6

Mothobi, O., & Kebotsamang, K. (2024). The impact of network coverage on adoption of Fintech and financial inclusion in sub-Saharan Africa. *Journal of Economic Structures*, *13*(1), 5. https://doi.org/10.1186/s40008-023-00326-7

Muchandigona, A. K., & Kalema, B. M. (2023). The catalytic role of mobile banking to improve financial inclusion in developing countries. *International Journal of E-Services and Mobile Applications (IJESMA)*, *15*(1), 1-21. https://doi.org/10.4018/ijesma.317923

Ozili, P. K. (2024). Digital agency theory of financial inclusion. In *Developing Digital Inclusion Through Globalization and Digitalization* (pp. 55-72). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-4111-7.ch004

Riddlesden, D., & Singleton, A. D. (2014). Broadband speed equity: A new digital divide?. *Applied Geography*, *52*, 25-33. https://doi.org/10.1016/j.apgeog.2014.04.008

Salemink, K., Strijker, D., & Bosworth, G. (2017). Rural development in the digital age: A systematic literature review on unequal ICT availability, adoption, and use in rural areas. *Journal of rural studies*, *54*, 360-371. https://doi.org/10.1016/j.jrurstud.2015.09.001

Sharma, S. K., & Sharma, M. (2019). Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. *International journal of information management*, *44*, 65-75. https://doi.org/10.1016/j.ijinfomgt.2018.09.013

Siano, A., Raimi, L., Palazzo, M., & Panait, M. C. (2020). Mobile banking: An innovative solution for increasing financial inclusion in Sub-Saharan African Countries: Evidence from Nigeria. *Sustainability*, *12*(23), 10130. https://doi.org/10.3390/su122310130

Sirakaya, Y., & Erturk, R. (2025). Digitalization and Financial Inclusion: New Opportunities and Challenges in Developing Countries. https://doi.org/10.58806/ijsshmr. Available on https://www.researchgate.net/publication/396529128_Digitalization_and_Financial_Inclusion_New_Opportunities_and_Challenges_in_Developing_Countries. Accessed 2026-09-22T08:53:01.529Z.

Sukumaran, S. (2025). Mobile banking and financial inclusion: Bridging gaps globally. *European Journal of Computer Science and Information Technology*, *13*(19), 1-12. https://doi.org/10.37745/ejcsit.2013/vol13n19112

Tay, L. Y., Tai, H. T., & Tan, G. S. (2022). Digital financial inclusion: A gateway to sustainable development. *Heliyon*, *8*(6). https://doi.org/10.1016/j.heliyon.2022.e09766

Triwibowo, S., & Nurbasith, N. (2022, December). Measuring financial inclusion in Indonesia: Asserting the role of digital financial services. In *Asia-Pacific Conference on Economics & Finance* (pp. 119-140). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-1979-6_8

Van Dijk, J. A. (2006). Digital divide research, achievements and shortcomings. *Poetics*, *34*(4-5), 221-235. https://doi.org/10.1016/j.poetic.2006.05.004

Vatolkina, N., Gorbashko, E., Kamynina, N., & Fedotkina, O. (2020). E-service quality from attributes to outcomes: The similarity and difference between digital and hybrid services. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 143. https://doi.org/10.3390/joitmc6040143

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision sciences*, *39*(2), 273-315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Vu, K., & Asongu, S. (2023). Patterns and drivers of financial sector growth in the digital age: Insights from a study of industrialized economies. *Research in International Business and Finance*, *66*, 102075. https://doi.org/10.1016/j.ribaf.2023.102075

Xi, W., & Wang, Y. (2023). Digital financial inclusion and quality of economic growth. *Heliyon*, *9*(9). https://doi.org/10.1016/j.heliyon.2023.e19731