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## Bridging the Digital Divide: Empowering Coastal Women through Public Sector Innovation

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**Abstract:** Public sector innovation holds transformative potential in addressing digital inequality, particularly among marginalized women in coastal regions. However, the gender digital divide remains persistent due to socio-cultural and infrastructural barriers. This study examines how digital literacy, diffusion of innovation, and digital infrastructure affect the digital divide among coastal women in Tangerang Regency, Indonesia. Using a quantitative approach and Structural Equation Modeling-Partial Least Squares (SEM-PLS), data were collected from 400 respondents and analyzed to assess the impact of key constructs on digital inequality. The findings reveal that all three factors significantly reduce the digital divide, with digital literacy being the strongest determinant. The study also affirms the relevance of the Diffusion of Innovation Theory in understanding digital adoption patterns among underserved populations. A multifaceted strategy involving capacity-building, infrastructure development, and inclusive innovation diffusion is essential to bridge the gender digital divide. The research provides empirical insights for policymakers, emphasizing the need for community-centered and gender-responsive digital policies.

**Keywords:** Digital literacy, Gender digital divide, Coastal women, Public sector innovation, Diffusion of innovation.

### INTRODUCTION

In the era of digital transformation, public sector innovation has emerged as a critical mechanism to address structural inequalities in access to digital resources, particularly for marginalized rural communities. The implementation of digital services by governments commonly referred to as e-Government has the potential to significantly enhance accessibility, transparency, and participation in public services. In Indonesia, and specifically in Tangerang Regency, multiple initiatives have been launched to modernize public services and improve citizen engagement through digital platforms. These include integrated public service

applications, online reporting tools, and tax information systems that aim to increase efficiency and responsiveness in governance.

However, despite these advancements, disparities in access to digital services remain, especially among women living in coastal and rural areas. Coastal women, in particular, face intersecting challenges due to limited infrastructure, low digital literacy, socio-economic constraints, and prevailing cultural norms that inhibit their digital participation. These barriers hinder their access to information, public services, education, healthcare, and economic opportunities, thus deepening the cycle of exclusion and inequality (Gautam & Mani, 2024; Bongomin et al., 2024).

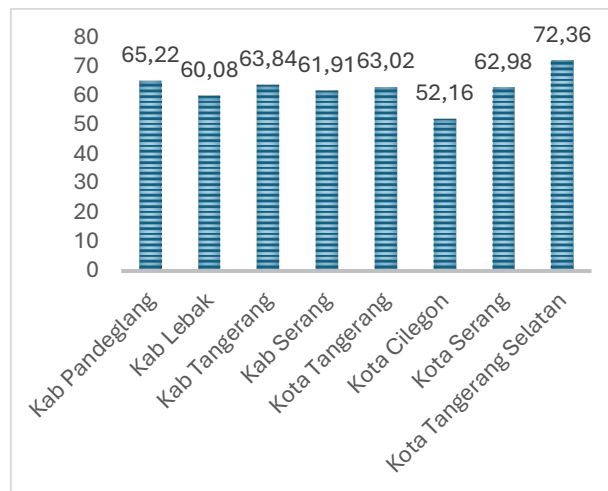
Research has shown that digital public services can catalyze inclusion if they are accessible and inclusive by design. Digital tools can bridge distances, bypass bureaucratic inefficiencies, and offer scalable solutions to engage underrepresented communities. In this context, public sector innovation plays a pivotal role not only in deploying technology but in designing systems that are socially inclusive and equitable (Djatkiko et al., 2025; Reji, Moulya, et al., 2025). Unfortunately, without sufficient digital literacy, infrastructure, and localized policy intervention, these innovations risk reinforcing existing inequalities rather than alleviating them.

While public sector digital innovations have expanded across Tangerang Regency, many women in coastal areas remain digitally marginalized. The root causes are multifaceted: weak internet connectivity, lack of digital education, socio-cultural limitations, and economic dependency. Coastal women often struggle with basic access to devices and reliable internet services. Even when such access exists, digital platforms are underutilized due to limited technical skills and confidence (Gautam & Rai, 2025). In 2015-2019, the implementation of the government of Tangerang Regency has increased compared to 2014, with a national ranking of 123rd (value of 3.1191) and the third position in Banten Province. The implementation of SOPs in 56 OPDs reached 90.32%, but government performance is still hampered by the lack of E-Government integration (Tangerang, 2024). In 2019, there are 35 regional information system applications that are still partial. The government launched *tangerangkab.go.id website* to improve public services, but low internet penetration (5.2%) became an obstacle. Continuous socialization is needed so that the implementation of e-Government is more effective and optimal in supporting public services and bureaucratic efficiency (Suliyanti et al., 2023).



Sources: Dinas Komunikasi dan Informatika Kabupaten Tangerang, 2025  
**Figure 1.** Public Service Innovation in Tangerang Regency, 2025

Figure 1. Showing that Tangerang Regency develops various technology-based innovations to improve the quality of public services. PETIS makes it easier for the public to submit complaints, criticisms, consultations, and suggestions related to health services. *Saturday Services* (SS) allows workers and students to take care of residency documents on holidays. Public Service Malls (MPP) provide integrated services in one location (Zulfa et al., 2023). The Tangerang Gemilang application supports the effectiveness and efficiency of public services, reporting, and complaints. The iPBB application makes it easier for property owners to access tax information, while e-BPHTB accelerates the validation of registration for Land and Building Rights Acquisition Duty. Si CEPOT presents an integrated online UN printing system (Ginanjar, 2019). This innovation aims to improve the accessibility, transparency, and efficiency of digital-based public services in Tangerang Regency (BPS Kabupaten Tangerang, 2023).



Sources: (Septiara Mujadilla & Ginanjar, 2024) (Banten, 2024).

**Figure 2.** Gender Empowerment Index (IDG) by Regency/City in Banten Province, 2023

Figure 2. shows the Gender Empowerment Index (IDG) in Banten Province in 2023, which reflects women's involvement in economic, social, and political development. South Tangerang City has the highest IDG (72.36), showing better women's empowerment than other regions (Septiara Mujadilla & Ginanjar, 2024). Lebak Regency (60.08) and Cilegon City (52.16) had lower IDGs, indicating challenges in gender equality, such as access to education, employment, and leadership positions. Other cities/districts such as Tangerang Regency (63.84) and Serang City (62.98) show a relatively good level of empowerment, but can still be improved. To address the gap, policies are needed that encourage women's access to economic resources, skills training, and participation in public decision-making (Banten, 2024).

Digital literacy skills are essential for coastal women to access opportunities in education (Komalasari et al., 2023), pekerjaan (Ebyatiswara Putra et al., 2023; Susilowati & Mafruhah, 2023), dan kesehatan (Haslinah et al., 2023; Utami & Afrizal, 2022). With digital literacy, coastal women can overcome geographical and social barriers (Astuti et al., 2022; Pahlevi & Jauhariyah, 2022), and improve the knowledge and skills needed to participate in the digital age (Kabakus et al., 2023; Yeşilyurt & Vezne, 2023). Solutions that can be applied from the Women's empowerment program through digital literacy include digital literacy training (Swart et al., 2024), Online Skills Development (Marín & Castañeda, 2023), and the use of supporting applications (Aditya et al., 2021; Aditya & Rahmayanti, 2023; Kabakus et al., 2023).

This situation results in what scholars term the "gender digital divide" a gap in digital access and usage between men and women, often exacerbated in rural and coastal zones. The inability of women to fully utilize digital public services limits their engagement in governance processes and their capacity to make informed decisions about their health, education, finances,

and community involvement. Without deliberate intervention, coastal women risk further exclusion from Indonesia's digital development agenda (Bongomin et al., 2025).

One of the most viable pathways to bridging this divide is through inclusive public sector innovation. Studies have demonstrated that digital inclusion can be fostered through targeted government initiatives that integrate user-centric technology, localized content, and grassroots engagement strategies (Djatkiko et al., 2025). When designed effectively, these programs can reduce barriers, facilitate access, and promote active participation from marginalized groups, especially women. E-Government platforms have been widely recognized as tools for promoting equity in public service delivery. In many developing countries, well-implemented digital service systems have been shown to enhance transparency, accountability, and citizen empowerment. They create opportunities for direct engagement between governments and communities, enabling citizens to report problems, request services, or access information without intermediaries (Bello & Aubert, 2025; Reji, Rajeswari, et al., 2025). When digital innovation is coupled with outreach and training, it can be transformative for previously excluded populations.

To ensure the success of public innovation in addressing gendered disparities, one essential condition is the strengthening of digital literacy among women. Digital literacy goes beyond the technical ability to use devices, it encompasses the competencies to evaluate online content, protect personal data, engage in ethical digital practices, and navigate platforms to access services (Gautam & Rai, 2025). For coastal women, acquiring such skills can significantly shift their role from passive recipients to active users and contributors in the digital ecosystem. Numerous studies have emphasized that tailored literacy programs can help women build confidence, challenge gender norms, and access economic opportunities. Mobile technology, in particular, has proven effective as a delivery mechanism for informal and formal digital training. Smartphones offer flexibility, portability, and cost-effective channels for engagement. However, these tools must be supported by localized training, content in appropriate languages, and community-based support networks (Dillahunt et al., 2025; Gautam & Rai, 2025).

The research theme on public service innovation has been carried out a lot, including public organizations and ICT, and the creation of public value (Eriksson et al., 2023; Neumann et al., 2024; Osborne et al., 2021, 2022; Soto Setzke et al., 2023; Torfing et al., 2021; Trischler et al., 2023), Public sector management education and learning environment (Deppeler et al., 2022; Glor, 2021; Jin et al., 2022; Mursyidah et al., 2021; Parinasan et al., 2024; Peng & Li, 2021; Sung & Kim, 2021), Adoption of AI and product service innovation (Bhat & Sharma, 2021; Blommerde, 2023; Heinonen & Strandvik, 2021; Kustrak Korper et al., 2022; Mariani et al., 2023; Smyrnova et al., 2021; Taques et al., 2021; Vaillant et al., 2023), Development of village data and information management (Hartley & Knell, 2022; Prabawati et al., 2023), Dynamic capabilities of government and public value creation (Barrutia et al., 2022; Kim & Kim, 2022; Skålén, 2022), Innovation and co-production laboratory in public problem solving (Heinonen & Strandvik, 2021; McGann et al., 2021; Taques et al., 2021), Organizational Performance of Public Sector Organizations and the Role of Transformational Leadership Moderation (Ahmad et al., 2022; Engen et al., 2021; Hansen et al., 2021; Hoai et al., 2022)

Despite growing academic and policy interest in e-Government and digital inclusion, there is a noticeable gap in research that specifically focuses on the intersection of public sector innovation, digital literacy, and the gender digital divide particularly among women in coastal Indonesian contexts. Much of the literature remains centered on urban digital adoption or general rural development, often overlooking the nuanced challenges faced by women in semi-isolated or low-infrastructure environments (Bongomin et al., 2025; Djatkiko et al., 2025). Moreover, while the diffusion of innovation theory has been widely applied to explain

technology adoption at the organizational and urban levels, its application to gendered digital inclusion within public service contexts is underexplored. Understanding how innovation diffuses among coastal women, and the roles played by observability, trialability, and social influence can provide crucial insights for more inclusive governance models.

This study aims to explore the role of public sector innovation and digital literacy in minimizing the digital divide among coastal women in Tangerang Regency. It adopts the Diffusion of Innovation Theory as its conceptual lens to examine how innovations in public service delivery can be effectively adopted in marginalized contexts.

The specific objectives of this research are to:

1. Analyze the influence of public sector innovation on the digital divide among coastal women.
2. Assess the impact of digital literacy on coastal women's access and use of digital public services.
3. Identify the socio-technical factors that hinder or facilitate innovation adoption in low-infrastructure coastal areas.
4. Offer policy recommendations for designing inclusive digital public services.

The scientific contribution of this study lies in its integrated approach that combines innovation diffusion theory with gender-sensitive digital inclusion. It provides empirical data on how digital public services are received by coastal women and identifies practical levers for improving adoption. The study not only enriches the discourse on inclusive e-Government but also informs policymakers, local administrators, and civil society organizations on how to design, communicate, and implement innovations that leave no one behind.

## **Theoretical Framework**

### **Diffusion of Innovation**

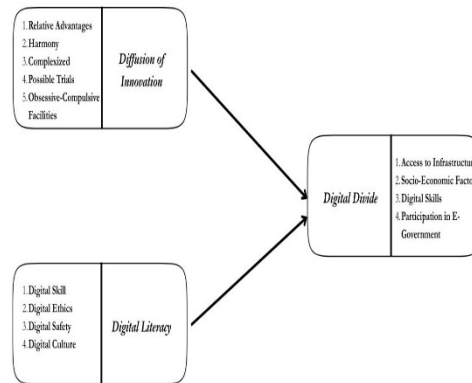
Innovation diffusion includes the process of how an innovation or technology is accepted and adopted by society. The speed of adoption is greatly influenced by several factors, such as relative superiority, compatibility with values and needs, complexity of use, the ability to try first, and how easily the innovation is observed or seen to be successful (Rogers, 2003).

### **Digital Literacy**

Digital literacy encompasses the ability of individuals to access, evaluate, and use information available through digital technologies. Digital literacy also includes technical skills in using digital devices and applications, an understanding of digital ethics, and the ability to manage data security and online privacy (Dillahunt et al., 2025; Gautam & Rai, 2025).

### **Digital Divide**

The digital divide includes differences in access, use, and skills of technology between groups that have sufficient resources and those that do not. The digital divide also includes limited access to digital devices, internet connections, and adequate training (Bongomin et al., 2025).



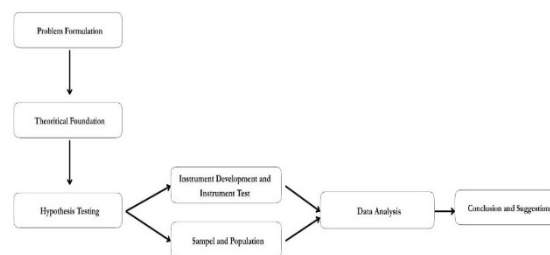
**Sources:** (Bawden, 2001; Garcia-Aviles, 2020; Kemenkominfo, 2022; Rogers, 2003; Tarcher & Bauerlein, 2016)

**Figure 3.** Dimensions of Innovation Diffusion, Digital Literacy, and Digital Divide  
 H1: Diffusion of Innovation has a positive effect on the digital divide of coastal women in Tangerang Regency  
 H2: Digital Literacy has a positive effect on the digital gap of coastal women in Tangerang Regency

**METHOD**

**Research Design**

This study employs a quantitative research design to explore the influence of public sector innovation and digital literacy on minimizing the digital divide among coastal women in Tangerang Regency, Indonesia. The analytical approach utilizes Structural Equation Modeling-Partial Least Squares (SEM-PLS) to examine the causal relationships among the key variables: diffusion of innovation, digital literacy, and the digital divide. This method is chosen due to its suitability for analyzing complex models with latent variables and its robustness with smaller sample sizes and non-normal data distributions.



**Figure 4.** describes the stages of this research, starting from the formulation of the problem, the theoretical foundation, the testing of hypotheses containing samples and populations, research instruments, data analysis, and finally conclusions and suggestions

1. Population : Coastal women in the 8 sub-districts
2. Sample : Using a Teknik sample probability in the coastal area of Tangerang Regency covering 8 sub-districts.
3. Sample Size : 356,273 Females
4. Slovin Formula : The Slovin formula is used to determine the number of samples needed in a study from a limited or known population. After using the slovin formula with a margin of error of 5%, the result was 399.55 then rounded to 400 people.

**Data Collection**

1. Instrument: The use of an online questionnaire consisting of a number of statement items designed to measure the diffusion of innovation, digital literacy against the digital divide
2. Measurement Scale: Likert is on a 5-point scale, from "strongly disagree" to "strongly agree".

**Research Instruments**

The instrument used in this study is a survey to determine the level of women's digital gap in Tangerang Regency towards public sector innovation. This questionnaire consists of: Diffusion of Innovation, Digital Literacy, and Digital Divide.

**Table 1.** Research Instruments

No.	Variabel	Indikator	Number of Question
1	Diffusion of Inovation	Relative Advantages	1
		Harmony	1
		Complexized	1
		Possible Trials	1
		Obsessive-Compulsive Facilities	1
2	Digital Literacy	Digital Skill	1
		Digital Ethics	1
		Digital Safety	1
		Digital Culture	1
3	Digital Divide	Access to Infrastructure	1
		Socio-Economic Factors	1
		Digital Skills	1
		Participation in E-Government	1

Furthermore, the following is the design of the questions on the questionnaire in this study:

**Table 2.** Questionnaire Design

No	Variabel	Question
1	Diffusion of Inovation	How much benefit do you feel by using digital technology compared to traditional ways
		Whether the current digital technology is in line with your daily needs or habits
		How difficult do you find using new digital technologies
		How likely are you to try a new technology if you hear about it or are given information
		Do you find it easy to observe how others use digital technology in their daily lives
2	Digital Literacy	How confident you are in your ability to use digital devices in everyday life
		How important do you think it is to understand the ethics of using digital technologies, such as privacy and data protection
		How much attention do you pay to the security of your personal data when using digital technology
		How much influence digital culture (such as social media use or e-commerce) has on your social life

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3	Digital Divide	Do you feel that internet or technology access in your coastal area is sufficient to support your digital needs How much influence economic factors affect your ability to access digital technology How good are you in using digital applications or services for daily activities How often you use government-provided digital services
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### Data analysis

To analyze the data in this study, we used the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS) approach, using SmartPLS software version 4 as recommended by Jang, (2025). The SEM-PLS model is used because of its ability to test the complex relationships between latent variables, which in this study include diffusion of innovation, digital literacy, and digital divide.

#### Analysis Steps

##### 1. Validity and Reliability Testing

Before proceeding with further analysis, the first step is to test the validity and reliability of the measurement model. This is done to ensure that each indicator used to measure the variables in the model is of good quality.

1. Convergent Validity: Using the Average Variance Extracted (AVE), which must be greater than 0.5 to indicate that the indicators actually measure the variable in question.
2. Reliability: Measured using Composite Reliability (CR) and Cronbach's Alpha. CR and Cronbach's Alpha values greater than 0.7 indicate good reliability of the measured construct.

##### 2. R-Square Testing ( $R^2$ )

After ascertaining validity and reliability, the next step is to calculate the R-square value to measure how much proportion of variance in the dependent variable can be explained by the independent variable in the model. Chin, (1998), stated that a higher  $R^2$  value indicates that the model can better explain the variance of the data.

Interpretation of the value of  $R^2$ :

1.  $R^2$  low : 0,19
2.  $R^2$  medium : 0,33
3.  $R^2$  tall : 0,67

##### 3. Hypothesis Test

To test the hypothesis in this study, we conducted a hypothesis test using the bootstrapping technique available in SmartPLS. Bootstrapping is used to obtain t-statistics and p-values that allow us to test the significance of relationships between variables in the model.

1. If the t-statistic is greater than 1.96 and the p-value is less than 0.05, then the relationship between the variables is considered significant.

Hypothesis tests were carried out to test the influence of diffusion of innovation and digital literacy on the digital divide, as well as to confirm whether these relationships are in accordance with the hypotheses proposed in this study

## RESULTS AND DISCUSSION

### Results

This chapter presents the empirical findings of the study in four main subsections: (1) respondent demographics, (2) evaluation of measurement model, (3) structural model results,

and (4) hypothesis testing. The findings were derived from a sample of 400 coastal women in Tangerang Regency, Indonesia.

### 1. Respondent Demographics

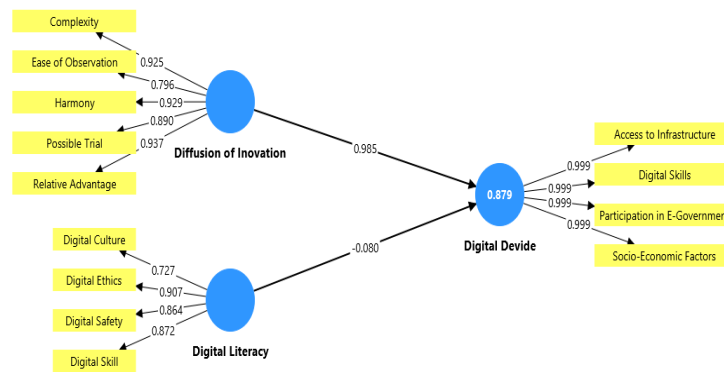
A total of 400 respondents participated in the survey. The demographic distribution is as follows:

No	Description	Measurement	Percentage	Score
1	Age	16 - 22	1	0,3
		23 - 29	58	14,5
		30 - 36	137	34,3
		37 - 43	129	32,3
		44 - 50	74	18,5
		51 - 57	1	0,3
2	Education	Elementary School	1	0,3
		Junior High School	85	21,3
		Senior High School	262	65,5
		D3/Diploma	48	12
		S1	4	1
3	Occupation	Fisherman	62	15,5
		Cooperative Members	103	25,8
		Merchant	82	20,5
		Housewives (IRT)	104	26
		Other	49	12,3
4	Marital status	Marry	400	100
5	Have a Gadgets	Ya	400	100
6	period of Owning a Gadgets	> 2 years	2	0,5
		2-4 Years	166	41,5
		4 Years <	232	58

These demographics provide critical context for understanding the digital divide and the varying levels of digital literacy.a

The following section presents the findings of a study that analyzes the factors that affect the digital divide for coastal women in the Tangerang Regency area. This analysis examines the relationship between the diffusion of innovation, digital literacy, and the digital divide. This relationship is investigated using a structural equation modeling (SEM) approach, as illustrated in the diagram below

## 2. Visualization of the Structural Model



Processed by the author using SmartPLS

Figure 5. Path coefficient graph

Figure 5. describes a structural equation modeling (SEM) model that shows the relationship between Innovation Diffusion, Digital Literacy, and Digital Divide. In this model, the diffusion of innovation affects digital literacy which in turn has an impact on reducing the digital divide. Some of the elements that influence the diffusion of innovation, such as ease of observation, ability to try, and relative superiority, confirm that the easier the technology is accessed, the faster it is accepted by the public. Factors with high scores on these aspects (such as ease of observation with a value of 0.796 and the ability to try with a value of 0.890) suggest that when the technology is more visible in its benefits and allows for limited conversations or experiments before adoption, society will be more receptive to it. In addition, digital literacy has a crucial role in reducing the digital divide. Digital literacy encompasses digital skills, digital security, digital ethics, and digital culture, all of which have a profound impact on an individual's ability to access and utilize technology. The figure also shows that digital literacy is closely related to the reduction of the digital divide, where digital skills and digital security have high scores (0.872 and 0.864, respectively), emphasizing that technical skills as well as an understanding of data protection are essential to ensure equal access to technology. Therefore, increasing digital literacy can reduce inequalities in access to technology and information. In terms of the influence on the digital divide, this model shows that various factors from the diffusion of innovation and digital literacy have a major impact on reducing the digital divide. Access to infrastructure and participation in e-government suggest that more accessible and usable technologies will help reduce inequality, with a very strong influence (value 0.999 on both factors). This emphasizes the importance of equitable access to digital-based technology and public services in reducing the digital divide. The socioeconomic factors that also contribute with a value of 0.999 indicate that socio-economic conditions affect how much an individual has access to technology and how much they can utilize technology in their lives.

The path coefficient between these variables shows the strength and direction of the relationship between innovation diffusion, digital literacy, and digital divide. This model shows that the diffusion of innovation and digital literacy has a significant positive impact on reducing the digital divide, while socio-economic factors show a positive influence, albeit with a lower power. Access to infrastructure, on the other hand, has a very strong influence in reducing the digital divide, followed by digital skills and participation in e-government, which also shows a substantial positive influence.

### 3. Descriptive Statistics (n = Number of Respondents)

**Table 3.** Descriptive Statistics

	n	Minimum	Median	Maximum	Mean	Standard Deviation
Diffusion of Inovation	400	1.200	3.000	4.600	3.031	0.780
Digital Divide	400	2.000	3.000	4.500	2.997	0.452
Digital Literacy	400	1.100	3.009	4.880	3.019	0.941

Processed by the author using SmartPLS

Table 3 presents descriptive statistics of the three main variables tested in this study, namely Innovation Diffusion, Digital Gap, and Digital Literacy, with each variable having a sample of 400 respondents. This data provides a comprehensive overview of the distribution of values for each variable, including minimum, median, maximum, mean, and standard deviations, all of which provide important insights into respondents' perceptions.

In the Innovation Diffusion variable, the range of values varies between 1,200 to 4,600, indicating a fairly wide distribution. The median score was recorded at 3,000, which indicates that half of the respondents gave a lower rating and the other half higher. A mean of 3,031 indicates a slight tendency to give a higher rating compared to the median, indicating that most respondents have a tendency to be more accepting of innovation. With a standard deviation of 0.780, the variation between respondents in perceptions of innovation diffusion can be said to be moderate, indicating that there is a significant diversity in their views on innovation.

For the Digital Gap variable, the value range is between 2,000 and 4,500, while the median is recorded at 3,000. The average value that is almost identical to the median (2,997) shows a relatively symmetrical distribution around the midpoint, reflecting the uniformity of respondents' perceptions of the digital divide. With a standard deviation of 0.452, there was a fairly high uniformity in the respondents' views, with relatively low variation. In the Digital Literacy variable, a wider range of values was recorded between 1,100 to 4,880. The median was recorded at 3,009, which indicates that half of the respondents gave a lower rating and the other half higher. The mean value of 3.019 is slightly higher than the median, indicating an almost balanced distribution. However, a high standard deviation (0.941) indicates a greater variation in respondents' digital literacy levels, suggesting that there is a significant difference in the level of digital skills possessed by them.

#### 4. Results of reliability and validity measurements

**Table 4.** Reliability and Validity

	<b>Alpha Cronbach</b>	<b>Composite Reliability (rho_A)</b>	<b>Composite Reliability (rho_C)</b>	<b>Extracted Average Variance (AVE)</b>
Diffusion of Inovation	0.939	0.955	0.953	0.804
Digital Divide	0.999	0.999	1.000	0.998
Digital Literacy	0.867	0.902	0.909	0.715

Sources: Processed by the author using SmartPLS

Table 2 presents the results of reliability and validity testing conducted on three main variables in the model, namely Innovation Diffusion, Digital Gap, and Digital Literacy. This test involved a number of important indicators in structural equation (SEM) modeling models, such as Alpha Cronbach, Composite Reliability (rho\_A and rho\_C), and Extracted Average Variance (AVE). These indicators provide an idea of how good the internal consistency and validity of the variables in this model are for future analysis.

Cronbach's alpha is used to measure internal consistency, where higher values indicate better reliability. The Alpha Cronbach value for Innovation Diffusion is 0.939, which indicates that this variable is highly reliable. The Digital Divide and Digital Literacy obtained scores of 0.999 and 0.867, respectively, which indicates that although the Digital Divide has near-perfect reliability, Digital Literacy is still acceptable albeit slightly lower. Composite Reliability (rho\_A and rho\_C) measures the extent to which the indicators used can reflect the construct in question. The rho\_A and rho\_C values for Innovation Diffusion are 0.955 and 0.953, which indicate excellent consistency in measuring the variables. The Digital Gap has a value of 0.999 for both indicators, indicating very high reliability. Digital Literacy obtained values of 0.902 and 0.909, which indicates fairly good reliability although it is slightly lower compared to the other two variables. Extracted Average Variance (AVE) measures how well the variables in this model can explain the variance in each indicator. The AVE value for Innovation Diffusion is 0.804, which suggests that this variable can explain most of its indicator variance well. The Digital Gap shows an AVE value of 0.998, which indicates a very high quality of measurement in explaining the variance of its indicators. Meanwhile, Digital Literacy has a slightly lower AVE value of 0.715, although it is still within acceptable limits, which suggests that this model is quite effective in explaining the variance of indicators.

The results of this test show that the model used has good reliability and validity. The Digital Divide showed near-perfect measurements, while Innovation Diffusion and Digital Literacy also showed excellent reliability despite slight differences in AVE values and reliability. These findings provide confidence that the model used in this study is solid and reliable to analyze the relationship between variables that play a role in reducing the digital divide.

**5. R-square**

**Table 5. R-square**

	R-square	
Digital Divide	0.879	Tinggi

Processed by the author using SmartPLS

Table 3 shows the R-square value for the Digital Divide of 0.879, which reflects a very strong relationship between the variables analyzed in the model. An R-square value of this magnitude indicates that about 87.9% of the variations that occur in the Digital Divide variable can be explained by the applied model. In a statistical context, this value can be categorized as high, which indicates that the model is very good at explaining data variations. In general, an R-square value above 0.80 is considered a strong indication that the model used provides very adequate results. Therefore, these results show that the variables tested in this study have a significant influence on the digital gap phenomenon, and the model used is quite effective in describing the relationship between the variables involved.

**6. Hypothesis Test**

**Table 4. Hypothesis Test**

	Original Sample (O)	Average Sample (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Value	
Diffusion of Inovation -> Digital Divide	0.985	0.985	0.016	61.234	0.000	Accepted
Digital Literacy-> Digital Divide	0.080	0.080	0.024	3.283	0.001	Accepted

Processed by the author using SmartPLS

Table 4 shows the results of the Hypothesis Test which tests two main relationships, namely Diffusion of Innovation to the Digital Divide and Digital Literacy to the Digital Divide.

1. The diffusion of Innovation to the Digital Divide shows a very high Statistical T value, which is 61,234, with a very low P Value (0.000), which means that this relationship is very statistically significant. The identical Original Sample (O) and Average Sample (M) values (0.985) show that this model is excellent in illustrating the relationship between the adoption of new technologies and the reduction of the digital divide.

Digital Literacy to Digital Divide, although the lower T Statistics value (3.283) and the still significant P Value (0.001) show a positive and significant influence, the effect is smaller than the Diffusion of Innovation. Nonetheless, these results indicate that Digital Literacy continues to play an important role in reducing the digital divide, especially in terms of improving individuals' ability to access and utilize technology effectively.

## DISCUSSION

The results of this study show two main findings regarding the influence of Diffusion of Innovation (DOI) and Digital Literacy on the Digital Divide on coastal women in Tangerang Regency. First, the results of the hypothesis test show that the Diffusion of Innovation has a very significant influence on reducing the Digital Divide. The very high T Value (61,234) and the very low P Value (0.000) indicate that the adoption of new technologies by coastal women can accelerate the reduction of the digital divide in the region. X. Zhang, (2018), It shows that Frugal Innovation, which includes technology at a more affordable price, can reduce the digital divide, which is relevant in the context of the adoption of new technologies by coastal women who often face limited resources. supporting the relevance of Innovation Diffusion Theory (Rogers, 2003). These results are corroborated by Reji, Rajeswari, et al., (2025) and Jain & Mitra, (2025), who found that perceived attributes such as relative superiority and trial capability influenced the adoption of digital technologies. Public sector innovations, when disseminated effectively, can reduce resistance to change and increase adoption rates among underserved groups. For example, as shown in the study Lee et al., (2025) On the Rwanda Digital Ambassador Program, peer-led interventions have proven effective in promoting the use of technology in marginalized communities. The application of such a model in Indonesia can overcome socio-cultural resistance and build a grassroots digital ecosystem.

In the second hypothesis, Digital Literacy also showed a significant influence on the Digital Divide, although the influence was smaller than the Diffusion of Innovation. The test results showed a T Statistics of 3,283 and a very small P Value (0.001), indicating that digital literacy does play a role in reducing the digital divide. Digital literacy not only enhances women's technical capabilities but also empowers them to participate more fully in the digital economy and public services. The role of digital access, skills, and security, as measured in this study, highlights that empowering women with digital competencies is critical to promoting meaningful inclusion. Shrestha, (2020), highlighting that the gender digital divide is greatly influenced by socio-economic and cultural factors, which hinder women from accessing and using technology optimally. Gautam & Rai, (2025), which emphasizes the importance of informal digital learning mechanisms, such as the use of smartphones among rural women. These findings are also in line with Dillahunt et al., (2025), who argue that the development of collective digital literacy is essential to reduce structural inequalities.

However, while the Diffusion of Innovation and Digital Literacy have proven to play an important role, limited access to digital infrastructure and socio-economic barriers experienced by coastal women remain major obstacles in reducing the digital divide. Research by Foteinou, (2010), suggests that the digital divide is often influenced by social factors, such as gender roles and cultural norms that limit women's use of technology. This is in line with the findings of the X. Zhang, (2023), which underlines the importance of a more inclusive digital literacy policy, which not only teaches technical skills but also changes social perceptions regarding women and technology. Meanwhile, Lohr, (2025), emphasizes that social and economic factors, such as education level and access to technology, play a key role in reducing the digital divide among women, and therefore, policies that focus not only on access to technology, but also on women's socio-economic empowerment are needed.

Infrastructure deficits in coastal areas exacerbate gender inequality, as women often have limited mobility and fewer opportunities to access urban centres with better connectivity. Therefore, investment in community internet centers, rural telecommunications projects, and device subsidies is essential.

The study's demographic analysis reveals that women with lower levels of education and income face greater challenges in accessing and benefiting from digital services. These findings echo Lilford et al., (2025) and Seddighi & Corneliusen, (2025), which notes that cultural expectations and structural inequalities influence digital behavior. In many coastal

communities, entrenched gender roles continue to limit women's time, autonomy, and decision-making power regarding the use of technology. Addressing this requires culturally sensitive strategies, including awareness campaigns involving male family members, and women-centered digital programs designed to align with their daily routines and social contexts.

The evidence suggests that effective public policy interventions must be comprehensive. As illustrated by international examples, including Rwanda, Brazil, and Ghana, multi-stakeholder collaboration between governments, NGOs, and the private sector can yield impactful results. Programs such as the Rwanda Digital Ambassador Program Jang, (2025) and rural innovation hubs in Ghana Amankona et al., (2025) provide a tested model for building local solutions.

In Indonesia, such initiatives must be local and inclusive. Community-based digital training centers, mobile digital literacy units, and women's digital champions can serve as important supporters. Additionally, partnerships with local higher education institutions and cooperatives can improve outreach and sustainability.

This study contributes to the expansion of Innovation Diffusion Theory in public administration, especially by demonstrating its empirical relevance to marginalized female populations. It validates that the perceived attributes of innovation are not only applicable to organizational settings but are also important for understanding user-level adoption in underserved areas. In practical terms, these findings highlight the importance of integrating digital literacy and infrastructure in public sector innovation strategies. Without user readiness and equality of access, digital public services risk reinforcing, rather than reducing, inequality.

#### Limitations and Future Research Directions

Although the study provides valuable insights, it has several limitations. First, its geographic focus on Tangerang Regency limits generalizability to other coastal or rural areas. Second, the use of self-reported data may introduce bias. Lastly, the cross-sectional design cannot capture longitudinal changes in behavior and technology adoption. Future research should explore comparative studies across different regions, incorporate qualitative methods to deepen contextual understanding, and assess long-term impacts of policy interventions. Further exploration of collective digital efficacy, as suggested by Dillahunt et al., (2025), may also enhance models of public digital inclusion.

The study confirms that digital literacy, innovation diffusion, and digital infrastructure are central to reducing digital inequality among coastal women. It highlights the critical need for holistic, inclusive, and locally grounded public innovations. By connecting empirical findings with theoretical and global insights, this chapter underscores that bridging the gender digital divide is not merely a technological issue, but a multidimensional challenge requiring collaborative, sustained action. This chapter presents the empirical findings of the study in four main subsections: (1) respondent demographics, (2) evaluation of measurement model, (3) structural model results, and (4) hypothesis testing. The findings were derived from a sample of 400 coastal women in Tangerang Regency, Indonesia.

## CONCLUSION

This study investigated the relationship between digital literacy, diffusion of innovation, and digital infrastructure in reducing the digital divide among coastal women in Tangerang Regency, Indonesia. The results from the SEM-PLS analysis show that all three factors significantly and negatively influence the digital divide, with digital literacy emerging as the most influential predictor. These findings validate the theoretical applicability of the Diffusion of Innovation Theory within marginalized public user groups and underscore the importance of integrating digital capacity-building efforts into public service innovation.

In practical terms, the study highlights that promoting digital skills, ensuring inclusive technology dissemination, and improving infrastructure access are essential to reducing

gender-based digital inequalities. Policy interventions should be community-based, gender-sensitive, and reinforced by local partnerships. Addressing cultural norms, educational gaps, and economic limitations is equally critical. Future research should consider broader geographic contexts and longitudinal designs to capture behavioral changes over time. It should also explore the role of digital collectives and participatory design in enhancing the effectiveness of digital public services.

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