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Evaluation of Village E-Government in Banyumas Regency Using the UN E-Government Development Index

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Abstract — In modern governance practices, digital transformation has become a fundamental foundation for improving the quality of public services, transparency, and participation. This study aims to assess the maturity level of e-government implementation across all villages in Banyumas Regency. Using a quantitative approach and census method, this research employs an evaluation model consisting of eleven parameters. The first stage involved determining the total number of villages in Banyumas Regency (297 villages), followed by direct observation to assess the availability of official village websites. The findings show a very high adoption rate, with 285 villages (96.0%) maintaining an active online presence. These 285 websites were then classified into two categories—278 Independent and 7 Integrated—and further evaluated using ten additional parameters adapted from the four-stage UN E-Government Development Index (UN-EGDI), covering Emerging, Enhanced, Transactional, and Connected Presence. The results provide a comprehensive mapping of the two models of village e-government implementation and highlight significant disparities between website availability and functional service delivery. Although adoption is nearly universal, the functional maturity of village websites remains relatively low, indicating a clear gap in digital service readiness. The insights from this study are expected to support strategic policy formulation aimed at promoting more equitable and sustainable digital transformation at the village level. As future work, this research will be extended to the provincial scope by evaluating e-government maturity across districts and cities in Central Java Province.

Keywords – e-government, digital transformation, village governance, maturity level, public service, Banyumas Regency

I. INTRODUCTION

The rapid development of Information and Communication Technology (ICT) has increasingly encouraged governments to enhance the efficiency, transparency, and accessibility of public services [1]. In Indonesia, village governments play an important role as the administrative units closest to the community, making them the frontline actors of digital transformation in governance [5][7]. The adoption of electronic government (e-government) at the village level provides significant opportunities to improve administrative performance, accelerate information dissemination, and expand community engagement through digital platforms.

Village websites serve as the primary gateway connecting villages with their residents, both within and beyond their local areas. These websites can strengthen transparency in budgeting, promote local economic and tourism potential, and—most importantly—facilitate online administrative services that are accessible to citizens at any time. Therefore, the existence of village websites serves as an important indicator of digital readiness within governmental institutions at the grassroots level.

Banyumas Regency, one of the regencies in Central Java Province, consists of 297 villages with diverse geographical and demographic characteristics and is among the regions actively promoting village digitalization initiatives. However, despite the relatively high rate of village website adoption, the maturity level of e-government implementation has not yet been comprehensively evaluated. Therefore, this study aims to identify the extent to which village website ownership in Banyumas Regency has achieved the current level of e-government service maturity through an eleven-parameter evaluation model, as well as to develop strategic recommendations to further enhance the quality of digital public services in the future. By providing an in-depth overview of digital development among the villages of Banyumas Regency, this study is expected to contribute valuable insights for regional policy planning and support the acceleration of digital transformation toward more inclusive and sustainable village governance.

II. LITERATURE REVIEW

E–Government refers to the utilization of Information and Communication Technology (ICT) by governments to improve the efficiency, transparency, and quality of public service delivery. Over time, various maturity models have been developed to assess the progress of e-government implementation. Among these, one of the most widely recognized is the four-stage evolution model introduced by the United Nations E-Government Development Index (UN-EGDI) framework [1]. This model categorizes e-government development into four progressive stages, namely Emerging Presence, Enhanced Presence, Transactional Presence, and Connected Presence, each representing a higher level of integration, interactivity, and service delivery capability within digital governance systems.

Previous studies, such as those conducted by Kriyar et al. [2], emphasized public participation as a crucial component of digital governance, while Khan and Zaber [8] adapted the United Nations model to better reflect the context of developing countries. Additional research has further highlighted challenges and opportunities in rural digital governance, including the need for human–centered website development [3], local digital capacity building [7], and the role of village information systems in strengthening grassroots e-government practices [5][6]. Building upon these studies, this research adopts a synthetic approach, starting with the availability of village websites, followed by an evaluation using ten quality parameters aligned with the four developmental stages of the UN E-Government framework.

III. RESEARCH METHOD

This study employs a quantitative research approach combined with direct observation of all active village websites to obtain empirical data on the current state of e-government implementation at the village level. The research was conducted across all 297 villages in Banyumas Regency, covering the entire population to ensure comprehensive and representative analysis of digital governance practices.

A. Data Collection Technique

Data were collected through direct observation conducted in October 2025 and carried out in two consecutive stages to ensure validity and accuracy of the findings.

1. *Stage 1: Website Availability Census.* Each of the 297 villages was carefully and systematically examined to determine whether it possessed an active and accessible official website. As a result, 285 villages were found to have active websites, while the remaining 12 villages did not. Villages without an active website were assigned a binary score of 0 and were excluded from the subsequent evaluation stage.
2. *Stage 2: Functional Quality Assessment.* All 285 active websites were further inspected individually. The researcher manually navigated through each available component, including the main menu, sub-menus, informational pages, and footer sections, to verify whether the required digital service features were present and functional. A binary scoring method was applied, assigning 1 if a feature was available and functional, and 0 if it was absent or non-operational. All findings were documented in a structured digital checklist to maintain consistency and traceability throughout the evaluation process.

B. Scope and Limitation

This study specifically focuses on villages as autonomous government entities. A total of 30 district (urban administrative units) in Banyumas Regency were intentionally excluded from the quantitative analysis. Preliminary observations revealed that these district do not operate independent websites but are instead integrated as subdomains under the regency government's central portal. The fundamental differences in administrative autonomy and digital strategy between villages and district serve as the primary reason for their exclusion, in order to maintain data consistency and research validity throughout the evaluation process.

C. Assessment Framework and Parameters

This study focuses exclusively on villages, as they possess administrative autonomy in managing digital public services [5]. A total of 30 districts were excluded because their websites are integrated under the regency portal and thus do not represent independent e-government implementation. This exclusion ensures data consistency and methodological validity throughout the evaluation.

D. Data Analysis Technique

The collected data were analyzed using the following procedures:

1. Descriptive Statistical Analysis: Data obtained from *Stage 1: Website Availability Census* were analyzed to determine the overall website adoption rate and its distribution across sub-districts.
2. Scoring Classification Analysis**:** Data from *Stage 2: Functional Quality Assessment* were classified into two implementation models: Independent Villages and Integrated Villages. The total scoring results from all eleven parameters were compared to map the maturity level of village e-government services, and to identify common strengths and weaknesses in digital implementation within Banyumas Regency.

Table 1. Assessment Parameters for Village E-Government Maturity

No	Maturity Level	Assessment Parameters
1	Availability	P1. Active and accessible official website
2	Level 1: Emerging Presence	P2. Institutional profile information P3. Basic public information P4. Information on services and local potentials
3	Level 2: Enhanced Presence	P5. Website accessibility and functional navigation P6. Availability of downloadable public documents
4	Level 3: Transactional Presence	P7. Active interaction channels P8. Online administrative services
5	Level 4: Connected Presence	P9. Social media integration P10. Policy participation support P11. External system connectivity

IV. RESULT

This section presents the quantitative findings of the study regarding the adoption rate and functional quality of village websites in Banyumas Regency. The results are described based on observations of all 297 villages, with a focus on the 285 active websites identified during the observation period in October 2025.

A. Village Website Adoption Rate

The results from Stage 1: Website Availability Census indicate that 285 villages (95.96%) in Banyumas Regency already have an active and accessible official website, while 12 villages (4.04%) do not have any online presence. This high adoption rate demonstrates strong institutional efforts toward digital transformation at the village government level and reflects a widespread commitment to advancing e-government adoption across rural administrative units. These findings also provide a clear baseline for understanding the distribution of digital readiness across different areas within the regency.

The distribution of website adoption across sub-districts, based on the researcher's manual verification, is presented in Table 2. providing a clearer picture of how digital adoption varies across different administrative areas.

Table 2. Village Website Adoption Rate by Sub-district (October 2025)

No	Sub-district	Villages	Websites	%
1	Ajibarang	15	13	86.7
2	Banyumas	12	11	91.7
3	Baturraden	12	12	100
4	Cilongok	20	19	95
5	Gumelar	10	10	100
6	Jatilawang	11	11	100
7	Kalibagor	11	8	72.7
8	Karanglewas	13	13	100
9	Kebasen	12	12	100
10	Kedungbanteng	14	14	100
11	Kembaran	16	16	100
12	Kemranjen	15	15	100
13	Lumbir	10	9	90
14	Patikraja	12	12	100
15	Pekuncen	16	14	87.5
16	Purwojati	10	10	100
17	Purwokerto Barat	-	-	-
18	Purwokerto Selatan	-	-	-
19	Purwokerto Timur	-	-	-
20	Purwokerto Utara	-	-	-
21	Rawalo	9	9	100
22	Sokaraja	18	17	94.4
23	Somagede	9	9	100
24	Sumbang	19	19	100
25	Sumpiuh	11	10	90.9
26	Tambak	11	11	100
27	Wangon	11	11	100
Total		**297**	**285**	

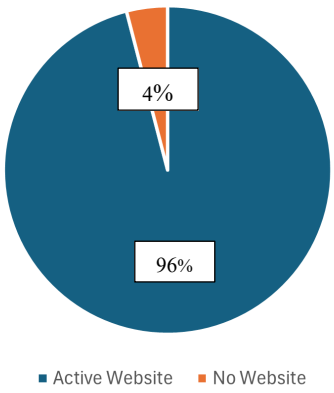

Fig 1. Website Adoption Rate in Banyumas

Based on the final data summarized in Table 2, the majority of sub-district in Banyumas Regency

demonstrate a very high adoption rate of village websites, with 15 sub-districts achieving full (100%) adoption. In contrast, the sub-districts with the lowest adoption rates are Kalibagor (72.7%), followed by Ajibarang (86.7%) and Pekuncen (87.5%). It is important to note that the four sub-districts within the Purwokerto urban area—namely West, South, East, and North Purwokerto—were excluded from this analysis, as they consist solely of district administrative units and therefore fall outside the scope of this village level e-government assessment.

B. Classification of Active Websites

Among the 285 verified active village websites, a classification based on hosting and management structure indicates that 278 websites (97.5%) are categorized as Independently Managed Villages (*Desa Mandiri)*. The remaining 7 websites (2.5%) belong to the Integrated Village (*Desa Terintegrasi*) category, in which the digital presence is operated as part of the regency-level portal under centralized management.

C. Analysis of Website Quality Scores (11Parameters)

The functional quality evaluation of the 285 active village websites generated a summary of statistical scores. This assessment was based on eleven parameters adapted from the UN E-Government Development Index (UN-EGDI) framework, covering aspects of information availability, service functionality, and interactivity.

Table 3. Descriptive Statistics of Village Website Quality Scores (n = 285)

Statistic	Score Value (out of 11)	Village
Average Score	4.63	
Highest Score	10	Sokawera, Somagede Sub-district
Lowest Score	1	Sawangan, Ajibarang Sub-district, 14 village total

Overall, the average functional quality score of village websites in Banyumas Regency is 4.63 out of a maximum of 11 points. The highest score (10) was achieved by Desa Sokawera, located in Somagede Sub-district, indicating a more advanced level of functional service delivery compared to another village.

On the other hand, 14 villages (4.91% of active websites) recorded a total score of 1, indicating that although these villages possess an active website, they do not yet provide any functional digital services beyond the mere existence of the site itself. In these cases, parameters P2 through P11 remain unfulfilled, reflecting a minimal level of digital functionality.

The fulfillment percentage of each parameter was evaluated to identify the common strengths and weaknesses of the village websites in terms of functional performance and service delivery.

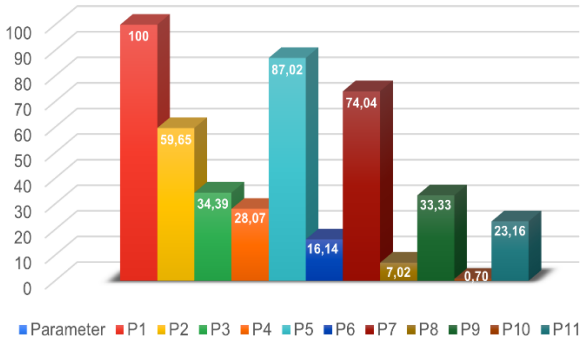

Fig 2. Fulfilment Percentage of Village Website Quality Parameters (n = 285)

The assessment of the 285 active village websites reveals clear variation in how well each functional parameter has been implemented. Some essential components of online presence are already widely adopted, while others remain significantly limited.

The most frequently fulfilled parameters include:

1. P1 – Active and Accessible Official Website (100%)
2. P5 – Website Accessibility and Functional Navigation (87.02%)
3. P7 – Interactive Communication Channels (74.04%)

These figures suggest that the majority of villages are able to maintain functional websites, ensure basic usability, and provide at least a minimal channel for citizens to communicate with village administrators.

In contrast, the least fulfilled parameters are:

1. P10 – Policy Participation Support (0.70%)
2. P8 – Online Administrative Services (7.02%)
3. P6 – Availability of Downloadable Public Documents (16.14%)

To better illustrate the contrast between basic information provision and more advanced service capabilities, the eleven parameters were grouped according to their corresponding maturity levels. Table 4 presents the average fulfillment percentage for each stage of the UN e-government model.

Table 4. Percentage of Maturity Levels

Maturity Level	Related Parameters	%
Availability	P1	100
Level 1: Emerging Presence	P2, P3, P4	40.70
Level 2: Enhanced Presence	P5, P6	51.71
Level 3: Transactional Presence	P7, P8	40.52
Level 4: Connected Presence	P9, P10, P11	19.06

Table 4 summarizes the maturity level distribution of the village websites. The results indicate a clear decline in fulfillment from the foundational stages (Availability and Level 1) to the more advanced stages (Levels 2, 3, and 4), underscoring the gap in functional quality. This indicates that digital service delivery at the village level remains far from achieving the capability to support online public transactions or to encourage meaningful community participation through the website platform.

A broader pattern also emerges parameters corresponding to the early stages of the UN Online Service Index (OSI) maturity model—such as information provision and basic functionality—demonstrate relatively stronger performance. In contrast, those related to transactional services and connected governance remain largely underdeveloped. In summary, while most villages have successfully established an online presence, progress toward more advanced and integrated digital public services remains limited and requires substantial improvement to achieve higher levels of e-government maturity.

D. Comparison of Quality Scores by Management Category

A further analysis was conducted to compare the average functional quality scores between independently managed village websites Independent (Desa Mandiri) and those integrated into the regency-level portal Integrated (*Desa Terintegrasi*). The comparison results are summarized in Table 5.

Table 5. Average Score

Category	Number of Websites	Average Score
Independent	278	4.69
Integrated	7	2.28

V. DISCUSSION

The findings reveal a contrasting condition regarding village-level e-government in Banyumas Regency. Although the adoption rate of village websites is relatively high, it is not accompanied by adequate functional quality. Manual and in-depth assessments indicate that the overall performance remains relatively low. This chapter further discusses the underlying meaning and causes behind this gap, as well as its implications for future development and improvement of village digitalization initiatives.

A. Nearly Comprehensive Adoption (Quantitative Succes with Caveats)

The most notable finding of this study is the remarkably high adoption rate of village websites across Banyumas Regency, reaching 96.0%. This figure represents a tangible achievement of the local government's efforts to promote a digital presence at the village level. From a statistical perspective, the village digitalization program can be regarded as widely and evenly adopted. This achievement serves as a solid foundation for advancing village-level e-government development in the future.

However, this achievement needs to be viewed critically. The existence of villages that still lack an official website indicates that digital access has not yet been fully equitable. Although the number is small only 12 villages (4.0%) this issue should still be considered as an important subject of evaluation. Table 2, which presents the village website adoption rate by sub-district, shows a concentration of lower adoption in several specific areas, such as Kalibagor, Ajibarang, and Pekuncen. These sub-districts require particular attention. More importantly, the high adoption rate does not necessarily align with the functional quality of the websites, which will be discussed in the following section.

B. The Paradox of High Adoption but Low Utilization.

The most significant contrast in this study lies in the gap between the high adoption rate (96.0%) and the average functional quality score of only 4.63 out of 11. A closer examination revealed that most village websites were built using pre-designed templates that were inherently well-structured and equipped with functional features ranging from P2 to P11. However, the findings strongly illustrate a phenomenon of "mere ownership"—a condition where websites exist only for formality without substantive utilization. This indicates that although many villages already possess official websites, they have not used them optimally [3][11].

Although the potential features already exist in the template, their actual utilization remains very limited. The low percentages of several parameters—Document Download (P6) at 16.14%, Online Administrative Services (P8) at 7.02%, and External Connectivity (P11) at 23.16% are not caused merely by the absence of technical features. Rather, these functions were not activated, lacked content updates, or were not managed sustainably by the respective village administrations. These findings strongly illustrate a phenomenon of "mere ownership" or formality without substantive utilization. This indicates that many villages already have well—equipped websites with complete features, yet they have not utilized them optimally.

Furthermore, the low fulfillment scores for the Policy Participation parameter (P10) and External Connectivity (P11) indicate that village websites have not yet been utilized as platforms for citizen participation or as information bridges to other government portals. Consequently, most villages in Banyumas Regency remain trapped at Levels 1 and 2 of the UN E-Government Maturity Framework and have not yet been able to transition to Level 3 (Transactional) or Level 4 (Connected).

The "mere ownership" phenomenon is further reinforced by the finding that 14 villages (4.91% of active websites) scored only 1 point. This means that these websites exist and are technically active, yet they completely lack content and other basic functions. The presence of this minority group indicates that some villages still perceive website ownership and implementation as a formality without substantive value. This situation aligns with common concerns regarding e-government implementation in developing countries, where the focus tends to be on initial infrastructure development rather than on the sustainability of management and long-term utilization. The limited number of human resources, the lack of understanding of the website's role, and budget constraints for maintenance are indicated as the main factors behind the low functional quality observed [5].

C. Dualism of Implementation.

In this section, the researcher examines the implications and management aspects of the implementation model. The Independent Village group achieved an average score of 4.7, generally indicating a higher level of functional quality compared to the Integrated Village group, which recorded an average of 2.3. This difference is most likely attributed to the inherent advantages of the default templates used by independent villages, which offer more complete features compared to the centralized platform, which tends to be simpler [13].

The sharp variation in scores within the Independent Village group—from 1 to 10—is highly significant. This indicates that although the websites share similar templates, the levels of management and utilization vary greatly among villages. On the other hand, the Integrated model offers guaranteed minimum standards and periodic technical maintenance, even though its overall scores remain low. The low scores may be attributed to the limitations of the centralized platform, which does not yet support more diverse and innovative development. This limitation affects the ability to customize the platform according to local or village-specific needs.

VI. CONCLUSION

This study was conducted to analyze the level of adoption and maturity of e-government in village government websites across Banyumas Regency. The analysis employed 11 parameters adapted from the United Nations framework and relevant previous studies. Based on numerical analysis of 297 villages and manual observations of 285 active websites, several conclusions were obtained as follows:

1. The adoption rate of village websites in Banyumas Regency is remarkably high, reaching 96.0%, and can be considered nearly universal. However, 4.0% of villages still lack official websites, indicating that a small portion of villages remain behind in terms of technological readiness and online access.
2. Although the adoption rate is high, the maturity level of village websites in terms of functionality remains at the most basic stages—Emerging and, in some cases, Enhanced Presence. The majority of village websites have not yet been optimally utilized as platforms for interactive public services or citizen participation. This is evidenced by the average functional quality score of only 4.63 out of 11 parameters, along with the low fulfillment of criteria at Level 3 (Transactional) and Level 4 (Connected). This condition reflects the so-called "mere existence" phenomenon, meaning that development efforts still focus more on the presence of the platform itself rather than on the actual functions intended to serve citizens.
3. There are two website management models identified in this study: the independent model (97.5%) using the desa.id domain, and the Integrated model (2.5%) using subdomains under the Regency's official website. Each model has its own strengths and weaknesses. The majority of independent models use standardized templates that include a complete set of features; however, the actual utilization of these features remains very limited. The wide score variation within the independent group—from 1 to 10—indicates that the commitment and competence of village human resources play a crucial role. This decentralized model tends to encourage innovation and quality improvement, allowing adaptation to local village conditions. Conversely, the integrated model provides better standardization and sustainable technical support, although it offers less flexibility for innovation.

Based on the strategic recommendations for the Banyumas Regency Government and Village Administrations:

1. Prioritize improving the quality and utilization of village websites. The focus should be on enhancing quality to align with the already high adoption rate, which has reached nearly 96%. A minimum functional quality standard should be established as a mandatory benchmark for every village website.
2. Strengthen human resource capacity. The findings indicate that the availability of well-designed and feature-rich platforms does not guarantee high quality if they are not properly managed. Therefore, human resource development becomes the most critical recommendation. Training and technical assistance programs should be conducted continuously and sustainably, not merely as one-time or initial activities [14].
3. Conduct regular evaluation and monitoring. The Regency Government should periodically monitor and evaluate the functional quality of village

websites using clear and measurable parameters to ensure consistent improvement over time.

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