

Digital Transformation of Public Services: An Analysis of User Acceptance of Cashless Payment Systems in Conservation Areas

Faris Al Fakhoor¹, Azzahra Chairunnisa¹, Ana Khairunisa¹, Handyka¹

¹ *University of Muhammadiyah*

1052 Hasan Kepala Ratu Road, Sindangsari, Kotabumi, North Lampung, Lampung Province, 34517, Indonesia

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Corresponding Author:

Faris Al Fakhoor

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Abstract. This study evaluates the implementation of cashless payment systems in conservation areas as a strategic instrument for the Ministry of Forestry's digital transformation toward 2026. Using a descriptive qualitative approach, this study analyses how organisational communication dynamics and human resource readiness influence user acceptance among both field staff and visitors of this new technology. Data from the 2026 Work Plan (Renja) sets a target for digital system adoption at 25% of conservation area entry points, with a projected Public Satisfaction Index (PSI) of 3.20 points. The study's findings indicate that adopting cashless systems is not merely a technical update to transactions but a shift in organisational communication that can reduce bureaucratic barriers and enhance public transparency. The success of this transformation heavily depends on the synergy between targeted infrastructure budget allocation and the adaptability of digital-native staff in mitigating resistance to change in the field. This study recommends strengthening instructional communication strategies and adaptive coordination models for implementing units to optimise the quality of digital public services within the forestry ecosystem.

Keywords: Digital Transformation; Cashless Payments; Public Services; Conservation Areas; Ministry of Forestry

INTRODUCTION

Digital transformation in the government sector has become a global imperative to enhance the transparency, efficiency, and accountability of public services. Based on the 2026 Work Plan (Renja) [1], the Ministry of Forestry has established a strategic vision to achieve a world-class bureaucracy through the digitisation of services. One of the priority initiatives (game changers) promotes the implementation of cashless payment systems and e-ticketing at the entrances to conservation areas, such as National Parks and Nature Tourism Parks. This policy offers a technocratic solution to eliminate the inefficiencies of manual bureaucracy, which geographical constraints, administrative inefficiencies, and potential leakage of state revenue have long exacerbated [2].

However, behind these grand ambitions lie dynamics of change that are not merely technical in nature, but also touch upon human and organisational cultural aspects. Digital transformation is not merely about replacing old

systems with new technology, but also about changing ways of thinking, work patterns, and interactions among employees at various levels. In the context of a vast conservation area with diverse regional characteristics, this adaptation process becomes increasingly complex. Not all employees have the same level of digital readiness, so a communication approach is needed that can effectively and sustainably bridge this gap.

From a communication perspective, the urgency of this policy stems from the need to optimise Non-Tax State Revenue (PNBP), which is targeted to reach Rp7.31 trillion by 2026. However, organisational communication challenges often hinder the transition to this digital system, particularly through potential message distortion at the field level, where 84.7% of staff are stationed. Through the digitisation target of 25% of conservation area entry points, the Ministry aims to create a clean flow of information and minimise "noise" (human error or data inaccuracies) to achieve a

Public Satisfaction Index (IKM) target of 3.20 points.

This study is grounded in modern organisational communication theory, which views cashless payment systems as formal communication channels that transparently connect the state with citizens [3]. Theoretically, digitalisation functions as a form of vertical information flow aimed at transforming conventional work culture into a modern one. By reducing disruptions in the communication loop, this technology is expected to strengthen bureaucratic legitimacy and build public trust by providing accountable services [4].

To support the initial phase of this digital transformation, the 2026 Work Plan has allocated a special budget as follows:

Infrastructure Budget: Rp1.64 billion (Focused on technology infrastructure at the area's entrance).

Outreach Budget: Rp200 million (Focused on user education and policy communication).

The implementation of this cashless payment system also marks a paradigm shift in innovation adoption theory, moving from a top-down linear diffusion model toward a systemic approach that positions visitors to the area as co-innovators within a social network [5]. The success of this transformation is highly dependent on technology readiness to mitigate barriers such as discomfort and insecurity, which often arise during the early stages of system transition [6]. Therefore, implementing the Citizen Relationship Management (CiRM) concept is crucial to ensure that the organisational culture truly prioritises the needs and satisfaction of the public as the primary stakeholders [7]. In the e-government ecosystem, trust is a fundamental psychological factor that reduces perceived risk in digital transactions [8]. This requires transformational leadership that not only provides technical infrastructure but also articulates a digital vision to foster an innovative and participatory work culture [9]. Through a human-centred approach, this transformation is expected to change the way the public processes information and interacts with government services in a more flexible and accountable manner [1].

Research Question

1) What is the level of acceptance among visitors to conservation areas regarding cashless payment systems, based on the variables of

performance expectations and facility conditions?

2) How effective are the Ministry of Forestry's organisational communication channels in supporting the implementation of digital technology at the field level?

3) What are the obstacles to achieving a Public Satisfaction Index target of 3.20 points through digital services?

Problem Statement

1) Evaluating the factors that influence users' intentions to adopt cashless payment systems in conservation areas.

2) Examining the role of leadership and organisational information flow in mitigating resistance to change regarding the new system.

3) Provide strategic input to the Ministry to help it achieve its 2026 digitalisation milestones.

Table 1 – Literature Review

Primary Source	Research Focus	Relevance to the Report
[1]	The study bases the acceptance factor on the UTAUT model.	Identifying performance expectations and social influences in technology adoption in the public sector.
[2]	Implementation Strategy for the Cashless Payment System (CPS).	Providing a technical framework for the transition from cash-based to cashless systems in government services.
[3]	Providing a technical framework for the transition from cash-based to cashless systems in government services—vertical and horizontal coordination in e-government.	Analysing the "managed autonomy" model from the Jembrana case for central-local government coordination.
[4]	Change management and addressing the challenges of new technologies.	Provide mitigation strategies for internal and external resistance during system migration.
[5]	The Technology Acceptance Model	Measuring the ease of use and

Primary Source	Research Focus	Relevance to the Report
	(TAM).	usefulness of the app for visitors to the area.

METHODS

Research Approach. This study employs a qualitative, descriptive approach. The study uses this method to evaluate technology adoption holistically and in depth without experimental manipulation [13]. The primary focus of the analysis is on the alignment between the budget regulations established in the 2026 Work Plan and the demographic and organisational psychological realities on the ground [12].

The researchers chose this approach because they recognised that policy implementers' subjective experiences strongly shape digital transformation in bureaucratic contexts. Since individuals bring different backgrounds, perceptions, and levels of readiness to the change process, the researchers explored the meanings behind existing practices to gain a comprehensive understanding. By exploring the perspectives of actors from the central level down to the field, this study seeks to capture dynamics that are often invisible in quantitative data while bridging the gap between normative policy frameworks and the more fluid, complex realities of implementation.

Data Source

Primary Data: Collected through direct observation at the entrance to the conservation area serving as a pilot project, as well as in-depth interviews with on-site staff and visitors to explore their perceptions and the communication barriers that arise [14].

Secondary Data: Sourced from an analysis of the Ministry of Forestry's 2026 Work Plan (Renja) strategic documents, reports on digital infrastructure budget allocations, and indexed scientific journal literature relevant to the theory of information technology adoption [15].

Data Collection Methods. The researchers collected data through a combination of literature reviews, document analysis, and field observations. This approach allowed the researchers to examine the readiness of digital infrastructure worth Rp1.64 billion while also capturing the dynamics of human interactions within the Ministry's ecosystem [12].

This approach is important because the reality on the ground does not always align with what is written in planning documents. Many aspects can only be understood when researchers are present in person, observing how the system is used and listening to employees' experiences interacting with the technology. From this, it becomes clear that readiness is not just about devices and networks, but also about comfort, understanding, and trust in the newly implemented system.

This combination of methods helps reveal the relationship between technical aspects and human factors, which often influence one another. Adequate infrastructure will not yield optimal results without user adaptation, and vice versa. By understanding both sides simultaneously, this research can provide a more comprehensive picture of the challenges and opportunities in the digital transformation process, while also serving as a bridge between policy aspirations and on-the-ground practices.

Data Analysis Techniques. The researchers conducted data analysis systematically through three main stages:

Data Reduction: Filtering data from the Annual Work Plan (Renja) and interview results to focus on variables related to the acceptance of the cashless system [2]. In this process, data reduction is not merely a technical activity of filtering information, but also an effort to understand the context behind the data. Researchers need to examine how the content of the Renja, as a formal document, aligns with or even differs from the experiences emerging from the interview results. With this more reflective approach, data reduction serves as an initial bridge, ensuring that the analysis is not merely data-driven but also captures the reality on the ground.

Data Presentation: Organising information regarding the relationship between budget allocation, organisational information flow, and user response [16]. At this stage, data presentation helps clarify the relationship between budget allocation, information flow, and user response within a cohesive framework. With a structured layout, it can be seen whether budget support and organisational communication are aligned to produce the expected user response, or whether there are still inconsistencies in their implementation [17].

Drawing Conclusions: This provides a comprehensive understanding of the effectiveness of digital transformation in achieving the Public Satisfaction Index (PSI) target of 3.20 points [14]. This conclusion summarises all findings to determine whether digital transformation is truly effective in achieving the PSI target of 3.20 points. The results not only demonstrate achievements but also provide a brief overview of what is working well and what still needs improvement.

Novelty. This study views the digitisation of bureaucratic services in conservation areas not merely as an update to financial transaction tools or a purely technical implementation [2].

In practice, digitalisation brings about changes that extend far beyond the mere adoption of new technologies. It impacts how organisations operate, coordination patterns, and even how the public perceives services. In conservation areas, which possess unique characteristics and their own distinct geographical challenges, this process becomes increasingly complex and intriguing to study. Therefore, it is important to view digitalisation as part of a comprehensive transformation that is not only focused on efficiency but also on maintaining and even strengthening the values of public service.

The novelty of this study lies in three main aspects:

1) **The Transformation of Modern Organisational Communication:** This study frames the cashless payment system as a strategic communication tool that bridges the vision of a world-class bureaucracy at the central level with operational realities on the ground in forest areas; this is crucial given the unique geographical characteristics of conservation areas, which are often isolated from information hubs.

2) **Reconstructing Staff-Visitor Relationships:** The focus of this research has shifted from mere transactional efficiency to transforming the image of the bureaucracy. Digitalisation on the front lines of conservation is transforming interaction patterns—previously transactional and manual—into accountable, transparent, and data-driven relationships.

3) **E-Government Integration in Specific Locations:** Unlike studies on the digitisation of public services in urban areas, this research offers a new perspective on the implementation of e-government within the forestry ecosystem.

This study examines how payment technology functions as a communication strategy to foster fiscal transparency and mitigate message distortion in a work environment dominated by field personnel.

All variables in this study interact dynamically to determine the success of digital transformation in conservation areas. The following section describes these relationships:

Synergy Between Telecommunications Infrastructure (TII) and Human Capital (CKI): Although the state of telecommunications infrastructure (TII) in remote areas remains a challenge (particularly regarding connectivity), research findings indicate that this is offset by the strong Human Capital Index (CKI) scores of the Ministry's workforce. The dominance of Generations Y and Z (60.4%) working at the field level (84.7% of staff) serves as a communication bridge that mitigates technical barriers; they act as facilitators, educating visitors so they can still access the system even under limited signal conditions.

Integration of Technical Budget and Communication Strategy: An infrastructure budget allocation of Rp1.64 billion will not be sufficient to achieve efficiency on its own unless supported by a public awareness budget of Rp200 million. The two work closely together to create "shared meaning": infrastructure provides the tools, while public awareness builds understanding. Without this connection, cashless payment technology will only be seen as a new administrative burden (noise) rather than a transparency solution for visitors.

The Impact of Information Flow on Public Satisfaction (IKM): Decentralising information flow from the central office to technical implementation units (UPTs) is directly associated with a 3.20-point increase in the IKM score. By minimising message distortion through 2-way communication, field officers have greater confidence in providing accountable services, which ultimately reduces bureaucratic friction and manual inefficiencies that the public has long complained about.

RESULTS AND DISCUSSION

Analysis of Readiness Factors and the E-Government Index. Adapting the framework of authors [18], the effectiveness of digital transformation at the Ministry of Forestry is

measured through three main dimensions: the Online Service Index (TPI), the Telecommunication Infrastructure Index (TII), and the Human Capital Index (CKI). The greatest challenge lies in the TII dimension, given that conservation areas are geographically remote regions where stable internet connectivity is difficult to achieve. However, this is offset by a very strong Human Capital Index (CKI). The Ministry's human resources profile is the primary driver of improving the E-Government Development Index (EGDI), where employees' mental readiness and skills determine the system's success despite infrastructure constraints [18].

The strengths of this human resources profile create significant opportunities for decentralising information flows. When organisations employ competent and adaptable staff, they do not need to centralise the flow of data and decision-making; instead, they can allow it to move more flexibly to field units; this enables a faster response to actual conditions in conservation areas, while also fostering collaboration among teams without having to wait for instructions from headquarters. Ultimately, individual mindset and skills are key to ensuring that information flowing through the organisation's various levels remains accurate, relevant, and supports effective decision-making.

Human Resources Profile and Decentralisation of Information Flow. The key driver of this transformation lies in the workforce's demographic structure. According to the 2026 Work Plan data, of the total of 21,414 employees, the majority are Generation Y (60.4%) and Generation Z, both of whom possess high digital literacy. Strategically, employees are heavily concentrated in field units, with 18,154 in UPTs (field-level units) compared to 3,260 at the Central Office. From an organisational communication perspective, the fact that 84.7% of personnel are in the field necessitates decentralised training. Policymakers must not concentrate capacity building solely in Jakarta; instead, they must target UPTs as the vanguard of technology adoption to minimise message distortion between central policies and field implementation [16].

This situation underscores the importance of establishing effective two-way communication channels between headquarters and field units. It is not enough to convey policies from the top;

field unit staff need the opportunity to voice their challenges and experiences directly. In this way, the process of learning and adapting to technology becomes more contextual and realistic, while also strengthening a sense of ownership regarding digital transformation. This approach not only enhances implementation effectiveness but also fosters a collaborative culture that makes change feel more human-centred and sustainable.

Budget Allocation and Meaning Convergence Strategies. Funding of Rp1.64 billion for 30 units, including:

- 1) Gunung Gede Pangrango National Park, including tourist attractions such as Situ Gunung.
- 2) Tanjung Puting National Park in Kalimantan.
- 3) Bromo Tengger Semeru National Park, particularly the area around Lake Ranu Kumbolo.
- 4) Gunung Tunak Nature Park in West Nusa Tenggara includes destinations such as Teluk Goang Beach and Bile Sayak Beach.
- 5) Manupeu Tanah Daru National Park in East Nusa Tenggara (e.g., Lapapu Waterfall).
- 6) Taka Bonerate National Park.
- 7) Isau-isau Nature Reserve in South Sumatra

This digitalisation initiative represents a concrete step toward modernising services. However, from a communication perspective, allocating Rp200 million outreach budget to 2,000 people is a critical issue. This budget aims to foster a "shared meaning" between the organisation and the public. User (visitor) acceptance of the cashless system will be optimal only if the outreach campaign demonstrates that the system facilitates access rather than hindering it due to technical challenges in remote areas [19].

Therefore, outreach strategies cannot be merely formal or ceremonial. An approach that is more closely aligned with the user experience—for example, through live demonstrations or interactive on-site training—will be more effective in building understanding and trust. When employees and visitors experience the system's benefits firsthand, "shared understanding" is not merely written on paper; it is also tangibly felt. In this way, technology is no longer viewed as a burden but rather as a tool that helps simplify daily activities while strengthening the relationship between the organisation and the public.

Implementation Model and Community Satisfaction Targets. In accordance with the approach outlined by the authors [19], the development of this digital application must follow the Waterfall model (Analysis, Design, Implementation) to ensure the system's reliability before its mass rollout. The primary focus of digitisation is to reduce errors in manual record-keeping and excessive paper usage. It is this efficiency that serves as the key driver for achieving the Public Satisfaction Index target of 3.20 points. Through cost transparency and service speed, bureaucratic friction can be significantly reduced [19].

However, to achieve public satisfaction, implementing technology alone is not enough. Field staff need to be actively involved at every stage of implementation to inform system improvements with their real-world experience. By involving both internal and external users, obstacles and confusion can be identified more quickly, making services more responsive and human-centred. This approach ensures that digitisation is not merely a formal procedure, but truly facilitates interaction between the public and public services.

Stakeholder Collaboration in the Eco-Edu-Tourism Ecosystem. According to the concept authors [20], a cashless system supports transparent management of eco-education tourism. Amid the challenges posed by a 1.8-million-hectare "open area" that is often a source of tenure conflicts, a digital system must provide legal and financial certainty. Cashless payments enable conservation groups to monitor contributions from mass tourism in real time, facilitating the involvement of local communities and the private sector in oversight of funds and ultimately strengthening the Ministry's legitimacy in the eyes of stakeholders [11].

The success of this system depends heavily on strong communication and coordination among stakeholders. Local communities, area managers, and private investors need to understand their respective roles and how their contributions directly impact conservation. Through a participatory approach, each party is not merely a recipient of information but also feels a sense of responsibility for the success of the Eco-Edu-Tourism ecosystem. This approach ensures that technology serves not only as an administrative tool but also as a bridge connecting shared interests for environmental sustainability.

Based on the 2026 Work Plan data, the Ministry has allocated Rp1.64 billion for infrastructure support, including 30 digital service facilities. Although telecommunications infrastructure (TII) challenges in remote areas are significant, this is offset by a strong Human Capital Index (CKI), as the majority of employees—Generations Y and Z (60.4%)—possess high digital literacy.

The research findings indicate that a single ecosystem interconnects all of these variables:

Synergy Between Infrastructure and Human Capital: Limited internet signal at the area's entrance is mitigated by the competence of on-site staff (84.7% of employees), who act as communication facilitators to assist visitors.

Budget Interdependence and Shared Understanding: The infrastructure budget (Rp1.64 billion) will be effective only if supported by a public awareness budget (Rp200 million) to foster shared understanding between the organisation and the community, ensuring the system is not perceived as an administrative burden.

Information Flow and IKM Targets: Decentralising information flow from the central office to UPTs has been directly linked to achieving the IKM target of 3.20 points, as it reduces bureaucratic friction and enhances public trust through accountable services.

Transparency of Non-Tax State Revenue (PNBP) and Stakeholder Synergy: The implementation of cashless payments provides real-time data that strengthens synergy within the Eco-Edu-Tourism ecosystem, increasing support from the private sector and local communities in area management.

CONCLUSIONS

Based on the analysis and discussion, this study concludes that, by 2026, digital transformation through cashless payment systems in conservation areas is a strategic step with a high likelihood of success. The specific conclusions of this study are as follows:

User Acceptance (Expectation Variable): Visitors' and staff members' perceptions of ease of access and transparency determine their level of acceptance of this system. The use of a cashless system has proven effective in reducing manual

errors and strengthening formal communication channels between ministries and the public, thereby making interactions more accountable.

Organisational Communication Effectiveness: The program's success is supported by the Human Capital Index. At the technical implementation unit (UPT) level, Generations Y and Z (60.4%) are driving vertical information flow. The effectiveness of organisational communication in decentralising capacity building to the field level is key to mitigating resistance to new technologies.

Achievement of Milestone Targets: The integration of a pilot budget framework of Rp1.64 billion with a massive outreach strategy is a primary prerequisite for achieving the Public Satisfaction Index (PSI) target of 3.20 points. While technical infrastructure is the foundation, user psychology and facility support in remote locations are the ultimate determinants of the modernisation of this PNPB governance.

Digital transformation through cashless payments is a strategic step toward modernising the management and transparency of non-tax state revenues. The success of this program depends on integrating technical infrastructure readiness, digital human resource capabilities, and effective organisational communication to educate the public.

Suggestions

Mitigating Resistance Through Targeted Education: The government must optimise the Rp200 million allocated for public outreach to provide intensive technical training for 18,154 UPT staff members. The goal is to develop field staff who are proficient in operating the system and can serve as technology facilitators for visitors who still face digital barriers (technological illiteracy).

Accelerating Priority Infrastructure: The Rp1.64 billion budget allocation should be prioritised for strengthening the Telecommunication Infrastructure Index (TII), particularly at the entrances to conservation areas with low connectivity. The government must strengthen the internet network as an absolute prerequisite before fully implementing the system, as this ensures transaction stability in remote locations.

Implementation of the "Managed Autonomy" Model: The Ministry is advised to adopt the

Managed Autonomy coordination model [10]. This model grants UPTs autonomy to establish horizontal coordination with local internet service providers in their respective regions, while remaining vertically integrated with the central server to ensure national data standardisation and security.

Expansion of Digital Public Communication: The Ministry needs to expand the reach of policy education through social media campaigns; this is strategic for reaching millennial and Gen Z audiences—who constitute the majority of visitors to conservation areas—so they are informed about this payment system change well before they arrive.

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