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Digital Governance In Practice: Lessons From The Implementation Of SPBE In North Kalimantan

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ABSTRACT

Digital transformation in public administration is an important strategy for the government to enhance efficiency, transparency, and quality of services. The Electronic-Based Government System (SPBE) is designed to promote the integration of bureaucratic processes, yet its implementation still faces serious challenges, particularly in areas with limited digital infrastructure. North Kalimantan Province serves as a contrasting example, where system fragmentation, low digital literacy among civil servants, and institutional limitations result in low effectiveness of SPBE. Furthermore, most previous studies still emphasize technocratic aspects and have not extensively examined how perceptions, emotional responses, and organizational capacity affect the success of digital governance. This research aims to analyze the implementation of SPBE in North Kalimantan through a qualitative approach with a case study. Data were collected through in-depth interviews, document analysis, and observations, and then analyzed using thematic analysis techniques.

The findings indicate that the main obstacles to the SPBE include fragmentation between systems, resistance from state civil apparatus influenced by workload and technostress, as well as low public trust in digital services. This article offers a digital governance model based on the Humans–Machines–Organizations (HMO) approach by incorporating two mediating dimensions, namely Digital Governance Footprint (DGF) and Mental and Emotional Models (MEMOs). This model emphasizes the importance of alignment between human capacity, technological sophistication, and organizational effectiveness, reinforced by user perceptions and emotions. The contribution of this research not only expands the theoretical discourse on digital governance but also provides practical recommendations to accelerate inclusive and sustainable digital transformation in the context of local government.

Keywords: *Digital Governance, The Electronic-Based Government System (SPBE), Public Sector Digital Transformation, Digital Governcane Footprint (DGF), Mental and Emotional Models (MEMOs)*

INTRODUCTION

Digital transformation in public administration has become a central element in contemporary bureaucratic reform. Governments in various countries are increasingly adopting electronic-based systems to enhance efficiency, transparency, and the quality of public services (Ciancarini et al., 2024). Particularly in Indonesia, the Electronic-Based Government System (SPBE) emerges as a national strategy to integrate central and regional government processes through digital platforms, thus creating an adaptive and performance-based bureaucracy (Oluwatosin Abdul-Azeez et al., 2024). More than just technical improvements, digital transformation also requires a change in bureaucratic culture, new leadership patterns, and an increase in human resource capacity (Mulyani, 2024). Therefore, the success of SPBE relies not only on the availability of technology but also on the extent to which data-driven policies and cross-sector collaboration can be internalized into the government ecosystem (Vigoda-Gadot & Mizrahi, 2024).

The implementation of SPBE still faces significant challenges, especially in areas with uneven digital readiness. Several studies have shown that digital initiatives are often hindered by inconsistent

policies, weak system interoperability, and a sharp digital divide between urban and suburban areas (Aguilar Viana, 2021). Similar conditions are clearly evident in North Kalimantan Province, which is relatively new and still faces limitations in digital infrastructure, low digital literacy among civil servants, and fragmented information systems between regional government organizations. This fragmentation leads to duplicate processes, administrative inefficiencies, and ultimately reduces public trust in digital services. Furthermore, the lack of synchronization between central and regional policies also causes fragmentation of digital systems among agencies, thereby hindering data integration and service coordination. The minimal involvement of the private sector and weak information security governance further exacerbate this situation, causing e-Government to tend to operate partially and unsustainably in areas with low digital readiness. This issue indicates the need for a more systemic and adaptive approach in designing a digital governance model that meets local needs.

On the other hand, the effectiveness of digital governance cannot be fully understood from a purely technical perspective. Human perceptions, emotional responses, and institutional capacity are other important factors in shaping the direction of digital transformation (Li & Shang, 2023). Meanwhile, most e-government studies focus on technological advancements. This indicates that there is still little attention given to how digital initiatives are socially perceived and emotionally experienced by civil servants and the public. This technocratic bias risks overlooking important elements such as digital trust, user resistance, and the inclusivity of digital public services (Misuraca & Viscusi, 2014).

Therefore, this study aims to examine the implementation of SPBE in North Kalimantan using the perspective of the Humans–Machines–Organizations (HMO) Integrative Model developed by (Vigoda-Gadot & Mizrahi, 2024). This model emphasizes that the success of digital governance is heavily influenced by the interconnection between human capacity, technology infrastructure, and institutional frameworks. Based on this approach, this research argues that effective digital transformation must also account for two additional mediating dimensions: the Digital Governance Footprint (DGF), which represents the collective perception of stakeholders regarding digital systems, and Mental and Emotional Models (MEMOs), which reflect psychological and emotional responses to technological changes.

This article has two main objectives: (1) to explore the implementation conditions of SPBE in North Kalimantan by highlighting the dimensions of human, technology, and organization; and (2) to formulate a contextual digital governance model by incorporating DGF and MEMOs as mediating variables to accelerate inclusive and sustainable digital transformation in the public sector. Through this approach, the research not only contributes to the enrichment of theoretical studies on digital governance, but also offers practical strategies for policymakers in regions facing limitations in digital readiness.

METHODS

This research uses a qualitative approach with a case study method to deeply examine the implementation of Digital Governance in the SPBE in North Kalimantan Province. The case study focuses on how digital policies, technology, and human resource readiness interact within the digital bureaucracy ecosystem in an area with limited infrastructure and technology literacy (Creswell & Creswell, 2018; Yin, 2016). The research focus is directed at exploring the implementation of the Integrative Digital Governance Model from Vigoda-Gadot & Mizrahi (2024), which emphasizes the importance of the connections between three main elements:

people (civil servants and service users), machines (digital technology), and organizations (government structure). This approach allows for the identification of adaptive and context-specific strategies to address local challenges in digital transformation.
The main objective of this research is to design a Digital Governance model suitable for North Kalimantan through data sources collected from in-depth interviews, policy document analysis, and field observations. Informants were selected based on purposive sampling methods by Patton (2014), consisting of local government officials, civil servants implementing SPBE, representatives from the private sector involved in digital infrastructure development, and the public using digital public services. The analyzed documents include Presidential Regulation No. 95 of 2018, reports on the National SPBE Index, and other policies related to Digital Governance. Field observations focused on direct interactions between civil servants and the community in digital services, as well as the conditions of digital infrastructure in the field.

The data obtained was analyzed using thematic analysis techniques Braun & Clarke (2006), through the processes of data reduction, theme grouping, narrative presentation, and drawing conclusions. To ensure the validity of the findings, a method triangulation technique was employed by comparing the results of interviews, observations, and documents, as well as member checking, which is direct confirmation from key informants regarding the generated data. This analysis process is directed to answer the formulation of the problem and produce a Digital Governance model that is not only theory-based but also contextual to the conditions of infrastructure, organizational culture, and the level of local technology adoption in North Kalimantan.

RESULT

The Digital Governance Condition of SPBE in North Kalimantan

The implementation of SPBE in North Kalimantan shows that the success of digital transformation heavily depends on the synergy among three main components: people (civil servants), technology (digital systems), and organization (government structure and policies). The HMO model developed by Vigoda-Gadot & Mizrahi (2024) emphasizes that the relationship among them should be collaborative, not merely operational. However, in practice, this interaction remains fragmentary. This is due to the lack of comprehensive integration between digital systems, human resource capacity, and government organizational structure. Civil servants in North Kalimantan have been operating various digital applications such as Srikandi, SIMPEG, SIKARA, PESONA, and E-Monev, but their use is still adaptively-partial, not fully integrated across organizations. The lack of system interoperability leads to duplicated work, administrative burdens, and digital fatigue, which ultimately reduces the effectiveness of public services.

Institutionally, many government agencies still rely on external vendors for the development and maintenance of applications, which indicates a limitation in internal capacity to manage digital systems independently. This dependency creates instability in control over the systems and hinders the formation of a participatory digital culture. Meanwhile, from the users' side, many civil servants experience technical and emotional difficulties in adapting, including confusion, frustration, and resistance due to the lack of user-centered training and the absence of policy interventions that are responsive to the experiences and needs of field users.

Table 1. The Condition of the Three Main Pillars of Digital Governance

Main Pillar	Findings	Impact
Digital Capacity of civil servants and the Community	● Civil servants experienced initial resistance due to the perception of additional workload and indirect benefits that are not felt ● The digital literacy of the community is low ● Minimal and unsystematic socialization	● The performance of digital services is not optimal ● Public trust in the system is low ● Digital participation is stagnant
Integration of Inter-Departmental Systems and Applications	● Many applications have overlapping functions ● Data input duplication commonly occurs between different applications ● Dashboards and data are not yet fully connected	● Recurrent administrative burden ● Slow cross-unit service processes ● Inefficient use of systems
Organizational Capacity	● The majority of regional government organization do not have their own IT experts ● There are no incentives or institutional sanctions for the implementation of SPBE ● Not all regional government organization understand that SPBE is a shared responsibility	● Lack of involvement of civil servants in system development ● Long-term dependence on vendors ● SPBE is not sustainable

Source: Researcher's Processed Work (2025)

The limitations of digital capacity, both among civil servants and the community, are a significant barrier to the implementation of e-Government in North Kalimantan. Most civil servants show initial resistance to the digital system, not due to a lack of technical ability, but because of the perception that digital systems add a burden without providing direct benefits. This was expressed by AA from the Regional Personnel Agency of North Kalimantan Province.

"Our main obstacle is user resistance because employees initially rejected it. They are not tech-illiterate, they just find it too troublesome [...] Matters that are not related to welfare, for example, employee data is very difficult to manage". (6/5/2025)

This resistance reflects the emotional barrier that commonly occurs in the digital transformation of the public sector, where employees feel that technology does not directly benefit them personally. This finding is in line with the research by Alcaide–Muñoz et al. (2017), which stated that

bureaucratic resistance to digitization is often more psychological and structural than technical. Meanwhile, the people of North Kalimantan show unpreparedness in utilizing digital services. Many do not understand how to use public service applications and feel there is no clear communication channel when facing issues. This finding refers to the statement made by FU, a local resident.

"We do not fully understand the use of the available applications [...] Socialization and introductions are very rarely conducted, so we are not yet aware of what types of applications there are.". (6/5/2025)

In general, the low public digital literacy hinders citizen participation in the SPBE system. This reinforces the findings of Venkatesh et al. (2012) in the UTAUT model, which states that effort expectancy, or the perception of ease of use, is a key determinant of successful adoption of public technology. In addition, digital systems in North Kalimantan are still fragmented, with many applications having similar functions running in parallel across agencies. This lack of integration leads to work duplication, user confusion, and high administrative burdens. This situation was expressed by FAK from the North Kalimantan Provincial Library and Archives Office.

"In addition to national applications like Srikandi, local governments also continue to use local applications with similar functions. This condition often leads to overlapping use, resulting in one of the applications not being updated regularly or even being neglected." (5/5/2025)

According to Dunleavy et al. (2006), these findings indicate that in many digital-era governance projects, data and system fragmentation is a major obstacle resulting from a lack of a clear system architecture and inter-agency coordination. On the other hand, the findings in this study through the third pillar, which is organizational capacity, also support the findings of Kettunen & Kallio (2021) which state that the success of e-government is greatly influenced by the organization's capacity to manage structural and technological changes simultaneously. This refers to the finding that the majority of regional government organizations do not have competent internal human resources in the IT field, thus relying entirely on external vendors. In addition, there are currently no reward or sanction mechanisms that encourage regional government organizations to optimally implement electronic-based government systems.

Meanwhile, when examining human and technology interactions in SPBE in North Kalimantan, Vigoda-Gadot & Mizrahi (2024) recommend focusing on two main elements, namely the collective perception of the system and the mental and emotional state of system users.

Perception of Digital Governance Footprint (DGF)

In general, the perception of stakeholders towards the digital system footprint in governance shows an imbalance of perception between internal bureaucratic actors and the public. This imbalance illustrates the existence of a perception divide, which is the difference in how the digital system is understood and valued by those operating the system and those using it. Among civil servants, especially those in technical regional apparatus organizations such as the Investment and One Stop Integrated Service Office (DPMPTSP) and the Regional Civil Service Agency (BKD), the digital system is considered to bring ease in carrying out administrative tasks and services. For example, the PESONA and SIPLAKU applications used by PTSP are perceived to be very helpful in the licensing process. This finding refers to one statement from the Director General of DPMPTSP of North Kalimantan Province.

"We can see from each effort how much is reported, then there is a summary from districts/cities to the province. We can do real-time online summaries of incoming investments.". (5/5/2025)

The condition indicates that digitalization in the public sector enhances service efficiency and strengthens the ability of agencies in real-time monitoring and data-driven decision-making. Moreover, the benefits of digital governance directly felt by the apparatus accelerate system adoption, especially when the system is integrated into daily work processes (Chatfield & Reddick, 2017; Mergel et al., 2019). In contrast to the findings above, many citizens perceive e-Government as a system that is less responsive, confusing, and even adds uncertainty to services. This was expressed by S, a local resident.

"The public prefers to come directly to the service office instead of using digital services. This is because the information obtained face-to-face is considered clearer and easier to understand". (6/5/2025)

This condition indicates a significant digital divide between user expectations and system design. The trigger is the limitation of infrastructure and digital literacy, often viewing digital systems as an additional burden. The unpreparedness of infrastructure and lack of technical understanding lead the community to trust more in manual services that are more personal and direct. This reinforces the argument that digital transformation without social transformation will create adoption inequalities. This negative perception from the community emphasizes the importance of building digital trust through clear information, quick responses, and direct interactions in public service processes. In addition, the current design of the SPBE system tends to emphasize administrative aspects and data security, while neglecting user comfort and digital inclusion. This results in a design-use mismatch, which is a discrepancy between the system architecture and user experience. In the context of digital government, success is not only determined by a functioning system but also by how much the community feels that the system serves them. Therefore, digital trust must be actively built through public communication, direct assistance services, and community involvement in the service design process.

The adoption of digital services by the community is highly dependent on perceptions of transparency, accountability, and ease of access within the system (Bertot et al., 2010). This situation is exacerbated by the lack of an inclusive approach in the system design. To date, there are no applications that are friendly to vulnerable groups such as disabled individuals or those living in remote areas. Inclusivity is a core principle in the digital transformation of the public sector. According to Misuraca & Viscusi (2014), the failure of e-government to reach vulnerable groups is a major contributing factor to digital exclusion, especially in areas with limited infrastructure and technology literacy. Therefore, although the digital footprint of SPBE in North Kalimantan has begun to take shape within the bureaucracy, the DGF has not yet been fully felt by the community. This perception gap presents a serious challenge that must be addressed with more participatory, communicative, and inclusive strategies. This phenomenon highlights the importance of understanding DGF not just as a technological output, but also as a collective social perception shaped by the experiences and expectations of users.

Mental and Emotional of System Users (MEMOs)

The emotional and mental responses of stakeholders towards the e-Government system in North Kalimantan show various patterns of adaptation. This diversity in adaptation patterns indicates that

not all individuals respond to digital systems in the same way: some are enthusiastic, skeptical, indifferent, or even resistant. This variation is influenced by many factors such as previous experiences, level of digital literacy, organizational support, and perceptions of change. According to civil servants, resistance to digital systems is more psychological than technical. They are not incapable of operating the system, but they feel that using the application adds an administrative burden that is deemed not commensurate with the direct benefits felt. Kim & Kankanhalli (2009) stated that resistance to technology systems in the public sector is often caused by a mismatch between perceptions of workload and perceptions of benefits, which they refer to as cost-benefit imbalance. When users feel that the system does not provide personal or professional added value, emotional resistance arises, even though they are technically capable of using the system. Meanwhile, technical failures of digital systems also become a source of frustration and uncertainty. An example is the disruption of the Srikandi application, which experienced downtime and hacking. This was expressed by FAK from the Provincial Library and Archives Office of North Kalimantan.

"The digital system used by the local government has experienced interruptions (down) and was even hacked by irresponsible parties. This situation resulted in the temporary halt of service processes and administrative activities". (5/5/2025)

According to Ayyagari et al. (2011), this situation creates technostress, which is stress that arises from having to face disruptions in digital systems during daily work routines. This negative experience decreases the motivation of civil servants to rely on digital systems as part of their work processes, especially when there is no quick or responsive technical solution available. Negative emotional responses are also experienced by the public who use digital public services. S, one local member of the community, expressed a feeling of discomfort when the digital system encounters problems and there is no clear assistance channel.

"Some members of the community express hope that services will be conducted manually again. They feel that in the digital system, confusion often arises, especially when facing technical difficulties.." (6/5/2025)

This condition indicates the presence of perceived helplessness, where users feel they have no control over the digital service processes. According to a study conducted by Davis (1989), this condition has a direct impact on the low perceived usefulness and perceived ease of use of government technology. This also explains why most people prefer manual procedures that they consider more certain and familiar. On the other hand, positive responses are generated through appropriate training and guidance. This finding was expressed by the Director General of the Investment Coordinating Board and One-Stop Integrated Service of North Kalimantan Province.

"The local government has organized various training and technical guidance related to the use of digital applications. This activity aims to improve the understanding and skills of the apparatus in operating the system". (5/5/2025)

This finding is consistent with the results of the research by Li & Shang (2023), which indicates that user-centered training programs can significantly reduce technology anxiety and increase user confidence in government digital systems. Furthermore, a long-term orientation towards digital transformation is also beginning to take shape. For example, AA from the Regional Personnel

Agency of North Kalimantan Province mentioned that the digital attendance system is aimed at supporting Work From Anywhere (WFA).

"The long-term goal to be achieved is the implementation of the WFA concept as part of bureaucratic modernization. To support this, an online attendance system has started to be implemented as a first step. This mechanism is expected to enhance the work flexibility of officials while also strengthening discipline and accountability in performance". (6/5/2025)

The statement above indicates that when the long-term benefits of the system can be communicated well, the emotional response of civil servants becomes more positive and proactive. This supports Rogers (1995) technology adoption model which emphasizes that the perception of relative advantage significantly determines the speed of technology adoption in public organizations.

Digital Governance Model SPBE in North Kalimantan

Based on the integrative HMO framework by Vigoda-Gadot & Mizrahi (2024), the digital governance model is adapted to the contextual conditions of the region. This model places civil servants and service users at the center of the digital transformation process, and not merely as implementers of technology. The implementation of technology must consider the mental and emotional readiness of users through the MEMOs approach and the collective perception of the system, namely DGF. Operationally, this model integrates three main pillars. First, strengthening the digital capacity of civil servants and the community through user experience-based training, involvement in application design, and emotional support when facing system changes. Second, integration of systems across agencies and simplification of applications with an emphasis on interoperability, efficient use, and elimination of process duplication to enhance productivity and user convenience. Third, strengthening organizational capacity, including the development of internal resources, structuring digital security architecture, and reducing dependence on third parties in system management.

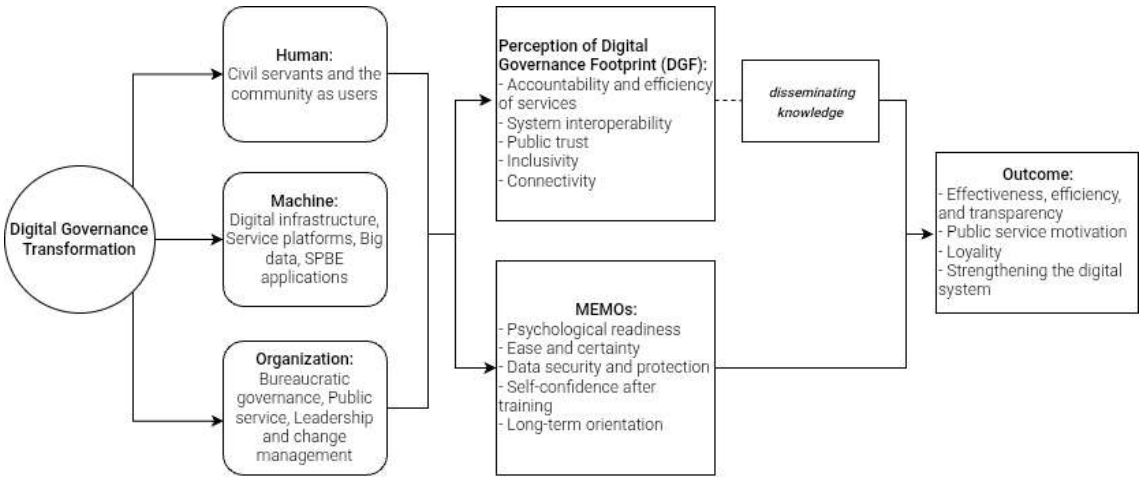

Figure 1. Digital Governance Model SPBE North Kalimantan
Source: Researcher's Processed Work (2025)

The Digital Governance Model in this SPBE is designed to capture the complexity of interactions between three main pillars: humans, technology, and organizations. These three pillars form the foundation of digital transformation in the public sector. Unlike technocratic approaches that only

emphasize systems or policy aspects, this model places human perceptions and experiences as central components through two key elements: DGF and MEMOs. DGF represents the level of understanding, acceptance, and perception of stakeholders towards the presence and value of digital systems. Meanwhile, MEMOs measure psychological and emotional dimensions such as confidence, anxiety, or frustration that arise during the interaction process with technology.

This model also takes into account contextual factors such as local bureaucratic culture, infrastructure readiness, and institutional dynamics that greatly influence human interaction with machines within the framework of public organizations. In the context of North Kalimantan, this model helps explain why the SPBE tends to be fragmentary, meaning that digital systems do exist, but they are not fully accepted, utilized, or emotionally understood by users. Research findings indicate that although digital applications such as SIKARA, PESONA, and SIPLAKU have been used by ASN in various regional government organization, the users' perceptions and emotions towards these applications vary widely, ranging from enthusiastic to skeptical. For example, some ASN feel assisted because the services have become more flexible and efficient, while many also feel burdened due to system duplication and a lack of training. Likewise, on the community side, there is uncertainty in using digital services due to unclear information and the absence of responsive complaint channels.

DGF reflects the collective perceptions of stakeholders regarding the digital system in the bureaucracy, which is ideally achieved through services that are easily accessible, efficient, and can operate across agencies in an integrated manner. A well-designed digital system must be able to build public trust, ensure transparency, and provide equal participation opportunities, including for vulnerable groups. Therefore, the system needs to be not only technically reliable but also socially inclusive and accessible to all regions, including geographically isolated areas.

Meanwhile, MEMOs emphasizes the importance of psychological readiness and the emotional response of users to digital transformation. In ideal conditions, ASN and the community demonstrate an open attitude towards technology, free from frustration, and have access to quick and friendly technical support. A sense of security regarding data protection and system stability is also key to building long-term trust. Furthermore, effective training based on real experiences can enhance self-confidence, strengthen digital literacy, and encourage the emergence of internal motivation to make digitalization an integral part of the work culture. When DGF and MEMOs are in optimal condition, the digital governance system not only operates technically but also grows as a living social system trusted by its users.

The implementation of an integrative and user-oriented digital governance model is expected to yield various strategic achievements, both in terms of institutional context and user experience. Institutionally, the application of a well-managed digital system will strengthen the effectiveness and efficiency of public service processes, minimize administrative burdens, and support faster data-driven decision-making. Furthermore, the openness of the digital system will encourage increased bureaucratic transparency, which is an important foundation for modern government accountability. Through open and responsive digital channels, this model also facilitates broader public participation, allowing citizens to engage in oversight, feedback, and decision-making.

From the user's perspective, an accessible, friendly, and stable system will have a direct impact on increasing public satisfaction with government services. Inclusive digital access and a positive user experience also have the potential to strengthen public trust in state institutions. For Civil Servants,

the implementation of efficient systems that support work flexibility will encourage work motivation and professionalism, while also fostering loyalty to the digital transformation agenda in the public sector. In the long run, this model not only contributes to the achievement of bureaucratic performance but also to the strengthening of digital democracy values, such as access fairness, accountability, and information openness, which are hallmarks of an ideal electronic governance.

Strategy for Accelerating Digital Transformation

The implementation of SPBE in North Kalimantan is still facing significant challenges, especially concerning the three main pillars of digital governance: human capacity, system integration, and institutional strength. These challenges are not only technical and structural but also touch on psychological aspects, perceptions, and emotional responses of users, both civil servants and the public. However, the acceleration of digital transformation in this region cannot be done partially or sectorally. Therefore, an integrative, contextual, and user experience-based acceleration strategy is needed. This acceleration strategy is designed considering the local socio-bureaucratic dynamics, infrastructure limitations, and the emotional conditions of system users. The integrative approach is the unification of institutional interventions, technical support, and cognitive-emotional strengthening. Each strategy is aimed at addressing real issues in the field, arising from in-depth interviews with civil servants, heads of regional work units, and users of digital services.

Table 2. Strategy for Accelerating Digital Transformation in North Kalimantan

Main Pillar	Strategic Issues	Acceleration Strategy	Key Actors
Human Capacity	Low digital literacy	Conducting role-based training and users' psychological response	Regional Personnel Agency, Communication and Information Service, and other technical regional government organization
	Resistance to digital systems	Establishing a digital complaint service	
	Lack of socialization on SPBE	Integrating SPBE utilization indicators into the performance system of civil servants	
System Integration	The inter-regional government organization system is not integrated	Prepare and enforce the SPBE plan map based on an integrated system architecture	Communication and Information Office, Inspectorate, SPBE Coordination Team
	Many overlapping application	Require Single Sign-On (SSO) and a public service dashboard across government agencies	
	Weak coordination between units	Conduct an audit of application systems and stop the development of new redundant applications	

Organizational Capacity	High dependence on vendors	Recruit functional IT personnel through affirmative policies	Department of Communication and Information, Regional Civil Service Agency, and Bureau of Organization
	Absence of internal system development human resources	Require technology transfer in contracts with vendors	
	Weak implementation control mechanisms for SPBE	Implement an incentive system for adaptive regional offices and administrative sanctions for those who neglect	

Source: Researcher's Processed Work (2025)

The first strategy aims to strengthen the digital capacity of government employees and the community. Findings in this study indicate that resistance to digital systems is not due to technical inability, but rather because the systems are considered irrelevant, add administrative burdens, and do not provide direct benefits. Therefore, the training provided must be designed not only technically, but also consider the psychological aspects and the roles of each user, as examined in the MEMOs approach. Meanwhile, community-based digital complaint services can serve as an educational tool that promotes inclusive and sustainable public digital literacy. On the other hand, for government employees, integrating the use of the SPBE into performance systems will enhance a sense of ownership and encourage internal adoption of the system.

The second strategy emphasizes the importance of system integration and the simplification of digital applications among regional government agencies. Based on interview results, it was found that many applications operate redundantly, are not interconnected interoperably, and burden users with repetitive data input processes. Therefore, it is necessary to reorganize the architecture of the SPBE system through the preparation and implementation of the SPBE Roadmap, which includes a framework for system integration and interoperability. The SSO approach and the development of a cross-regional government agencies public service dashboard need to be prioritized so that users, both internal and external, only need to access a single service doorway. Furthermore, periodic audits of application systems become important to prevent the proliferation of redundant applications.

The third strategy concerns strengthening the organizational capacity and human resources of information technology managers. One critical issue in North Kalimantan is the near-total dependence on third-party vendors for the development and maintenance of applications. As a result, government agencies lose control over the systems and lack flexibility in dealing with technical disruptions. This acceleration strategy emphasizes the need to affirmatively recruit IT functional staff, as well as ensuring that every cooperation with vendors is accompanied by a knowledge transfer scheme. Meanwhile, institutional incentives for government agencies that adapt to e-Government systems, along with administrative sanctions for those that neglect the system, can serve as mechanisms to strengthen coordination and accountability.

On the other hand, building public trust and ensuring system stability is an equally important strategic alternative priority. Many residents of North Kalimantan, especially in non-urban areas, claim to trust manual systems more than digital services, which are often unstable and do not provide clear channels for assistance. Therefore, the presence of helpdesks, chatbots, or responsive

digital complaint channels should be part of the SPBE service infrastructure. No less important, the aspect of data security and system resilience against hacking needs to be institutionally enhanced, through strengthening cybersecurity and transparent data governance. Another strategic alternative is to emphasize inclusivity and equitable access to SPBE. Many public service applications have not been designed to reach vulnerable groups such as the disabled, indigenous communities, or citizens in remote areas. The development of application interfaces needs to be based on inclusive design, with accessibility features, multi-language options, and adaptive visuals. To reach areas that do not have stable digital access, it is necessary to initiate a Mobile Unit of Digital Government System, which is a traveling digital service unit based on vehicles that brings devices, connectivity, and human resources to remote villages. Thus, this digital governance acceleration strategy not only targets administrative efficiency but also promotes a digital transformation that is equitable, participatory, and humane. All strategies are designed based on empirical dynamics found in research and supported by theoretical approaches from the integrative HMO model, with DGF and MEMOs as the main mediating elements.

DISCUSSION

The success of the implementation of SPBE in North Kalimantan does not only depend on the availability of infrastructure and formal policy frameworks, but is greatly determined by the degree to which synergy between human, technology, and organizational elements is fully interwoven. This finding reaffirms the validity of the HMO approach by Vigoda-Gadot & Mizrahi (2024), which states that digital transformation in the public sector is a complex socio-technological process, requiring emotional connectivity, collective perception, and institutional integration as the foundation for sustainability.

Empirical conditions show that the fragmentation of inter-organizational systems in regional apparatuses has become a major issue. Many application systems operate separately, leading to process duplication and increased administrative burdens for both civil servants and the service user community. This situation reinforces the criticism by Dunleavy et al. (2006) regarding the era of digitalization in bureaucracy, which is often trapped in a siloed governance model, where systems operate independently without a robust integrative architecture. Additionally, the disparity in perceptions between civil servants and the public further exacerbates the effectiveness of implementation. Civil servants generally view digital systems as tools for internal efficiency, while the public sees them as slow, confusing, and difficult to access. This phenomenon illustrates the existence of a perception gap that hampers widespread adoption.

Meanwhile, based on the perspective of the UTAUT model Venkatesh et al. (2012), the failure of SPBE to bridge user expectations can be explained by weak effort expectancy and inadequate facilitating conditions. The community is reluctant to use digital services because the system is considered not easily accessible and does not provide a clear support channel when problems arise. Many users have expressed that when the system has issues, they do not know who to ask. This condition reflects a high level of desperation.

Resistance also occurs among civil servants, a condition that arises not because of technical incapability, but because the system is perceived to add administrative burdens without providing direct benefits. This finding is in line with the study by Kim & Kankanhalli (2009), which states that resistance to digital systems is often driven by a cost-benefit imbalance, where civil servants feel that their investment of time and energy in using the system is not commensurate with the personal or professional benefits they perceive. Mental fatigue and frustration towards unstable systems, such

as the Srikandi application which was once hacked and experienced downtime, lead to technostress as explained by Ayyagari et al. (2011), when systems do not function properly and there are no responsive solutions, trust in technology decreases drastically.

Nonetheless, the results of this study also show that the right approach can transform negative perceptions and responses into constructive digital experiences. User-centered training has been proven to enhance the confidence of civil servants and strengthen their practical skills in using digital systems. This aligns with the findings of Li & Shang (2023), which indicate that psychologically relevant training can significantly improve public technology adoption, especially in environments with low digital literacy. In addition, the change in the orientation of civil servants towards flexible work such as WFA shows that when long-term benefits are communicated clearly, resistance can be turned into support. Another equally important finding is the weak inclusiveness of the system. Many SPBE applications do not yet support accessibility for vulnerable groups such as persons with disabilities or communities in remote areas. This reinforces the criticism from Misuraca & Viscusi (2014) that the failure of e-government to reach marginal groups is a major cause of digital exclusion, which ironically expands service gaps in a system that should promise equitable access.

Therefore, in order to address these various challenges, the strategy for accelerating digital transformation formulated in this study emphasizes the importance of interventions in three main aspects: human capacity building, system integration and application simplification, and strengthening institutions. This strategy is in line with the public digital transformation model by Kettunen & Kallio (2021), which highlights that the success of digitization can only be achieved if technical changes are accompanied by simultaneous behavioral and organizational structure transformations. A distinctive feature of the proposed strategy is the inclusion of two important elements from the HMO approach, namely DGF and MEMOs as mediation layers. This element not only assesses whether the system functions but also to what extent the system is emotionally experienced and positively perceived by users. This approach also addresses the technocratic bias in many SPBE initiatives and expands the scope of digital transformation from mere efficiency to strengthening the values of digital democracy, such as equitable access, transparency, and citizen participation in governance. Thus, the model and strategies for accelerating digital governance formulated in this research provide significant contributions not only at the practical level but also for the development of a theoretical framework in the study of digital public administration in Indonesia.

CONCLUSION

Digital transformation in public administration through the implementation of SPBE is a national strategy to create a bureaucracy that is adaptive, transparent, and performance-based. However, as indicated in the introduction and reinforced by findings in North Kalimantan, the success of SPBE is not solely determined by the availability of technology, but rather by the integration between people, technology, and organizations within the digital bureaucracy ecosystem. The real challenges faced in North Kalimantan, such as low digital literacy among ASN and the public, fragmentation of systems between OPDs, and weak institutional capacity, indicate the need for an integrative and contextual approach in designing a digital governance model that can address local needs.

Through the HMO model approach and the enhancement of the DGF concept as well as MEMOs from Vigoda-Gadot & Mizrahi (2024), this research formulates a digital governance model for SPBE that emphasizes not only the technical aspects of systems but also places users' perceptions and

emotional experiences as a main component. Disparities in one of the pillars lead to service fragmentation, resistance to technology, and low public participation. This model asserts that an effective SPBE is one that can connect technological logic with the social and psychological realities of its users. Furthermore, this research also proposes strategies to accelerate digital transformation focused on strengthening human capacity through role-based training and user psychology, system integration through a unified SPBE architecture and application audits, as well as strengthening organizational capacity through the recruitment of internal IT human resources and technology transfer schemes. This strategy is strengthened by an inclusive approach that ensures digital services are accessible to vulnerable groups, as well as providing responsive assistance channels for the community. This strategic approach simultaneously supports technical efficiency, improves service quality, and reinforces public trust in digital bureaucracy.

Therefore, the main contribution of this research is to offer a conceptual model and operational strategies that can bridge the gap between the complexities of digitalization and the institutional social readiness at the local level. These models and strategies can be replicated or adapted in other areas with similar characteristics, especially in regions with uneven digital readiness. Furthermore, this research enriches the literature on digital public administration by emphasizing the importance of the interaction between technical and human dimensions in building a democratic, adaptive, and technology-based governance.

REFERENCE

1. Aguilar Viana, A. C. (2021). Transformação digital na administração pública: do governo eletrônico ao governo digital. Revista Eurolatinoamericana de Derecho Administrativo, 8(1), 29–46. https://doi.org/10.14409/redoeda.v8i1.10330
2. Alcaide–Muñoz, L., Rodríguez–Bolívar, M. P., Cobo, M. J., & Herrera–Viedma, E. (2017). Analysing the scientific evolution of e-Government using a science mapping approach. Government Information Quarterly, 34(3), 545–555. https://doi.org/10.1016/j.giq.2017.05.002
3. Ayyagari, Grover, & Purvis. (2011). Technostress: Technological Antecedents and Implications. MIS Quarterly, 35(4), 831–853. https://doi.org/10.2307/41409963
4. Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. Government Information Quarterly, 27(3), 264–271. https://doi.org/10.1016/j.giq.2010.03.001
5. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa
6. Chatfield, A. T., & Reddick, C. G. (2017). A longitudinal cross-sector analysis of open data portal service capability: The case of Australian local governments. Government Information Quarterly, 34(2), 231–243. https://doi.org/10.1016/j.giq.2017.02.004
7. Ciancarini, P., Giancarlo, R., & Grimaudo, G. (2024). Digital Transformation in the Public Administrations: A Guided Tour for Computer Scientists. IEEE Access, 12, 1–30. https://doi.org/10.1109/ACCESS.2024.3363075
8. Creswell, J. W., & Creswell, J. D. (2018). Research Design Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.). Sage Publication, Inc.
9. Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

10. Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). Digital Era Governance: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199296194.001.0001
11. Kettunen, P., & Kallio, J. (2021). E-government and digital governance: A framework for analyzing the challenges of digitalization in public administration. Public Management Review, 23(5), 730–748.
12. Kim, & Kankanhalli. (2009). Investigating User Resistance to Information Systems Implementation: A Status Quo Bias Perspective. MIS Quarterly, 33(3), 567–582. https://doi.org/10.2307/20650309
13. Li, Y., & Shang, H. (2023). How does e-government use affect citizens' trust in government? Empirical evidence from China. Information & Management, 60(7), 1–18. https://doi.org/10.1016/j.im.2023.103844
14. Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. Government Information Quarterly, 36(4), 1–16. https://doi.org/10.1016/j.giq.2019.06.002
15. Misuraca, G., & Viscusi, G. (2014). Is Open Data Enough? International Journal of Electronic Government Research, 10(1), 1–18. https://doi.org/10.4018/ijegr.2014010102
16. Mulyani, S. (2024). Exploring Public Leadership Transformation for Public Service in the Digital Age: A Brief Appraisal. Journal of Governance, 9(4), 806–821. https://doi.org/10.31506/jog.v9i4.30174
17. Oluwatosin Abdul-Azeez, Alexsandra Ogadimma Ihechere, & Courage Idemudia. (2024). Achieving digital transformation in public sector organizations: The impact and solutions of SAP implementations. Computer Science & IT Research Journal, 5(7), 1521–1538. https://doi.org/10.51594/csitrj.v5i7.1273
18. Patton, M. Quinn. (2014). Qualitative research & evaluation methods : integrating theory and practice. SAGE Publications, Inc.
19. Rogers, E. M. . (1995). Diffusion of innovations. Free Press.
20. Venkatesh, Thong, & Xu. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. MIS Quarterly, 36(1), 157–178. https://doi.org/10.2307/41410412
21. Vigoda-Gadot, E., & Mizrahi, S. (2024). The digital governance puzzle: Towards integrative theory of humans, machines, and organizations in public management. Technology in Society, 77, 1–11. https://doi.org/10.1016/j.techsoc.2024.102530
22. Yin, R. K. (2016). Qualitative Research from Start to Finish (2nd ed.). The Guilford Press.