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Digital Culture Shock and ASN Adaptation to Electronic-Based Government Systems: Evidence from West Sulawesi, Indonesia

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ABSTRACT

Digital transformation has become a central strategy in public sector reform, yet its success depends not only on technological implementation but also on the adaptive capacity of Indonesian civil servants (ASN). In Indonesia, the Electronic-Based Government System (EBGS) is intended to enhance efficiency, transparency, and accountability in public administration, thereby contributing to SDG16. However, empirical evidence on how ASN adapt to rapid, policy-driven digitalization remains limited. This study examines ASN adaptation to EBGS by conceptualizing digital transformation as a digital culture shock process informed by Oberg's culture shock theory. Using an exploratory mixed-methods case study design, the study combines a survey of 100 ASN across ten government agencies with in-depth interviews with 15 key informants in West Sulawesi Province, Indonesia. The quantitative findings indicate generally high levels of ASN adaptation across the measured dimensions, although these patterns coexist with recognition of substantial operational challenges. The qualitative findings suggest that adaptation can be interpreted through overlapping themes of acceptance, disruption, recovery, and adjustment within the context of policy-driven digital reform. Taken together, the findings indicate that ASN adaptation constitutes a central explanatory process through which EBGS may be associated with perceived improvements in administrative efficiency, procedural traceability, and confidence in data use. Leadership, organizational culture, and institutional capacity appear as important contextual conditions shaping this process, although they were not formally tested as moderating variables. These findings contribute to the digital governance literature by highlighting human adaptation as a key explanatory dimension of public sector digital transformation. However, the results should be interpreted cautiously, as the study does not test a formal mediation model or causal pathway.

1. INTRODUCTION

Digital transformation has emerged as a central strategic priority in public sector reforms worldwide, driven by increasing demands for efficiency, transparency, and accountability in contemporary governance [1-4]. Governments are now recognized not only as providers of administrative services but also as pivotal actors in digital governance, integrating information technology into planning, decision-making, and public service delivery in a sustainable manner [5]. In the context of global development, the digital transformation of government is regarded as a vital tool for enhancing effective, inclusive, and responsive public institutions, as highlighted in the SDGs, particularly SDG 16 (Peace, Justice, and Strong Institutions) [6].

In Indonesia, the digital transformation agenda in the public sector is guided by the Electronic-Based Government System (EBGS) policy, as set out in Presidential Regulation Number 95 of 2018. EBGS aims to integrate systems, improve data sharing, and raise the quality of public services using information and communication technology. By making public services more efficient, EBGS strengthens transparency, accountability, and the effectiveness of government, contributing to SDG16. International studies place policies like EBGS within the broader move from simple digital upgrades to complete institutional change [2, 7].

Multiple studies show that government digital transformation success depends on more than available technology. The adaptive capacity of human resources is also crucial, especially for public officials who implement policies

[8, 9]. In many developing countries, digitizing bureaucracy brings challenges. These include resistance to change, gaps in digital literacy, and conflicts between traditional work cultures and data- or performance-driven digital systems [7, 10]. This evidence suggests digital transformation is a complex social and cultural process, not just a technical task.

The COVID-19 pandemic significantly accelerated digital transformation in government, forcing rapid adoption of remote work and digital systems. This placed high adaptive pressure on state Indonesian civil servants (ASN), particularly in regions with limited digital capacity. In Indonesia, the accelerated adoption of EBGS during the pandemic drove widespread use of national and regional applications. While EBGS maturity indexes suggest progress, the critical challenge remains ASN's adaptation to these rapid changes, especially in terms of human experience and organizational culture, which are not yet fully understood.

Existing research on e-government and EBGS in Indonesia consistently prioritizes technology adoption, policy evaluation, and institutional readiness through normative and descriptive measures [11-13]. This limited focus fails to address the decisive psychological and cultural factors that shape ASN roles in digital transformation. International studies clearly demonstrate that digital government projects often collapse due to entrenched human and organizational resistance to change, not technical deficiencies [3, 7]. It is therefore imperative to directly investigate how ASN experience, interpret, and adapt to electronic government systems.

The culture shock theory proposed by Kalervo Oberg provides a relevant analytical framework for examining how ASN adapt to digital work environments. Originally developed to explain individual adaptation across cultures, this theory is now frequently applied in studies of organizational change and digital transformation to analyze resistance, learning, and internalization of new systems [10]. The implementation of EBGS marks a transition for ASN from manual-based ways of working to a digital environment, requiring them to embrace new values, norms, and practices centered on speed, transparency, and data-driven accountability.

Digital transformation is a key governance planning instrument in regional development. It shapes governmental work processes, resource allocation, and the development of long-term institutional capacity. The adaptation of ASN to EBGS influences internal bureaucracy performance. It also affects the quality of public services, public trust, and regional competitiveness. Therefore, analyzing ASN adaptation to EBGS is essential for advancing public administration research. It informs sustainable development planning and enhances local governance.

Building on this context, the present study analyzes how ASN adapt to the EBGS at the local government level. The study applies Kalervo Oberg's culture shock theory. Using a mixed methods approach and a case study in West Sulawesi Province, Indonesia, the research examines how ASN navigate digital adaptation stages. It identifies factors that facilitate or impede this process and assesses implications for sustainable governance in line with SDG 16.

2. CONCEPTUAL FRAMEWORK

Digital transformation in the public sector is a complex process that extends beyond the use of new technology [14]. It also brings about major changes to how the government is run, how agencies are organized, and how officials operate [4]. Research says that digitizing government is more than just using computers; it changes how policies are planned, resources are managed, and public services are delivered in the long term [2, 3]. In this context, the EBGS is a digital tool designed to enhance the efficiency, transparency, and reliability of public services.

Digital governance refers to the collaborative use of digital technology to enhance planning, inform decision-making based on data, and facilitate interdepartmental collaboration within the government [1, 2]. In this setting, EBGS is not just a technical system but also a planning tool that shapes how government staff work and affects the ability of local governments. Research indicates that effective digital government projects can enhance the strength of public institutions and support SDG 16 (Peace, Justice, and Strong Institutions) by improving service quality, reducing inefficiency, and fostering public trust [6, 8].

However, various studies confirm that the implementation of e-government and digital government in many developing countries often faces a gap between technological design and the human and organizational capacities of those using it [5]. An overly technocentric approach tends to ignore the human factor, even though ASN are key actors in determining whether digital systems can function effectively in daily bureaucratic practices [15]. Therefore, ASN adaptation is viewed as an important explanatory process that may help account for the relationship between digital policy and governance outcomes.

ASN adaptation is a dynamic process. It involves changes in attitudes, competencies, and work practices as individuals respond to the digital environment. To explain these changes, this text draws on culture shock theory, as proposed by Kalervo Oberg. Oberg argued that adaptation to a new environment goes through stages: honeymoon, crisis, recovery, and adjustment [16]. Contemporary literature often adds a mastery stage. Although devised for cross-cultural settings, this theory now aids in analyzing organizational change and digital transformation. It helps explain resistance, adaptive stress, and learning as people encounter new work systems and norms [10, 17].

Within the context of EBGS, the implementation of digital systems establishes a new work culture for ASN. This transition replaces manual, hierarchical practices with digital processes. These require speed, transparency, and data-driven accountability. Initially, ASN may exhibit enthusiasm for digitalization. This initial excitement is often referred to as the honeymoon phase. It is typically followed by a crisis phase, marked by difficulty and resistance. Causes may include limited digital literacy, heavier workloads, or conflict with existing organizational culture. ASN recover and adjust as they receive training, organizational support, and practical experience. This process helps integrate EBGS into daily work routines. Mastery is achieved when ASN not only use EBGS effectively, but also leverage it to improve public service performance and quality.

To align the conceptual framework more closely with the scope of the empirical analysis, this study adopts a simplified exploratory model centered on three analytically linked elements: EBGS experience, ASN adaptation trajectory, and perceived governance-related effects. In this model, EBGS is treated as the immediate digital reform context in which ASN

operate [10, 18]. At the same time, adaptation is conceptualized as the central process through which respondents interpret and respond to digitally mediated changes in work routines, expectations, and administrative practices.

Drawing on Oberg's culture shock theory, the adaptation trajectory is understood through overlapping themes of acceptance, disruption, recovery, and adjustment. The final element, perceived governance-related effects, refers to respondents' reported perceptions of administrative efficiency, procedural traceability, and confidence in data use. In the present study, this framework is employed as an explanatory and interpretive device rather than as a fully specified causal model. Accordingly, it should be read as a simplified representation of the relationships explored in this case study, not as a formally tested path structure. Leadership, organizational culture, institutional capacity, and SDG 16 are retained in this study as broader interpretive contexts discussed in the narrative analysis. However, they are not treated as formally modeled components of the simplified framework.

3. METHODS

3.1 Research design

The present study employed an exploratory mixed-methods case study design to examine ASN adaptation to the implementation of the EBGS in Indonesia. An exploratory approach was adopted to develop an empirically grounded understanding of adaptation patterns and experiences within a specific regional context, rather than to produce broad population-level generalizations or test a fully specified causal model [7, 19].

A convergent parallel design was employed, wherein quantitative and qualitative data were collected concurrently, analyzed separately, and subsequently integrated through triangulation. In this study, the quantitative component aimed to provide indicative patterns of association within the case, while the qualitative component sought to deepen the interpretation of adaptation experiences and organizational context. Consequently, this study should be regarded as a case-based exploratory inquiry into ASN adaptation under EBGS implementation in West Sulawesi Province [2, 3].

3.2 Study context and units of analysis

West Sulawesi Province, Indonesia, serves as the empirical setting for this study. This regional government has undergone accelerated EBGS implementation, especially after the COVID-19 pandemic. The province provides a pertinent case for analyzing digital governance in developing regions, given its ongoing institutional transformation and the diverse levels of digital capacity among government agencies.

The units of analysis were selected Organisasi Perangkat Daerah (OPDs) that are directly involved in EBGS implementation across key governance domains, such as public administration, development planning, financial management, and public service delivery. This selection aligns with the core components of EBGS architecture and international digital government frameworks [6, 8].

Given the case-based and exploratory nature of the study, the selected OPDs should not be interpreted as providing a statistically representative basis for strong comparative claims across organizational units. Rather, they were included to capture variation in implementation settings within the provincial government and to support an analytically rich understanding of adaptation under EBGS.

3.3 Data collection

3.3.1 Quantitative data

Quantitative data were obtained using a structured questionnaire survey administered to 100 ASN respondents distributed evenly across ten OPDs. A cluster random sampling strategy was employed, designating each OPD as a distinct cluster with an equal number of participants. This method was suitable due to the organizational segmentation of EBGS implementation within local government structures [20].

The quantitative instrument comprised 22 Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree) designed to measure ASN adaptation to EBGS. The items reflected a multi-stage digital culture shock framework, covering initial acceptance and optimism, perceived operational challenges, learning and skill development, adjustment of work practices, and digital mastery and confidence. Because no single established instrument was available for the Indonesian EBGS context, the scale was developed through contextual adaptation from the literature on culture shock, organizational adaptation, and digital transformation in the public sector [10, 21].

3.3.2 Instrument development, adaptation, and validation

The questionnaire used in this study comprised 22 Likert-scale items designed to capture ASN adaptation to EBGS across five conceptual dimensions: initial acceptance and optimism, perceived operational challenges, learning and skill development, adjustment of work practices, and digital mastery and confidence. These items were adapted from the broader literature on culture shock, organizational adaptation, and public-sector digital transformation, with Oberg's culture shock framework serving as the primary theoretical anchor for the staged-adaptation logic. Studies informed the formulation of additional items on organizational change, employee adaptation, and digitalization in government settings.

Given the absence of a single established scale to measure ASN adaptation to EBGS in the Indonesian public sector, the instrument was developed as a contextually adapted measure rather than adopted verbatim from a prior study. The initial English item pool was translated into Indonesian and subsequently reviewed to ensure conceptual equivalence, clarity, and relevance to the administrative context of EBGS implementation. The wording of the items was refined to reflect local bureaucratic terminology and routine digital work practices in regional government institutions. Prior to full deployment, the questionnaire underwent content review to assess face validity, item clarity, and contextual appropriateness.

3.3.3 Qualitative data

Qualitative data were gathered through semi-structured, in-depth interviews with 15 key informants, including senior executives, middle managers, functional officers, and technical staff directly involved in EBGS implementation.

Purposive sampling ensured variety in roles, expertise, and digital responsibilities.

The interviews explored ASN experiences during EBGS implementation, evaluating perceived challenges, stressors, coping methods, organizational support systems, and effects on work practices and service delivery. This qualitative method enabled an in-depth examination of adaptation processes not adequately revealed by survey data alone.

3.4 Data analysis

Descriptive statistics were employed to summarize overall adaptation patterns in the quantitative data, including measures of central tendency and dispersion. All quantitative analyses were conducted using IBM SPSS Statistics, which enabled systematic data cleaning, reliability testing, and statistical modeling. Descriptive statistics were used to summarize the overall adaptation patterns in the quantitative data, including measures of central tendency and dispersion across the five dimensions of ASN adaptation. All quantitative analyses were executed using IBM SPSS Statistics, facilitating systematic data cleaning, reliability assessment, and descriptive profiling of adaptation responses. Consistent with the exploratory case-study design, the quantitative component primarily served to delineate the reported level and internal patterning of ASN adaptation, rather than to estimate a formal multivariable outcome model.

Qualitative interview data were analyzed thematically through systematic coding and theme development, guided by Oberg's culture shock model. This process facilitated the inductive identification of context-specific adaptation dynamics while maintaining theoretical coherence, thereby ensuring a balanced integration of empirical evidence and established conceptual frameworks [22].

It is crucial to acknowledge that the current study does not utilize a formal mediation model, path analysis, structural equation modeling, or a longitudinal design. Consequently, the quantitative analysis aims to identify patterns of association and explanatory relationships rather than to establish a verified mediating mechanism or causal pathway. The qualitative findings were employed to enhance the interpretation of these associations and to evaluate whether the observed patterns align with the theoretically proposed intervening role of ASN adaptation.

In developing the questionnaire as a contextually adapted instrument for this study, particular emphasis was placed on ensuring item clarity and theoretical alignment. Nevertheless, this study did not undertake a comprehensive psychometric validation employing exploratory factor analysis (EFA), confirmatory factor analysis (CFA), composite reliability (CR), or average variance extracted (AVE). Consequently, the quantitative findings should be interpreted as derived from a theoretically informed, contextually adapted measure rather than from a fully validated latent measurement model. Future research should pursue more rigorous scale validation using larger samples and formal measurement-model testing.

Given that the questionnaire relied on self-reported responses collected during a single survey wave, the potential for common-method bias and social desirability bias cannot be entirely ruled out. Furthermore, the items related to "Perceived Operational Challenges" were designed to assess respondents' awareness of system complexity, workload, and procedural burden during EBGS implementation. Consequently, higher scores on this dimension should be interpreted as reflecting stronger perceived challenges rather than a higher level of adaptation in a strictly positive sense. This study did not conduct a formal statistical test for common method bias, such as Harman's single-factor test or marker-variable analysis. Therefore, the quantitative findings should be interpreted with caution, as exploratory patterns within the case rather than as unbiased estimates of association.

3.5 Integration and validity strategies

Quantitative and qualitative findings were integrated using methodological triangulation. This involved comparing statistical results with narrative evidence. The aim was to identify convergence, complementarity, or divergence across data sources. This approach enhanced the robustness of interpretations and led to a comprehensive understanding of ASN adaptation to EBGS as a socio-technical transformation [19].

Several strategies were employed to enhance the trustworthiness and validity of the findings. These included data triangulation across OPDs, member checking with selected interviewees, and transparent documentation of analytical procedures. These practices align with established standards for rigor in mixed-methods and qualitative research [23].

4. RESULT AND DISCUSSION

The results are presented in relation to the simplified exploratory framework shown in Figure 1, which links EBGS experience, ASN adaptation trajectory, and perceived governance-related effects. This framework serves as an interpretive guide for organizing the findings rather than as a formally tested causal model. This framework facilitates a systematic analysis of how digital policy inputs are transformed into institutional performance through human adaptation processes, offering an integrated perspective on the empirical findings.

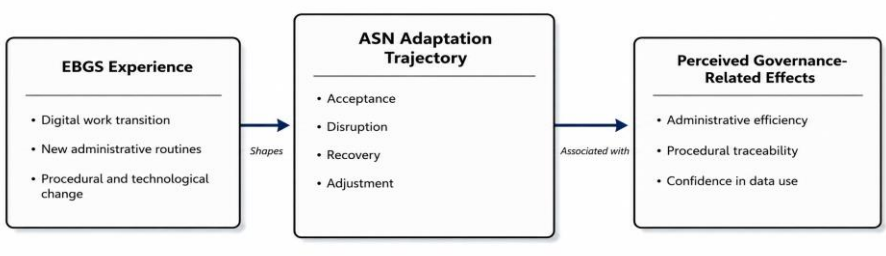

Figure 1. Simplified exploratory framework linking Electronic-Based Government System (EBGS) experience, Indonesian civil servants (ASN) adaptation trajectory, and perceived governance-related effects

Figure 1 shows the simplified exploratory framework of the study. EBGS experience is positioned as the immediate digital reform context; the ASN adaptation trajectory is interpreted through overlapping themes of acceptance, disruption, recovery, and adjustment; and perceived governance-related effects refer to reported implications for administrative efficiency, procedural traceability, and confidence in data use. The framework serves as an explanatory guide for interpreting the case findings rather than as a formally tested causal structure.

4.1 Patterns of Indonesian civil servants digital adaptation under Electronic-Based Government System implementation

The quantitative analysis demonstrates a consistently high level of adaptation among ASN regarding the implementation of the EBGS in West Sulawesi Province. Descriptive statistics reveal that mean scores across all adaptation indicators range from 4.30 to 4.70 on a five-point Likert scale, indicating strong agreement with statements related to acceptance, learning, and the integration of digital systems into routine bureaucratic practices. The relatively low standard deviation values, ranging from 0.49 to 0.67, suggest a high degree of convergence in ASN perceptions across organizational units, indicating that digital adaptation is not limited to specific agencies or functional groups.

The elevated mean values associated with indicators of initial acceptance and optimism suggest that ASN generally perceive EBGS as a beneficial institutional reform. Respondents predominantly concur that digital systems have the potential to streamline administrative procedures, enhance inter-unit coordination, and improve service efficiency. This finding indicates that EBGS has been internalized not merely as a compliance requirement but as a significant component of bureaucratic modernization.

The relatively high mean score for the "Perceived Operational Challenges" dimension warrants careful interpretation regarding its directionality. Unlike the positively framed adaptation-related dimensions, this dimension reflects the extent to which respondents identified system complexity, cognitive burden, and procedural disruption during EBGS implementation. Therefore, its relatively high mean does not necessarily indicate stronger positive adaptation; rather, it signifies a greater recognition of transitional difficulties. The concurrent presence of high scores on both positively framed adaptation dimensions and challenge-related items suggests that ASN were adapting to EBGS while simultaneously encountering significant operational burdens. In this context, adaptation and strain should be viewed as coexisting aspects of policy-driven digital transition, rather than as mutually exclusive conditions.

In summary, the quantitative findings suggest that ASN generally exhibited high levels of adaptation across the assessed dimensions, despite concurrent recognition of significant operational challenges. Within the framework of this exploratory case study, these descriptive findings should be interpreted as reflecting the internal profile of adaptation, rather than as constituting a formal causal or predictive model.

Table 1 provides a comprehensive analysis of adaptation dimensions. Indicators about the adjustment of work practices and the development of learning and skills consistently exhibit high mean values, indicating that ASN have progressed beyond initial exposure to achieve functional integration of digital systems. Conversely, the slightly lower mean score for digital mastery and confidence suggests that while most ASN have adapted to EBGS, the complete optimization and strategic utilization of digital platforms are still underway.

Table 1. Descriptive statistics of Indonesian civil servants (ASN) adaptation to Electronic-Based Government System (EBGS)

Adaptation Dimension	Data
Initial Acceptance and Optimism	4.65 ± 0.52
Perceived Operational Challenges	4.38 ± 0.61
Learning and Skill Development	4.47 ± 0.55
Adjustment of Work Practices	4.58 ± 0.49
Digital Mastery and Confidence	4.32 ± 0.67

Note: Data are presented as Mean ± SD. For the "Perceived Operational Challenges" dimension, higher scores indicate stronger recognition of operational difficulties during EBGS implementation.

The pattern observed in Table 1 suggests that adaptation to EBGS extends beyond initial enthusiasm, encompassing more advanced stages of learning and operational integration. The relatively lower score for digital mastery indicates that adaptation is an ongoing process rather than a completed transition. This finding implies that digital governance reforms should be conceptualized as iterative and cumulative, necessitating sustained capacity development rather than one-time interventions.

Taken together, the descriptive pattern should not be interpreted as uniformly positive experiences across all dimensions. Instead, it indicates that respondents reported both relatively strong adaptation-related orientations and significant operational challenges concurrently. This pattern aligns with qualitative evidence suggesting that EBGS implementation involved simultaneous learning, adjustment, and strain, rather than a straightforward transition from resistance to acceptance.

As shown in Figure 2, the descriptive analysis results show that the level of adaptation of ASN to the implementation of the EBGS is very high across all measured dimensions. The Initial Acceptance and Optimism dimension recorded the highest average score (4.65 ± 0.52), reflecting the positive initial attitudes and optimism of ASN towards the implementation of EBGS. This high initial acceptance can be understood as a result of top-down national policy initiatives, accompanied by narratives of bureaucratic reform and public service modernization. In the context of digital culture shock, this phase represents the honeymoon phase, where individuals display enthusiasm for the new system before fully experiencing the complexities of the changes.

Furthermore, the Adjustment of Work Practices (4.58 ± 0.49) and Learning and Skill Development (4.47 ± 0.55) dimensions also showed high mean scores with relatively low variance. This indicates that ASN not only accept EBGS normatively but are also able to adapt work procedures and develop the skills needed to operate in a digital work environment. This finding strengthens the argument that ASN adaptation is active and ongoing, not simply administrative compliance with digitalization policies.

However, the Perceived Operational Challenges (4.38 ± 0.61) and Digital Mastery and Confidence (4.32 ± 0.67) dimensions showed lower mean scores with larger standard deviations than the other dimensions. This pattern indicates heterogeneity in ASN experiences in facing operational challenges and mastering digital technology. Some ASN have

achieved a high level of confidence in using digital systems, while others still face technical difficulties, limited digital literacy, or obstacles to supporting infrastructure.

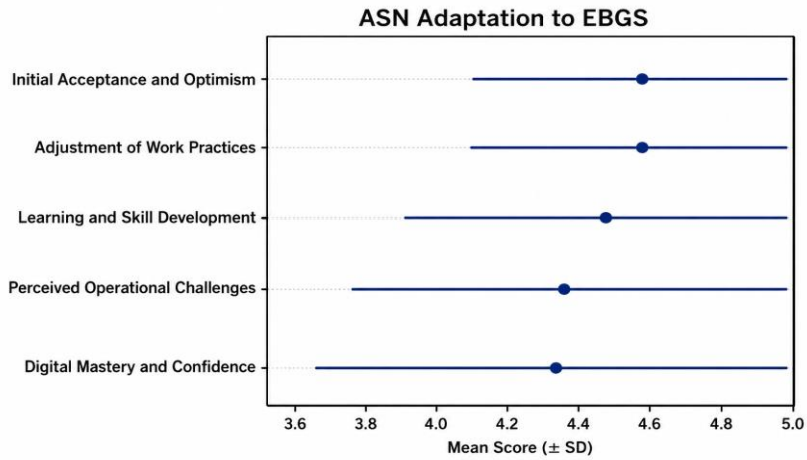

Figure 2. The level of Indonesian civil servants (ASN) adaptation to Electronic-Based Government System (EBGS)

This difference in variation is an important finding within the digital culture shock framework, as it demonstrates that while acceptance and structural adjustments occur relatively quickly, in-depth digital mastery requires time, institutional support, and a more intensive learning process. Thus, digital transformation in the public sector cannot be viewed as a linear process, but rather as a dynamic socio-organizational adaptation involving negotiations between technology, bureaucratic work culture, and the individual capacities of ASN. To deepen the interpretation of the descriptive adaptation patterns identified in the survey, the following section presents qualitative findings on how ASN experienced EBGS implementation in everyday bureaucratic practice.

4.2 Experiential dynamics of Indonesian civil servants adaptation to digital governance

Qualitative findings enhance the comprehension of the adaptation patterns identified in the quantitative analysis by elucidating the experiential, emotional, and organizational dimensions of EBGS implementation. Interview data indicate that ASN perceived EBGS not merely as a technical reform, but as a significant organizational transition that transformed established routines, work identities, and inter-unit interactions. Informants consistently highlighted that digitalization altered the prioritization, documentation, and evaluation of tasks, thereby redefining perceptions of professional competence within the bureaucracy.

The initial phase of EBGS implementation is frequently characterized as a period marked by heightened enthusiasm and optimism. ASN regarded digital systems as emblems of modernization and institutional advancement, particularly in terms of expedited service delivery and enhanced administrative transparency. This optimism was notably pronounced among younger staff members and those with prior exposure to digital tools, who perceived EBGS as an opportunity to align bureaucratic practices with contemporary governance standards. However, this early enthusiasm was largely anticipatory and not yet substantiated by practical experience.

As the implementation advanced, the initial optimism transitioned into a phase marked by confusion, stress, and procedural disruption. Informants reported challenges stemming from fragmented digital platforms, overlapping data entry requirements, and inconsistent system performance. Many ASN experienced cognitive overload as they endeavored to reconcile legacy administrative procedures with newly introduced digital workflows. Senior staff and those with extensive experience in manual systems particularly struggled to adjust to new interfaces and reporting mechanisms, underscoring the influence of generational experience and professional socialization on adaptation trajectories. Notably, this phase did not manifest as ideological resistance to EBGS. Instead, it represented functional resistance rooted in uncertainty, anxiety, and fear of making errors in an unfamiliar digital environment.

A combination of formal institutional interventions and informal organizational practices characterized the recovery phase. Structured training programs facilitated the standardization of fundamental competencies, while peer mentoring and informal knowledge sharing were crucial in translating technical instructions into practical expertise. Informants consistently highlighted that adaptation was expedited when hierarchical boundaries became more permeable, enabling digitally proficient staff to assist colleagues irrespective of rank or position. Leadership support further contributed to restoring confidence by legitimizing learning through trial and error rather than penalizing initial mistakes. This phase signified a transition from individual struggle to collective problem-solving.

Over time, EBGS became increasingly integrated into routine administrative practices, indicating a shift towards adaptation. ASN reported enhanced confidence in managing multiple applications, coordinating tasks across units, and adhering to standardized digital procedures. In several OPDs, this adaptation progressed to a stage of functional mastery, where ASN not only operated EBGS effectively but also began to identify opportunities for process optimization and service quality enhancement. These units demonstrated early signs of digital maturity, including proactive problem-solving, cross-unit collaboration, and a willingness to embrace further innovation.

Significantly, the rate and extent of this progression differed across organizational contexts. Organizations with supportive leadership, collaborative cultures, and environments conducive to continuous learning advanced more swiftly

toward mastery. In contrast, those characterized by rigid hierarchies and limited training opportunities experienced extended periods of uncertainty. This variation underscores the perspective that adaptation to digital governance is influenced as much by organizational context as by individual capability.

Table 2. Thematic patterns of Indonesian civil servants (ASN) digital adaptation to Electronic-Based Government System (EBGS)

Adaptation Phase	Dominant Themes	Illustrative Organizational Dynamics
Initial Acceptance	Optimism, modernization expectations, perceived efficiency gains	High expectations of digital reform, particularly among younger ASN
Crisis and Disruption	Confusion, stress, cognitive overload, functional resistance	Fragmented systems, overlapping procedures, generational gaps
Recovery and Learning	Peer mentoring, training, leadership support	Informal knowledge sharing across hierarchies, trial and error learning
Adjustment and Mastery	Confidence, innovation, digital maturity	Process improvement initiatives, inter-unit collaboration

The thematic patterns outlined in Table 2 indicate that ASN adaptation to EBGS occurs as a staged yet non-linear process, aligning with the Digital Culture Shock framework. Rather than following a uniform progression, ASN experiences fluctuation between challenge and learning, highlighting the iterative nature of organizational digital transformation. This qualitative evidence complements the quantitative findings by illustrating how adaptation processes are implemented in practice and how organizational conditions influence the trajectory from initial exposure to digital mastery.

4.3 Perceived governance-related effects and their relevance to SDG 16

This section presents governance-related implications as interpreted from the integrated findings, especially the qualitative evidence, rather than as the result of a formally specified quantitative outcome model. The findings provide exploratory evidence that successful adaptation may be associated with perceived improvements in administrative efficiency, procedural traceability, and confidence in data use. However, these patterns should be interpreted as governance-related implications reported within the case rather than as broadly generalizable governance outcomes. Both quantitative and qualitative findings consistently demonstrate that the successful adaptation of ASN to digital systems is closely linked to tangible improvements in core governance outcomes. Respondents who exhibited higher levels of adjustment and digital proficiency reported significant gains in administrative efficiency, including faster processing times, reduced procedural redundancies, and enhanced coordination across organizational units.

In addition to efficiency gains, the findings demonstrate significant enhancements in transparency and procedural accountability. ASN reported that the implementation of integrated digital platforms improved the traceability of administrative processes, minimized discretionary practices, and facilitated more precise documentation of decisions and responsibilities. Qualitative evidence further indicates that digital systems promoted greater adherence to standardized procedures, as actions conducted within EBGS environments are more readily monitored and audited. Collectively, these changes indicate a transition toward more rule-based and accountable governance practices.

An essential aspect of governance outcomes pertains to decision-making capacity. Respondents exhibiting higher levels of digital mastery reported enhanced confidence in data-driven decision-making, particularly in the domains of planning, reporting, and performance evaluation. The availability of real-time data and integrated information systems facilitated ASN's transition from reactive administrative practices to more anticipatory and evidence-informed approaches. This transformation was particularly pronounced in OPDs that had advanced to the adjustment and mastery phases of adaptation, where digital tools were no longer viewed as onerous requirements but as strategic resources that support institutional objectives.

The findings suggest variation across organizational settings in how respondents described the implementation and effects of EBGS. In some OPDs, interviewees reported stronger indications of coordination, learning support, and confidence in digital routines, whereas in others the narratives pointed to more persistent uncertainty and operational constraints. Given the exploratory case-study design and limited sample size, these differences should be interpreted as indicative contextual variation rather than as definitive comparative evidence across organizational units. This variation points to the importance of organizational and individual conditions that appear to shape adaptation, rather than to formally tested moderating effects.

Collectively, these findings illustrate that EBGS is associated with governance outcomes not solely through technological deployment, but also through human adaptation processes that play an important intervening role. This conclusion supports the conceptual argument that digital governance reforms are inherently socio-technical, necessitating alignment between systems, organizational practices, and human capacities. Consequently, the results support the conceptual proposition that EBGS implementation, ASN adaptation, and governance outcomes are closely connected through adaptive processes shaped by individual and organizational contexts. However, these findings should be interpreted as explanatory and correlational rather than as conclusive evidence of a causal chain.

From a sustainable development perspective, the governance outcomes observed are closely aligned with the objectives of SDG 16, which focuses on peace, justice, and strong institutions. Enhancements in efficiency, transparency, accountability, and data-driven decision-making directly correspond to the targets of SDG 16, which emphasize the establishment of effective, accountable, and inclusive institutions. The findings indicate that EBGS serves as a viable instrument for promoting sustainable institutional development when integrated within broader governance planning frameworks that prioritize human adaptation and organizational learning.

Significantly, the findings caution against perceiving digital governance initiatives as mere short-term technological solutions. Instead, the alignment with SDG 16 identified in this

study underscores the necessity for long-term investment in adaptive capacity, leadership development, and organizational culture reform. By positioning EBGS within a trajectory of continuous institutional strengthening, digital transformation can serve as a catalyst for sustainable governance rather than a standalone administrative reform.

4.4 Digital culture shock as an explanatory process consistent with an intervening role in digital governance

The strong alignment between the empirical findings and the conceptual framework depicted in Figure 1 offers substantial validation for the proposed model of Digital Culture Shock within the context of public sector digital transformation. The findings suggest that implementing the EBGS should not be perceived as a straightforward, linear process that directly yields governance outcomes. Instead, the evidence indicates that ASN adaptive responses play a crucial role in explaining how EBGS may be linked to governance changes. As this study does not employ a formal mediation model, these findings should be interpreted as indicative of an intervening role for adaptation rather than conclusive evidence of mediation [24, 25].

Qualitative findings indicate that participants' experiences can be effectively interpreted through adaptation-related themes, specifically acceptance, disruption, recovery, and adjustment. In this exploratory case study, these phases should be regarded as an analytical interpretation of interview narratives rather than a definitive stage model applicable across various contexts. Nevertheless, the manifestation of these stages within a bureaucratic digitalization context diverges significantly from traditional cross-cultural transitions. Notably, the stages are observed to be compressed, overlapping, and frequently iterative rather than sequential. This pattern reflects the unique institutional pressures associated with policy-driven digitalization, where adaptation is not voluntary but mandated through regulatory frameworks and organizational directives [26].

In contrast to cross-cultural migration, where individuals may gradually acclimate to new environments, the implementation of EBGS necessitated that ASN swiftly abandon long-established manual routines and professional norms [27]. This transition was further exacerbated by external shocks, most notably the COVID-19 pandemic, which accelerated the pace of digital adoption and diminished opportunities for gradual learning. Consequently, ASN frequently experienced concurrent feelings of optimism and disruption, learning and resistance, indicative of a form of compressed adaptation unique to digitally mediated governance reforms. Similar dynamics have been documented in recent studies of digitally induced organizational change within the public sector, which highlight non-linear adaptation trajectories under conditions of institutional urgency [26].

This study advances digital governance theory by conceptualizing ASN adaptation as an explanatory process that plays an intervening role, thereby moving beyond prevalent technology-centric models. Frameworks such as the Technology Acceptance Model [28]. These models often abstract technology adoption from its broader organizational and cultural context, consequently underestimating the significance of emotional disorientation, identity renegotiation, and collective learning processes that are integral to bureaucratic digitalization [29].

The Digital Culture Shock framework addresses this limitation by integrating behavioral, organizational, and cultural dimensions into a unified explanatory model. It elucidates how ASN perceive digital reforms not merely as technical instruments but also as challenges to established professional identities, authority structures, and accountability norms. In doing so, the framework aligns with emerging scholarship advocating for more holistic and process-oriented approaches to studying digital government transformation, emphasizing adaptation, sensemaking, and institutional learning as central analytical constructs [2, 18].

Positioning Digital Culture Shock as an explanatory intervening process helps elucidate why similar digital policies may yield divergent governance outcomes across organizational contexts. In environments where adaptive capacities are bolstered by leadership, learning infrastructures, and collaborative cultures, the disruptive effects of digital shock are more swiftly converted into productive learning processes. Conversely, in contexts where such supports are deficient, digital shock may persist as organizational strain, thereby constraining the realization of governance benefits. This insight highlights the theoretical significance of Digital Culture Shock as a conduit between policy inputs and institutional performance, offering a more nuanced comprehension of digital governance dynamics than static adoption models.

4.5 Adaptive governance, institutional capacity, and SDG 16

The findings of this study further elucidate that the EBGS operates most effectively when integrated as a fundamental component of governance planning, rather than as an isolated technological reform. Empirical evidence indicates that ASN adaptation serves as the pivotal mechanism through which digital policy objectives are translated into tangible operational enhancements, including improved administrative efficiency, increased transparency, and reinforced procedural accountability. This finding corroborates a growing consensus in the digital government literature that technological infrastructure alone is inadequate to generate governance value without concurrent investments in organizational learning and institutional capacity [18, 26].

The findings suggest that adaptive governance significantly influences the trajectory of digital transformation within organizational units. Adaptive governance, defined as the ability of institutions to learn, adapt, and reconfigure practices in response to systemic changes, emerged as a crucial explanatory framework for understanding variations in EBGS outcomes. Organizational units characterized by proactive leadership, collaborative cultures, and environments that foster continuous learning advanced more swiftly from initial disruption to adjustment and digital mastery. In these settings, EBGS was internalized not merely as a compliance mechanism but as a strategic resource for enhancing coordination, performance monitoring, and service delivery [4].

Conversely, organizational units characterized by rigid hierarchical structures and limited opportunities for learning experienced extended crisis phases, marked by uncertainty, procedural bottlenecks, and slower integration of digital systems. These findings challenge deterministic assumptions that digital transformation outcomes are driven primarily by system design or technological sophistication. Instead, they underscore the importance of contextual sensitivity in policy

implementation, where leadership practices, organizational norms, and institutional readiness mediate the effects of digital reforms [8]. This observation aligns with adaptive governance theory, which emphasizes iterative learning, feedback mechanisms, and institutional flexibility as prerequisites for navigating complex policy environments.

Institutional capacity has emerged as a pivotal determinant of governance outcomes [5]. The ability of OPDs to effectively mobilize human resources, sustain training programs, and institutionalize knowledge sharing has significantly influenced the depth and durability of digital adaptation [15]. In contexts where institutional capacity is robust, EBGS has facilitated a transition from reactive administrative practices to more anticipatory and data-driven governance [4]. ASN within these units have reported increased confidence in evidence-based decision-making, cross-unit coordination, and performance evaluation, indicating a shift towards more mature governance practices.

From a sustainable development perspective, the governance outcomes associated with successful adaptation demonstrate a strong alignment with the objectives of SDG 16, which emphasizes the establishment of effective, accountable, and transparent institutions. Enhancements in administrative efficiency, procedural traceability, and accountability mechanisms observed in this study directly correspond to SDG 16 targets related to institutional effectiveness and public trust [6]. Notably, the findings indicate that EBGS contributes to sustainable institutional strengthening only when integrated within long-term strategies for capacity building and organizational reform, rather than being treated as a one-time technological intervention.

In this context, digital governance reforms serve not only as tools for enhancing efficiency but also as catalysts for institutional development. By fostering adaptive capacities, EBGS enables public institutions to more effectively manage complexity, address emerging challenges, and maintain legitimacy in the perception of citizens. This perspective underscores the strategic importance of integrating digital transformation initiatives into broader governance reform agendas, ensuring that technological change contributes meaningfully to SDGs rather than resulting in isolated or short-lived improvements. A methodological limitation of this study pertains to the measurement instrument employed. Although the 22-item questionnaire was theoretically grounded and contextually adapted to the EBGS setting, comprehensive psychometric validation through EFA, CFA, CR, and AVE was not undertaken in the current study. Consequently, the scale should be regarded as an analytically useful yet still evolving instrument. Future research is necessary to validate its dimensional structure and measurement properties using larger samples and more rigorous latent-variable techniques.

An important limitation of this study pertains to the scope of inference that can be reasonably drawn from the empirical design. With a survey comprising 100 respondents distributed across 10 OPDs and a qualitative component involving 15 key informants, the study is more appropriately characterized as an exploratory mixed-methods case study rather than a foundation for strong general claims regarding phased adaptation, organizational differences, governance outcomes, or moderating effects within public-sector settings. Consequently, the findings should be interpreted as analytically informative and contextually grounded, but not as broadly generalizable beyond the West Sulawesi case. Future research should employ larger and more diverse samples, along with comparative or longitudinal designs, to test the robustness of the patterns identified here.

Another limitation concerns the potential impact of common-method bias and social desirability bias. Given that the quantitative component relied on self-reported survey responses collected at a single point in time, the observed associations may reflect a shared measurement context rather than entirely independent relationships among constructs. Furthermore, the relatively high score on the "Perceived Operational Challenges" dimension should not be construed as contradictory to high adaptation-related scores, as this dimension captures recognition of operational burdens rather than direct positive adaptation. Future research should employ formal common-method-bias diagnostics, use multiple data sources, and adopt more refined measurement designs to enhance interpretive confidence.

5. CONCLUSIONS

This study provides exploratory mixed-methods evidence on how ASN in West Sulawesi Province experience adaptation to EBGS as a form of digitally mediated organizational change. The findings indicate a high reported level of adaptation and suggest that interview narratives can be interpreted through overlapping themes of acceptance, disruption, recovery, and adjustment. Quantitatively, the study is limited to describing ASN adaptation as the primary measured construct. At the same time, governance-related implications are interpreted through the integrated explanatory reading of the mixed-methods findings rather than through a separate tested outcome model. The study also indicates that ASN adaptation may be associated with perceived improvements in governance. However, these relationships should be interpreted cautiously, given the case-based design, the sample size, and the lack of formal testing for moderation or causal sequencing. Rather than offering broadly generalizable conclusions, this study contributes a contextually grounded account of ASN adaptation in one provincial setting and identifies theoretically relevant patterns for future investigation. Larger comparative and longitudinal studies are needed to assess whether these exploratory patterns hold across wider institutional contexts.

6. POLICY IMPLICATIONS

The findings of this study present several significant implications for policymakers and leaders in the public sector who aim to advance digital governance reforms. Firstly, the implementation of EBGS should be explicitly conceptualized as a long-term governance planning tool, rather than a short-term technological initiative. Digital transformation strategies must incorporate human adaptation as a fundamental policy objective, acknowledging that ASN are not merely users of the system but are pivotal agents of institutional change.

Second, policymakers should formulate phased adaptation strategies that align with the stages of digital culture shock. The initial phase of enthusiasm should be bolstered with explicit guidance and realistic expectations. During crisis phases, targeted interventions such as practical training, peer mentoring, and psychological support are essential. The recovery and adjustment phases should be strengthened

through continuous learning mechanisms and opportunities for experimentation, facilitating the transition of ASN towards digital mastery rather than mere compliance.

Third, enhancing adaptive governance and institutional capacity is crucial for achieving sustainable digital transformation. Leadership development programs should emphasize adaptive leadership skills, such as openness to learning, tolerance for initial errors, and support for cross-unit collaboration. Organizational cultures that promote knowledge sharing and collective problem-solving should be actively fostered to mitigate prolonged adaptation stress and resistance.

Fourth, investments in digital infrastructure must be accompanied by ongoing investments in human capital development, encompassing digital literacy, data competencies, and change management skills. In the absence of such investments, digital systems exacerbate organizational fragmentation and inequality across governmental units.

To effectively align the implementation of EBGS with the objectives of SDG 16, it is imperative to monitor governance outcomes beyond mere technical performance indicators systematically. Policymakers should assess digital reforms based on their contributions to transparency, accountability, institutional effectiveness, and public trust. Integrating these indicators within national and regional development planning frameworks will facilitate the meaningful contribution of digital governance reforms to sustainable institutional development.

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