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Building digital governance ecosystem readiness for Indonesian regional representative council institution

Lalu Niqman Zahir[1*)], Wasisto Raharjo Jati[2]
[1]*Department of Government Studies, Graduate Program, Institute of Home Affairs Governance, Indonesia*
[2]*Center for Politics, National Research & Innovation Agency, Indonesia*

Abstract

The Regional Representative Council of the Republic of Indonesia (DPD RI) faces the challenge of digital transformation. This research evaluates its digital readiness, comparing it with Estonia, South Korea, Singapore, and India, to bridge the digital divide between the central office and regional offices. Using gap analysis, Multi-Dimensional Scaling (MDS), and the Analytical Hierarchy Process (AHP), we found that infrastructure, institutions, and human resources are key factors. The AHP prioritizes human resources (43.9%), institutions (31.1%), and infrastructure (19.6%). The top programs include i-Parliament Literacy (40.3%), i-Parliament Management (39.6%), and Digital Infrastructure (20.1%), which have the potential to increase the readiness index to 76.43 ("VERY READY"). Currently, the DPD RI index stands at 56.05 ("READY"), indicating significant regional disparities, particularly in Eastern Indonesia, and lagging behind benchmark countries in terms of interconnectivity, security, and parliamentary digitalization. This prioritizes "soft infrastructure" (80%) over "hard infrastructure" (20.1%), aligning with initiatives such as the Digital New Deal 2.0 and Digital India. This study validates and develops the combined application of gap analysis, MDS, and AHP.

Keywords: *digital ecosystem, e-parliament, gap analysis, multi-dimensional scaling, analytical hierarchy process*

*)corresponding author
E-mail : lalunikman@gmail.com

Introduction

The Fourth Industrial Revolution, also known as Industry 4.0, has had a significant impact on many facets of modern life, and among these is a transformation of how governments operate and administer their services (Kayembe & Nel, 2019; Schwab, 2018). This revolutionary phase in the digital transformation of the industrial sector is characterized by the implementation of groundbreaking technologies, including the Internet of Things (IoT), autonomous robots, and a wide array of other digital innovations that are reshaping industrial processes and capabilities (Lawelai et al., 2024; Rahman et al., 2024). These alterations have profound implications, impacting not just the economic sector, but also significantly influencing advancements in science, technology, and the overall structure and function of organizations.

Since 2016, the Regional Representative Council of the Republic of Indonesia (DPD RI), a governmental body, has been a user of and actively involved in the implementation of Electronic-Based Government Systems . While progress has been made in implementing Electronic-Based Government Systems, significant challenges persist in the creation and development of a fully comprehensive digital governance ecosystem. From a hardware standpoint, the project faces significant hurdles, primarily

due to constrained financial resources and the lack of a clearly defined development plan that outlines the project's progression. Concerning the software sector, challenges include a scarcity of skilled personnel for software development, over-reliance on foreign technologies, a deficiency in policies promoting domestic software development, inconsistent telecommunications infrastructure, and significant vulnerabilities in software security, exposing systems to cyberattacks and data breaches (Al-Turjman & Salama, 2020; Alizadeh, 2017; Boretti, 2024; Eagle, 2005; Karunakaran et al., 2019; Tariq, 2024). From an organizational software perspective, the lack of a clearly defined digital ecosystem development roadmap, combined with ambiguous business processes, presents significant challenges and impediments to progress. In the meantime, the brainware perspective reveals a unique set of challenges stemming from the inconsistent levels of employee skills and the insufficient number of human resources available.

Prior research exploring the impacts of digitalization encompasses a broad spectrum, with studies conducted globally to examine large-scale trends and locally to understand specific regional or community-level effects. According to a World Bank report from 2019, the achievement of successful digitalization requires a multifaceted approach that encompasses not just technological factors, but also the crucial elements of effective political leadership and robust public participation. The studies conducted by LPEM UI in Indonesia in 2021 and the assessments of legislative bodies done by Puskapol UI in 2022. Although these studies have been conducted, they are incomplete and have not yet provided a thorough examination of DPD RI's preparedness for the comprehensive digitalization of government operations.

The primary goal of this research is to define and thoroughly explain three key problems to be addressed in the study. In the beginning, a complete analysis needs to be performed to determine the Indonesian People's Representative Council's (DPD RI) preparedness for developing digital government ecosystems by considering the requirements for hardware, software infrastructure, organizational structures (orgware), and human capital (brainware) crucial for effective implementation and execution. Second, analyzing the implementation gap of Digital Government Ecosystems in Indonesia with good Digital Government Ecosystems such as in Estonia, South Korea, India and Singapore. Third, effective strategies must be formulated for developing and implementing robust digital government ecosystems within the DPD RI, utilizing appropriate tools.

The influence of technology's relentless progress on systems of governance has been nothing short of transformative, fundamentally altering how power is exercised, policies are enacted, and the very nature of political participation (Allenby, 2011; Selwyn et al., 2023). The rapid pace of technological advancements has dramatically altered the political and economic landscape, necessitating and driving inevitable transformations within governmental organizations across a wide spectrum of scales, scopes, and levels of complexity (Chari, 2025; Drezner, 2019; Goodstein, 2023; Kadtke & Wells III, 2014). The Internet of Things (IoT) phenomenon has caused a massive shift, changing production systems, management, and economic growth, and moving them all onto a digital foundation, thus demonstrating the magnitude of this change (Boehmer et al., 2020; Domingo, 2012; Tien, 2017; Vermesan et al., 2022).

Indonesia is making significant progress in its digital landscape, a fact underscored by its position as one of the nations in the ASEAN region with the most internet users. The We Are Social report from January 2024 indicates that Indonesia's internet penetration rate has significantly increased to 79.5%, representing a substantial

5.8% growth compared to the previous reporting period and a remarkable rise from the 50% penetration rate recorded in 2018. The considerable digital progress we're seeing is being actively driven forward by various government programs, such as the streamlining of frequency regulations to expedite the rollout of 5G networks and the establishment of collaborative working groups focused on significantly upgrading the digital infrastructure as part of the country's broader economic recovery plan.

Central Statistics Agency strongly support the case for digitalization (Hidayatur et al., 2024; Situmorang & Huda, 2024), as the informatics and communication sector demonstrated robust double-digit growth of 10.83% in the second quarter and 10.61% in the third quarter of 2020, a period marked by contractions in other sectors, ultimately contributing a significant 4.25% to Indonesia's GDP in the first quarter of 2020. While this sector's contribution is currently relatively modest, it possesses significant untapped potential to act as a catalyst, thereby generating substantial leverage effects and stimulating growth within other economic sectors.

Presidential Regulation No. 95 of 2018, issued by the Indonesian government in direct response to the ongoing digital transformation initiatives, specifically mandates the creation and implementation of Electronic-Based Government Systems within every government agency, thereby aiming to modernize and streamline government operations. To improve governance and accountability, the government's strategic Electronic-Based Government Systems initiative includes the implementation of e-Office, a system for electronic document management; e-Planning, a platform for national development planning; and e-LHKPN, a crucial tool for the transparent reporting of wealth by state officials.

Since the launch of its e-government portal in 2016 (https://e-dpd.ri.go.id/), the Indonesian People's Representative Council (DPD RI) has been actively implementing the principles of Good Governance in conjunction with the implementation of various technology-based systems which include but are not limited to Management Information Systems (SIM), electronic document management, an e-Library, and an e-Voting system. Additionally, DPD RI has launched several mobile applications including DPD RI Mobile, DPD RI Channel, DPD RI Radio, DPD RI Learning Center, and DPD RI Complaint Application.

Several studies on digitalization have been conducted both globally and locally. In particular, Gong & Yang (2024) analyzed six strategic factors in digital government transformation-business environment, digital infrastructure, financial capacity, innovation capacity, information security, and public demand and identified thirteen solutions in three stages of DGT: exploration, concentration, and complementation. These findings align with the readiness of the digital ecosystem in Gorontalo, which has proven to drive the transition of public services into the digital Society 5.0 era. Suparno & Kamuli (2023) revealed that 93.3% of villages in Gorontalo have internet access, 72.68% of households have mobile phone access, and 76.68% of households access the internet. The Electronic-Based Government System of Gorontalo Province achieved a score of 3.18 (good ranking); however, at the district and city levels, the ranking is still only adequate or poor, highlighting imbalances across various levels of government.

Additionally, Gusman & Kusuma (2023) identified a total gap of 22 points between the design and implementation of the Regional Financial Management Information System in Kampar Regency, with the largest gaps found in the information dimension (5 points) and the workforce/skills dimension (4 points). This gap illustrates the risk of partial implementation failure, reflecting broader concerns about misalignment between design and implementation in digital governance initiatives.

Similarly, Magliocca et al., (2024) explore the role of technological readiness and the digital divide at the meso level, proposing a systemic model to balance economic and social values in addressing sustainability challenges in digital ecosystems. Their contribution expands the discussion beyond technical readiness, emphasizing the interaction between digital transformation and socio-economic sustainability. Shabdin et al., (2024) also contribute to this discourse by developing a comprehensive framework for analyzing digitalization gaps, identifying 45 essential components across three categories: Human (e.g., workforce readiness, digital leadership), Process (e.g., governance, organizational structure), and Technology (e.g., infrastructure, emerging technologies, data-driven decision-making). This framework provides a systematic and multidimensional approach to evaluating digital transformation efforts.

However, while these studies highlight the technical and managerial benefits of digitalization in government, its political dimensions remain relatively unexplored. Jati, (2024) addresses this gap by analyzing Indonesia's paradigm shift from a semi-federal decentralization model to an administrative-technocratic model, finding that the representation of regional political aspirations in the DPD is still less prominent than in the DPR. This suggests that digital government transformation cannot be fully understood without considering the political and institutional context in which it takes place.

Based on the previous studies, no research has addressed digital governance ecosystem development in DPD RI specifically. This study offers novelty distinguishing it from previous research in Indonesia and reference countries like Estonia, South Korea, India, and Singapore, encompassing five aspects: theoretical and conceptual perspectives, methodological approaches, contextual and comparative analysis, implementation and policy dimensions, and theoretical and practical contributions

This research is projected to advance both the theoretical understanding and the practical application of the subject matter. From a theoretical standpoint, this research offers significant conceptual advancements to the field of governance science, specifically focusing on the practical implementation and implications of digital government ecosystems within public sector organizations, including, but not limited to, the Indonesian People's Representative Council (DPD RI).

Research Methods

This research utilizes a thorough mixed-methods approach, incorporating both quantitative and qualitative analyses within a multifaceted methodological framework to ensure a comprehensive understanding of the subject matter. This research is methodologically rigorous, initiating with the careful creation of instruments for data collection, which is then undertaken systematically across three principal sources: the central offices of the he Regional Representative Council (DPD), the provincial offices of the DPD, and a set of internationally comparable countries chosen for their relevance to the study.

The methodological framework is comprised of three key analytical components, namely, an existing and gap analysis to identify current conditions and unmet needs, a multi-dimensional scaling (MDS) analysis utilizing the RAPFISH technique to visualize relationships between different factors, and an analytical hierarchy process (AHP) to prioritize and weigh those factors for a comprehensive evaluation. In brief, Multi-Dimensional Scaling (MDS) and the Analytical Hierarchy Process (AHP) are distinct decision-making tools that offer contrasting approaches to address the complexities inherent in problem-solving scenarios. While

multidimensional scaling helps with visualizing the relationships that exist between items, the analytic hierarchy process is useful for prioritizing criteria and for making complex decisions.MDS, which generates a spatial representation that illustrates the degree of similarity or dissimilarity between items, stands in contrast to AHP, which decomposes a complex problem into a hierarchical structure consisting of criteria and alternatives in order to identify the optimal choice.

The first step in this process is to perform a thorough gap analysis to determine the current level of digital preparedness across DPD RI's central and provincial offices, which will involve identifying inconsistencies across hardware, software, organizational structures and human capital. In this analysis, Multidimensional Scaling (MDS) leverages a modified version of the RAPFISH (Rapid Appraisal for Fisheries) methodology, tailored for the purpose of evaluating a government's preparedness for digital transformation. Employing this technique allows for the determination of RAPFISH dimensions, leverage attributes, and readiness indices specific to various geographical levels. In addition to the other analyses, this study incorporates a simulation of readiness interventions to forecast potential improvements resulting from strategic interventions.

The hierarchical analysis, performed by the AHP component with the aid of Expert Choice software, results in a prioritized ranking of development programs, thus streamlining the selection process. The culmination of this process is the identification of key programs which constitute the Program Matrix for Government Digitalization Readiness at DPD RI, a matrix formed by integrating data from DPD RI internal documents, assessments of provincial digital infrastructure, and comparative benchmarks against Estonia, South Korea, India, and Singapore. The analytical process is designed to produce robust findings by systematically cross-validating the results generated from various methodologies. The research design incorporates a robust triangulation strategy by methodologically integrating gap analysis results to parameterize multidimensional scaling (MDS), thereby informing the analytic hierarchy process (AHP) for the prioritization of key issues. By using this interconnected approach, we can conduct a thorough evaluation of digital readiness and simultaneously pinpoint key strategic priorities that will drive our transformation initiatives forward.

The final output, a comprehensive Program Matrix, synthesizes the findings from each of the analytical components, thereby providing actionable strategies to enhance the digital ecosystem of the DPD RI. This design enables evidence-based policy recommendations aligned with both institutional capacity and technological requirements. The conceptual design for this research is illustrated in figure 1, providing a visual representation of the project's core ideas.

This research was conducted at the Indonesian Regional Representative Council (DPD RI) and its regional offices across the archipelago. Data collection, involving both primary and secondary sources, was carried out over a two-month period, from March to April 2024. Three methods were employed: literature review, questionnaire distribution, and in-depth interviews, selected to ensure comprehensive insights from multiple stakeholder perspectives. Data for gap analysis and multidimensional scaling (MDS) were obtained from 34 provincial DPD offices and one central office. MDS, a multivariate analysis used to determine the relative position of objects based on similarity assessments and to examine interdependencies among variables (Johnson, 1992), was applied using the RAPFISH technique to identify the key dimensions underlying respondents' perceptions. These steps are structured as shown in Figure 2.

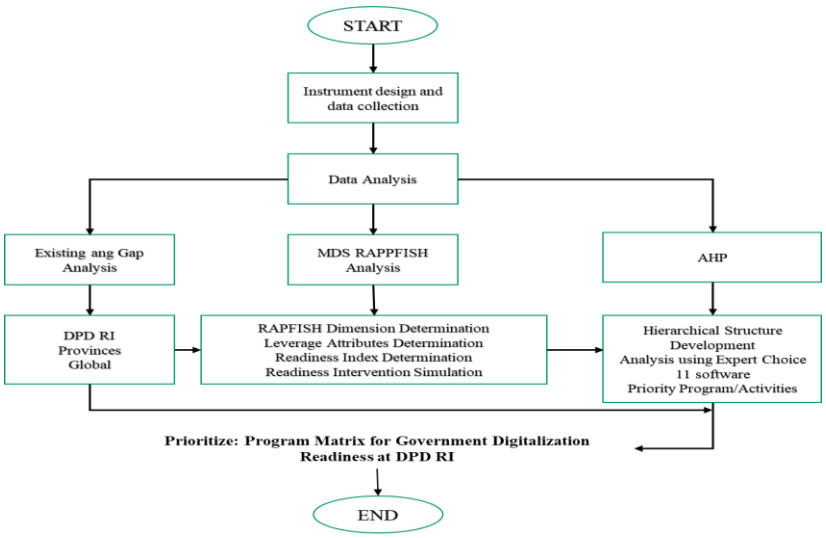

Figure 1. Conceptual Research Design
Source: proceesed by authors

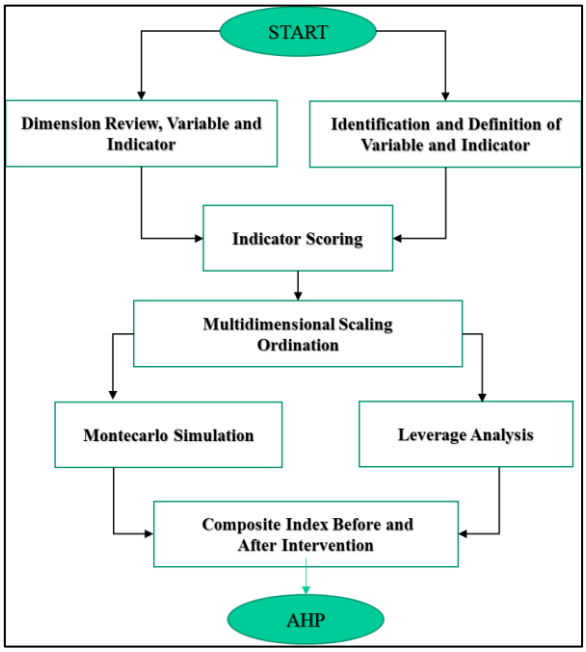

Figure 2. MDS-based RAPFISH Analysis for AHP Analysis
Source: proceesed by authors

The process of establishing a composite index allows for the identification and determination of the relevant dimensions, variables, and indicators involved. The process of determining these three elements requires a rigorous and well-grounded analysis, drawing upon appropriate theoretical frameworks, perspectives, and analytical approaches to consider all relevant factors and strategies. The creation of a thematic index is complete for each individual dimension, ensuring comprehensive organization. A compilation of thematic indices is used to create the composite index, which is then transformed into a symmetric index and finally presented as a single, composite measure. A composite index needs to be developed in situations where individual indicators, on their own, prove insufficient for accurately representing multifaceted or complex concepts. In an ideal scenario, a composite index would possess the capability

to assess multifaceted concepts that elude the grasp of any single indicator, thus offering a more comprehensive and nuanced understanding of the phenomenon under study.

The process of analysis using MDS-based add-ins within Microsoft Excel typically involves several key steps: first, inputting questionnaire data into the MDS RAPFISH program to generate a scoring summary that identifies the modal response for each attribute; second, identifying the primary "good" and "bad" benchmark points across all attributes; and finally, establishing two additional reference points representing the midpoint between the identified "good" and "bad" points to provide a more comprehensive representation of attribute scores. To establish vertical directionality ("up" and "down"), these two key supplementary points are utilized as references; these references are then incorporated into the input process for anchor points, alongside the execution of the RAPFISH, Leverage, and Montecarlo algorithms.

The feasibility of MDS (Goodness of fit) is assessed from the stress value calculated using Kruskal's formula (1964):

$$\sqrt{\frac{\sum(d_{ij} - \widehat{d_{ij}})}{\sum {d_{ij}}^2}}$$

d_{ij} = Actual distance between two points i and j

$\widehat{d_{ij}}$ = Predicted distance based on the MDS model

The magnitude of the stress value is related to the number of dimensions to be analyzed. The more dimensions there are, the smaller the stress value will be. The stress value is also related to the RMS (root mean square) or R-square value. The larger the RMS value, the smaller the stress value.

Table 1. Relationship between Goodness of Fit and Stress

No	***Stress***	***Goodess of fit***
1	0,200	Poor
2	0,100	Sufficient
3	0,050	Good
4	0,025	Very Good
5	0,000	Perfect

source: processed by authors

The Analytical Hierarchy Process, also known as AHP, serves as a valuable method for establishing priorities among the various dimensions that contribute to a company's digitalization readiness. To begin using the AHP, one must first construct a hierarchy that displays the relationship between the overall goal, the criteria used to judge the alternatives, and the alternatives themselves.

Results and Discussion

MDS Analysis of Digital Government Ecosystem Development in DPD RI

The results of the MDS analysis clearly illustrate the growth of DPD RI's digital government ecosystem, which can be understood through three fundamental dimensions: the underlying infrastructure, the institutional framework, and the human resources involved in its development and operation. While not yet fully optimal, positive progress toward achieving GOOD status has been observed across all three dimensions.

Infrastructure Dimension

Considering the sustainability scale, the infrastructure dimension holds a position of 65.98, exhibiting a stress value of 0.1183, which falls within the fair category, and demonstrating a very good RSQ of 0.9810. In this dimension, two key attributes providing leverage are the Digital Gap, which scored 11.8, and the Availability of Digital Infrastructure in Center and Regions, which received a score of 6.2.

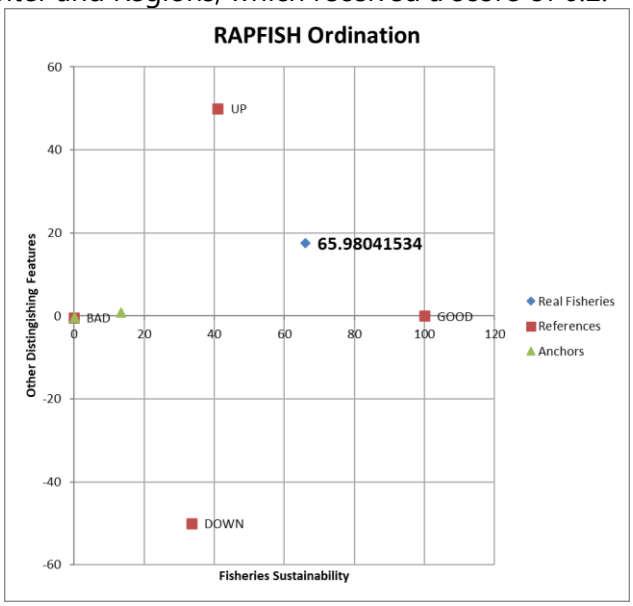

Figure 3. RAPFISH Ordination of Infrastructure Dimension

source: processed by authors

An observed value of 65.98 indicates progress toward a GOOD outcome, but the situation is not yet optimal, suggesting that additional actions may be required to reach the desired level of performance. The digital divide presents a significant challenge, manifesting not only geographically, as seen in the disparity between Java and its outer regions, but also across diverse demographics encompassing age groups, educational attainment, and socioeconomic strata.

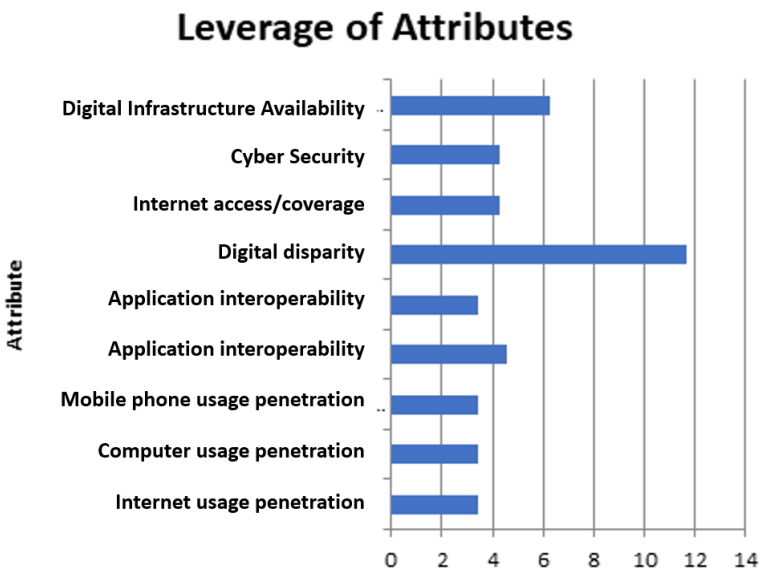

Figure 4. Leverage Attributes of Infrastructure Dimension

source: processed by authors

Institutional Dimension

With regard to the institutional dimension, a positional value of 58.14 was obtained, which is associated with a stress value of 0.1491 (representing a fair level of stress within the model) and an RSQ value of 0.9473 (demonstrating a very good goodness of fit and overall model reliability). In this dimension, the three key factors influencing the outcome are the perceived leadership of the DPD RI at the center, scoring 5.2, the commitment demonstrated by the DPD RI leadership, with a score of 3.7, and the perception of DPD RI members in the regions, which received a score of 3.2.

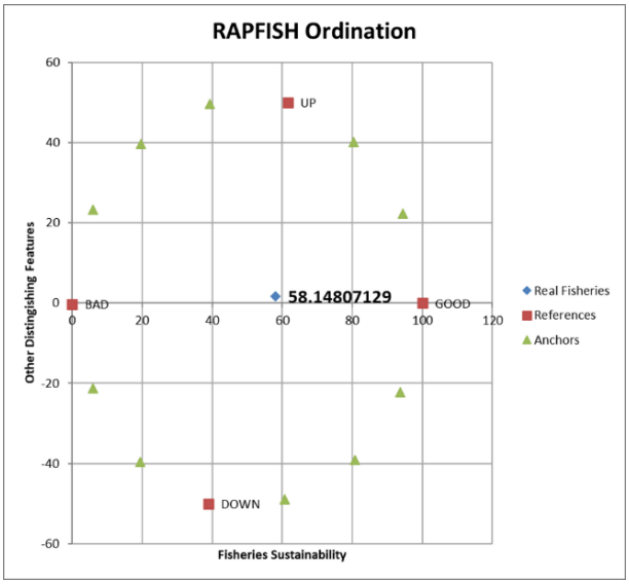

Figure 5. RAPFISH Ordination for Institutional Dimension

Source: proceesed by authors

The RAPFISH ordination for the Institutional dimension, which yielded a value of 58.14, indicates a positive trend toward achieving GOOD status. The central role of leadership in guiding and driving the process of digital transformation is confirmed by this significant finding; leaders are therefore required to function not only as strategic planners and decision-makers, but also as key influencers in shaping the organizational culture that fosters successful digital transformation initiatives.

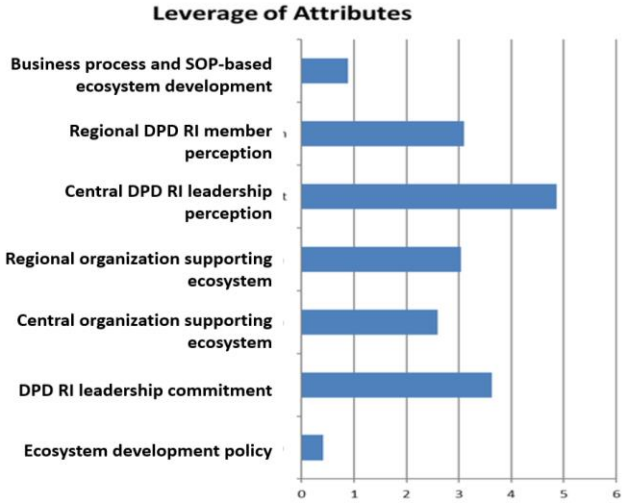

Figure 6. Leverage Attributes of the Institutional Dimension

Source: processed by authors

Human Resources Dimension

In the analysis, the HR dimension is situated at coordinate 61.45, exhibiting a stress value of 0.1502, which is considered fair, and demonstrating a very good RSQ value of 0.9464. The three most influential factors contributing to leverage are the understanding and capabilities of DPD RI members (scored 6.0), the average number of years of education within the society (scored 5.8), and the availability and competence of management staff at the center (scored 5.3).

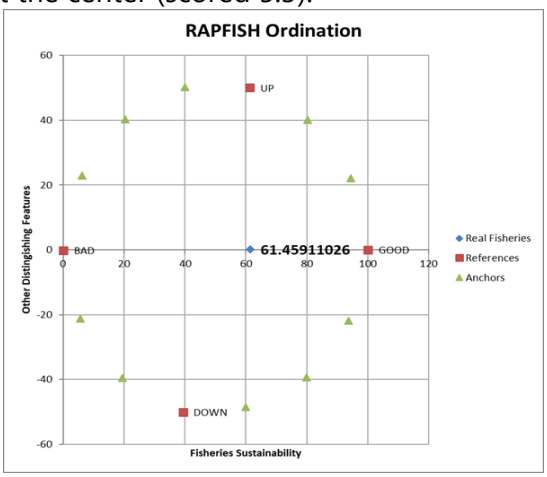

Figure 7. RAPFISH Ordination of Human Resources Dimension

Source: processed by authors

The RAPFISH ordination shows that the HR dimension has achieved a value of 61.45, surpassing the midpoint and demonstrating progress toward a GOOD status designation. The successful digital transformation of the DPD RI is contingent upon the capabilities of its council members and requires careful synchronization with the level of preparedness within the community it serves, indicating a significant dependence on both factors.

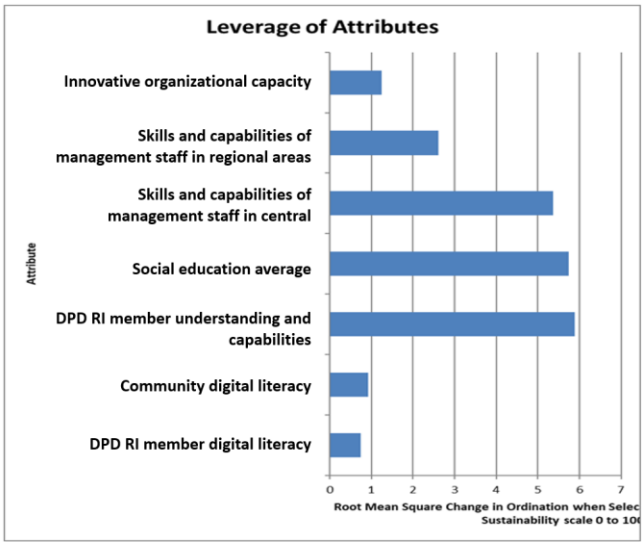

Figure 8. Leverage Attributes of Human Resources Dimension

Source: processed by authors

Considering the interconnectedness of these three dimensions as a holistic ecosystem, an integrated approach that takes into account all leverage factors is necessary for the optimization of DPD RI's digital transformation.

Analysis of DPD RI Digitalization Readiness

The analysis of DPD RI digitalisation readiness shows quite positive progress toward better digital governance status. The DPD RI Digitalisation Readiness Index

reaches a value of 56.05, placing it in the READY category, although at the lower bound of this category's range (50-75).

Dimensional Comparison

The three dimensions of the RAPFISH Ordination—Infrastructure, Institutional, and HR—show a spread in their values, with Infrastructure exhibiting a value of 65.98, Institutional a value of 58.15, and HR a value of 61.46, based on the ordination results.

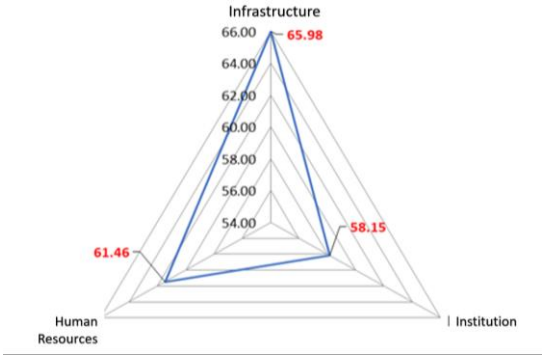

Figure 9. Kite Diagram
Source: data processed by the authors

Infrastructure, Institutional, and HR dimensions received weighted values of 0.1207, based on a weighted calculation incorporating the input from three expert respondents. Table 1 presents the numerical results obtained from the weighting procedure that was conducted. A DPD RI Digitalization Readiness Index value of 56.05 was derived through a process that involved both multiplying dimensional values and assigning a weighted value to each individual dimension. Since the index value is between 50 and 75, inclusive (50 ≤ DRI ≤ 75), its status is categorized as READY.

Table 2. Determination of the Regional Representative Council (DPD RI) Digitalization Readiness Index

Dimension	Combined Weight	Weighted Weight	Initial Dimension Value	Composite Index
Infrastructures	0,1112	0,1207	65,98	7,96
Institution	0,3360	0,3645	58,15	19,60
HRD	0,4746	0,5148	61,46	29,17
Sum	0,9218	1,0000	185,59	56,05
				Ready

Source: proceesed by authors

With a value of 65.98, the Infrastructure Dimension exhibits the highest score, thereby suggesting a robust and sufficient technical base for the project or system in question. In contrast to the Institutional Dimension, which has the lowest value of 58.15, the HR Dimension is in the middle, with a value of 61.46.

Dimensional Contribution to Index

Following a weighting process that incorporated assessments from three expert groups academics, government representatives, and information technology professionals and ensured a consistency ratio (CR) of 0.1 or less, the weighted values for the readiness index were determined. The Human Resources (HR) Dimension

emerged as the most significant, with a weight of 0.5148, contributing 29.17 to the overall index. The Institutional Dimension followed, with a weight of 0.3645 and a contribution of 19.60 to the total score. Although the Infrastructure Dimension initially recorded the highest value, its relatively low weight of 0.1207 meant that it contributed only 7.96 percent to the overall result.

Intervention Strategy

The analysis of leverage attributes indicates that a number of attributes have reached their maximum potential; these include the public perception of the DPD RI's leadership, the level of commitment shown by that leadership, and the average number of years of education across the population. The evidence shows that these attributes have become foundational and essential elements for the digitalization and sustainability of the DPD RI, creating a firm base for continued growth and success. The development of our intervention program will center on those attributes that, across all three dimensions, have room for improvement and have yet to achieve their maximum potential, ensuring that our approach is both comprehensive and balanced.

Table 3. Initial Scores and Intervention of Leverage Attributes

Leverage Attributes	Initial Score	Max Score	Intervention
Infrastructure			
Digital Divide	0	1	1
Availability of digital infrastructure in regions and center	1	2	2
Institutional			
Perception of DPD RI members in regions	1	3	3
Ecosystem Development Policy	1	2	2
Central organization handling ecosystem	1	2	2
HRD			
Understanding and Capability of DPD RI members	1	3	3
Availability and capability of management staff at center	1	2	2

Source: proceesed by authors

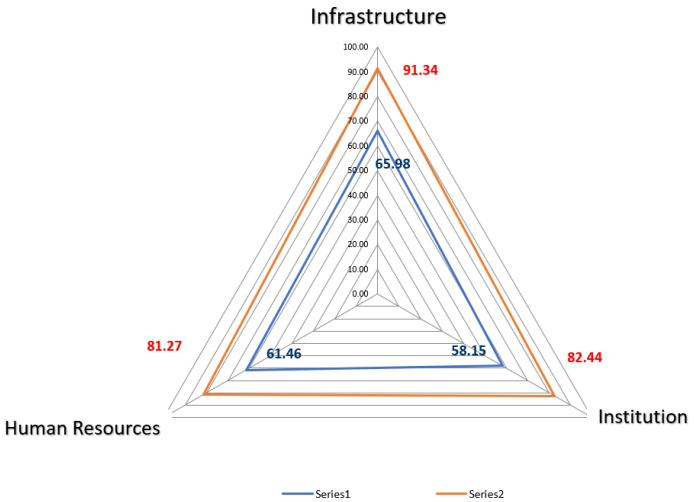

Figure 10. Triangle Diagram Before and After Intervention
Projection after Intervention
Source: proceesed by authors

A comparison of conditions before and after the intervention, as illustrated in the provided figure, reveals substantial improvements: infrastructure rose from an initial value of 65.98 to a post-intervention value of 91.34, institutional capacity similarly improved from 58.15 to 82.44, and human resources also experienced a notable increase, rising from 61.46 to 81.27. Following the intervention, the calculated value of the DPD RI Digitalization Readiness Index is as follows.

Table 4. Determination of DPD RI Digitalization Readiness Index After Intervention

Infrastructures	**Simulation Index**	**Weight**	**Composite Index**
Institution	91,34	0,1112	10,16
HRD	82,44	0,3360	27,70
Sum	81,27	0,4746	38,57
Infrastructures	255,05	0,9218	76,43
			Highly Ready

Source: proceesed by authors

As shown in table 4, the successful implementation of this intervention strategy requires not only a sustained commitment from all stakeholders but also the allocation of adequate resources to support its activities and the establishment of effective coordination mechanisms between the central office and regional branches to guarantee seamless execution across all levels. With a comprehensive strategy in place, the DPD RI is striving for and expects to maintain a state of optimal digital governance, believing this approach will successfully achieve this objective.

In sum, the MDS findings generally showed the readiness of system to support digital governmnt in DPD RI. All the parameters revealed positive impact on the digitalization. While this MDS coul be a important signal, it needs a support from AHP Analysis to understand whether the ecosystem is ready or not for preparing digitalization services.

AHP Analysis of Digital Government Ecosystem Development in DPD RI

AHP Hierarchical Structure

Following a thorough analysis using the RAPFISH methodology, we've pinpointed the key leverage attributes that significantly impact the three core dimensions—infrastructure, institutional frameworks, and human resources—of DPD RI's digital transformation. To successfully carry out the developed intervention strategy, a method is required to help those making decisions choose which of the suggested programs should be given the highest priority, ensuring that resources are allocated effectively to the most impactful initiatives. In this prioritization analysis, the Analytical Hierarchy Process (AHP) stands out as the most fitting method because of its systematic approach to processing both qualitative and quantitative factors, which are crucial for a thorough analysis (Saaty, 2008).

A hierarchical AHP model provides a structured approach for the DPD RI to rank and evaluate the relative importance of various programs designed to enhance the digital ecosystem:

AHP Hierarchical Structure for Ranking Digital Ecosystem Improvement at DPD RI

The results of our analysis, conducted using the Analytical Hierarchy Process (AHP) within the Expert Choice 11 software application, reveal a clear prioritization scheme for improvements to the DPD RI Digitalization Readiness Index.

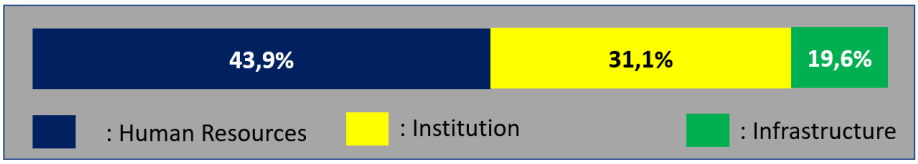

Figure 11. Dimension Priorities for Improving Digitalization Readiness Index Dimension Priority
Source: proceesed by authors

A comprehensive analysis reveals that Human Resources (HR) has been assigned the highest priority weight, a substantial 49.3%, clearly signifying its dominant influence as the most crucial criterion within the context of DPD RI's ongoing digital transformation initiatives. While infrastructure is assigned the lowest weight at 19.6 percent, institutional factors hold the second priority with a weighting of 31.1 percent.

The analysis results are deemed acceptably consistent, as evidenced by an inconsistency ratio of 0.05, a value that falls beneath the established limit of 0.1.

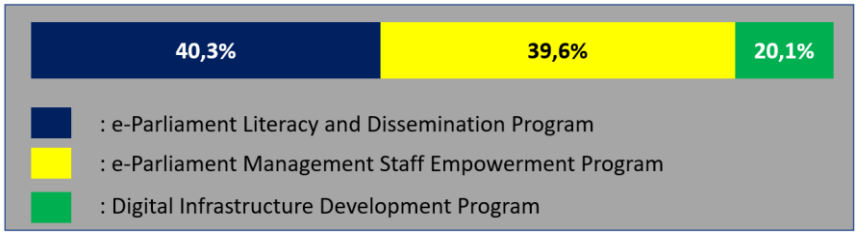

Figure 12. Program Priorities for Improving Digitalization Readiness Index
Source: proceesed by authors

According to the results of the Analytic Hierarchy Process (AHP), the Literacy and Dissemination Program concerning i-Parliament received an overall score of approximately 40.3 percent. This crucial objective takes precedence over all others, necessitating the implementation of three key activities: dissemination of i-Parliament information to DPD members, dissemination of i-Parliament information to the DPD Secretariat General, and public dissemination of i-Parliament information. Furthermore, the i-Parliament Management Strengthening Program has seen an increase of approximately 39.6 percent. Due to the insignificant disparity of merely 0.7% observed between the performance metrics of the first and second programs, it can be reasonably inferred that both programs are roughly equivalent in terms of their significance and importance within their designated operational contexts. The program is comprised of five core activities the Establishment of a Secretary-General Decree regarding i-Parliament, the Strengthening of the i-Parliament Management Organization, the Improvement of Capacity and Capability of i-Parliament Managers at the Central Level, Education and Training for Regional Areas, and the Addition of i-Parliament Management Staff each specifically designed to contribute to the overall program objectives. Concluding our review, we find that the Digital Infrastructure Provision Program accounts for roughly 20.1% of the overall budget. Despite being assigned the lowest priority, this component remains a substantial part of the overall project, encompassing four key activities: the provision of infrastructure in the central DPD RI, the assurance of infrastructure availability in Western Indonesia, the provision of infrastructure in Eastern Indonesia, and finally, the provision of infrastructure in the newly formed autonomous regions (DOB).

The prioritization of weights in this distribution clearly shows a major change in the approach to the digitalization strategy, placing a strong emphasis on the development of "soft infrastructure," such as digital literacy training and human resource capacity building, which accounts for almost 80% of the total allocation, while the importance of "hard infrastructure," encompassing physical infrastructure components, is acknowledged, albeit with a lower priority. This approach underscores the critical understanding that the successful implementation of digital transformation initiatives hinges not merely on the availability of advanced technologies, but also, and perhaps more importantly, on the preparedness and ability of human resources to effectively adopt, utilize, and manage these technologies to achieve the desired outcomes.

Development of Activity Matrix

The digitalization readiness activity matrix, developed for the DPD RI, showcases a strategic approach that prioritizes three key programs, a prioritization determined through a comprehensive AHP analysis. The i-Parliament Literacy and Dissemination Program and the Management Strengthening Program were each assigned the highest weighting, 40.3% and 39.6% respectively, clearly demonstrating that the human resource component is paramount to the success of DPD RI's digital transformation initiatives. Due to the assumption that it will be carried out concurrently with the implementation of the two primary programs, the Digital Infrastructure Provision Program, despite its fundamental importance, was assigned a lower weight of only 20.1%.

The geographical implementation strategy, designed for the period of 2025-2029, will proceed in phases, commencing in central Indonesia before expanding to Western Indonesia, Eastern Indonesia, and culminating in the newly formed Autonomous Regions (DOB). This strategy aligns with global learning showing that 70% of e-government success is determined by human resource capacity, not technology. DPD RI adopts best practices from pioneering countries such as Estonia, South Korea, and Singapore in building a holistic digital foundation - from institutional policies, human resource capacity development, to infrastructure supporting inclusivity.

By adopting this approach, the DPD RI aims to become a pioneering and highly effective digital parliament, setting a new standard for transparency and efficiency among its ASEAN counterparts.

Conclusion

A comprehensive gap analysis has revealed that the DPD RI is grappling with multifaceted and complex challenges related to digital transformation, exhibiting considerable disparities in progress between the central office, which shows relatively more advancement with 52% of its digital transformation components implemented, and its regional offices, particularly those located in Eastern Indonesia, which lag significantly behind. TThe shortcomings in this area include a lack of digital infrastructure, especially concerning crucial components like data resource centers, wide area networks, and security systems, and a significant deficiency in digital human resources, most notably in the fields of cybersecurity, programming, and technical support. Comparisons with global benchmarks like Estonia, India, South Korea, and Singapore further highlight DPD RI's substantial gaps in key aspects of digital transformation, including digital resilience (Estonia with Data Embassy vs DPD RI without DRC), interoperability (Estonia with X-Road vs DPD RI with a 61% IaaS gap),

large-scale implementation (India with NeVA), cybersecurity (South Korea with 700+ officers across 10 regional centers vs DPD RI without cybersecurity experts), and cloud efficiency (Singapore's cloud-first approach) - indicating the need for a comprehensive and structured digital transformation strategy to holistically enhance DPD RI's digital capabilities.

DPD RI's state of readiness for digitalization is classified as "READY", achieving an index score of 56.05, demonstrating a sufficient level of preparedness for the digital transition. The READY value reflects significant digital infrastructure disparities between central and regional areas; while Central DPD boasts 52% infrastructure completion, it still faces shortfalls in Data Recovery Center (DRC), Wide Area Network (WAN), and security, whereas Eastern Indonesian regions exhibit the most pronounced deficiencies. With respect to staffing, the center faces a critical shortfall in key personnel; 83% of essential positions are incompletely filled, a problem particularly acute in cybersecurity where there is a complete lack of qualified employees. CIn a comparison with reference countries, the Indonesian People's Representative Council (DPD RI) shows a significant lag in several key areas, including digital resilience, interoperability of systems, cybersecurity measures, and the development and implementation of effective digital parliament platforms. MDS analysis results identify leverage attributes through Leverage Analysis, namely digital infrastructure availability, human resource capacity, and institutional/digital ecosystem governance.

Analysis of priorities reveals that the human resource dimension was deemed the most important, receiving a weighting of 43.9 percent, with institutional factors and infrastructure following at 31.1 percent and 19.6 percent, respectively. The significance of this finding lies in its demonstration of a paradigm shift within the field of digital transformation, a shift that underscores the necessity of considering human and institutional elements in addition to technological components for success.

Results regarding program priorities indicate that the i-Parliament Literacy and Dissemination Program received 40.3% of the priority distribution, followed by the i-Parliament Management Strengthening Program at 39.6%, and lastly, the Digital Infrastructure Provision Program with 20.1%. The prioritization of this distribution clearly favors soft infrastructure, as 80% of the total is assigned to it compared to the 20.1% allocated for hard infrastructure. The 2025-2029 roadmap for implementing these priority programs leverages a readiness index of 76.43 ("HIGHLY READY" category), demonstrating substantial improvements across key dimensions, namely infrastructure (increasing from 65.98 to 91.34), institutional capacity (rising from 58.15 to 82.44), and human resources (progressing from 61.46 to 81.27).

Based on the digitalization readiness program matrix as effective strategies for DPD RI government, it is recommended to implement three priority programs: (1) i-Parliament Literacy and Dissemination Program (40.3%) through dissemination activities for DPD RI Members, DPD Secretariat, and the general public implemented at central and regional offices continuously during 2025-2029; (2) i-Parliament Management Strengthening Program (39.6%) through Secretary-General Decree establishment, organizational strengthening, capacity and capability improvement for central and regional managers, and addition of management staff; and (3) Digital Infrastructure Provision Program (20.1%) with gradual focus on Central DPD RI infrastructure (2025-2026), followed by infrastructure provision in Western Indonesia, Eastern Indonesia, and New Autonomous Regions (2027-2029). Implementation of these programs will enable DPD RI to improve its digital readiness in a structured and sustainable manner.

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