



Digitalization Of Local Regulations: Challenges And Opportunities In Improving Legal Transparency And Accessibility In The Digital Era

Fuji SM Bako

E-mail: fujismbako@uinsu.ac.id

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Abstract

The digitalization of Regional Regulations (Peraturan Daerah/PERDA) has become a strategic instrument in strengthening the implementation of electronic-based government (e-Government) and promoting the principles of good governance, particularly transparency, accountability, efficiency, and public participation. As regional governments produce an increasing number of legal instruments, the availability of an accessible, integrated, and reliable digital legal information system is essential to ensure legal certainty and improve public access to regional legislation. Nevertheless, the implementation of PERDA digitalization in Indonesia continues to face various structural, technological, and institutional challenges that hinder its optimal realization. This study aims to analyze the urgency of digitalizing Regional Regulations, identify the challenges encountered in its implementation, and examine the opportunities for strengthening an integrated digital legal governance system in Indonesia. The research employs a normative juridical method using a statutory, conceptual, and library research approach by examining legislation, legal doctrines, scholarly literature, and relevant policy documents concerning electronic governance and legal information systems. The findings indicate that the digitalization of Regional Regulations, particularly through the Legal Documentation and Information Network (JDIH), has significantly improved public accessibility to regional legal products, enhanced transparency in legislative processes, and facilitated legal harmonization and administrative efficiency. However, its implementation remains constrained by disparities in digital infrastructure among regions, the absence of standardized digital governance mechanisms, limited interoperability between information systems, budgetary constraints, and inadequate digital literacy and technical capacity of government personnel. The study concludes that optimizing the digitalization of Regional Regulations requires the establishment of a nationally standardized and interoperable digital legal information system, supported by sustainable infrastructure development, institutional capacity building, and comprehensive regulatory harmonization to realize effective, transparent, and inclusive digital governance.

I. INTRODUCTION

The Unitary State of the Republic of Indonesia as a state based on law as stipulated in Article 1 paragraph (3) of the 1945 Constitution of the Republic of Indonesia has the logical consequence that all aspects of social, national, and state life must be based on applicable law. In the hierarchy of laws and regulations in Indonesia, Regional Regulations (Perda) play a very strategic role as legal instruments that provide space for regions to regulate their own affairs based on the principles of autonomy and assistance tasks. Perda functions to bridge national policies with the characteristics, needs, and local wisdom of the communities in each region (Jimmy, 2010).

However, the effectiveness of law enforcement and the enforceability of regional regulations

often run up against a classic problem: limited dissemination of legal information to the wider public. For years, methods of disseminating regulations at the regional level have relied on conventional methods, such as printing regional gazettes in physical form or conducting face-to-face outreach, which have very limited reach (Tatang, 2006). This one-way and limited communication pattern has the potential to trigger legal alienation, where people become alienated from legal products created by their own government, even though these regulations directly bind their rights and obligations.

This situation is exacerbated by a universal legal fiction in Indonesian law, namely the principle of *ignorantia legis excusat neminem*, or everyone is presumed to know the law once a

regulation has been promulgated. This principle demands a moral and constitutional responsibility from local governments to provide the broadest possible access to valid legal documents. When public access to the contents of regional regulations is obstructed or difficult to obtain in real time, legal certainty, a pillar of justice, becomes difficult to achieve, thus triggering public non-compliance stemming from ignorance.

Over time, the global world has entered the fourth industrial revolution, triggering technological disruption in various sectors, including government administration. The Indonesian government responded to this paradigm shift by implementing the Electronic-Based Government System (SPBE) policy through Presidential Regulation No. 95 of 2018. This policy mandates the transformation of bureaucratic governance from a manual system to digital governance (E-Government) in order to create more effective, efficient, transparent, and accountable public services at all levels, including in the aspects of the formation and management of regional legal products.

The urgency of utilizing communication technology is also normatively reinforced through the establishment of the National Legal Documentation and Information Network (JDIHN) as stipulated in Presidential Regulation Number 33 of 2012. This regulation requires all government agencies, including provincial and district/city governments, to manage legal documentation in an integrated, information technology-based network. The presence of JDIH at the regional level ideally serves as the main gateway for the digitalization of Regional Regulations, in order to facilitate the tracking of legal documents, both by government officials, academics, legal practitioners, and the general public.

Through the digitization of regional regulations, public information transparency can be optimally realized in accordance with the mandate of Law Number 14 of 2008. Regional legal documents that have been converted into digital format and uploaded to the official government website not only improve readability but also minimize the potential for regulatory overlap. The digital system makes it easier for regional governments to map the status of a regional regulation's validity—whether the regulation is still in effect, has been amended, or even revoked by a higher regulation—thus

facilitating the process of legal harmonization (Akhmad, 2024).

Despite the regulatory foundation and digital platforms like JDIH (Java Development Planning Agency), the implementation of digital regional regulations in various regions across Indonesia still faces significant challenges. One crucial issue that dominates local government websites is the delay in updating legal documents. It's often found that a regional regulation that has been ratified and promulgated in the regional gazette takes months to become digitally accessible to the public, thus undermining the essence of the speed and convenience of information technology itself.

The next challenge faced in this transformation process is the limited human resources (HR) capacity within regional bureaucracies. Many information system managers or JDIH operators in the regions lack adequate technical qualifications in information and communication technology (ICT) or an understanding of digital legal metadata management. As a result, legal website management tends to be a formality or simply a public relations exercise, without innovation in content presentation or ongoing system maintenance.

In addition to internal bureaucratic factors, disparities in digital infrastructure across regions in Indonesia are also a significant stumbling block. Local governments outside Java, particularly in the remote, frontier, and outermost (3T) regions, often face limited hardware, server capacity, and unstable internet connections. These geographical barriers and regional fiscal constraints have led to uneven implementation of legal digitization and have failed to achieve equitable access to legal information for all citizens.

Based on the complexities outlined above, an in-depth study of the digitalization of local regulations is essential to chart the direction of reforming regional legal governance. Therefore, this research is crucial to further analyze the opportunities, challenges, and strategies for strengthening the digitalization system for regional regulations. This research will be presented in a scientific article entitled "Digitalization of Regional Regulations: Challenges and Opportunities in Improving Legal Transparency and Accessibility in the Digital Era."

II. RESEARCH METHODE

This research uses a type of normative legal research (doctrinal legal research) which focuses

on inventory, explanation, and critical analysis of legal principles, synchronization of laws and regulations, and literature related to the digitalization of legal products (Petter, 2016). The research approach applied is a statute approach to examine regulations related to the Electronic-Based Government System (SPBE) and the Legal Documentation and Information Network (JDIH), as well as a conceptual approach to dissect the doctrines of public information disclosure and bureaucratic accountability in the digital era.

The data sources used in this study are secondary data consisting of primary and secondary legal materials. Primary legal materials include binding regulations, such as the 1945 Constitution of the Republic of Indonesia, the Law on Public Information Disclosure, the Presidential Regulation on SPBE, and the Presidential Regulation on JDIHN. Meanwhile, secondary legal materials include legal textbooks, national and international scientific journal articles, previous research results, and official government reports relevant to the digitalization of regional governance. Data collection was conducted through library research by searching physical and digital documents through cyber-based databases (Johnny, 2008).

All collected legal materials were then selected, classified, and analyzed qualitatively using descriptive-analytical methods. The author performed data reduction to filter the relevance of the information, then presented it systematically to illustrate the empirical reality and challenges of digitalizing regional regulations in Indonesia. Finally, conclusions were drawn using deductive reasoning, namely drawing specific, practical, and solution-oriented conclusions from general legal premises, resulting in comprehensive optimization strategy recommendations for regional legal reform.

III. DISCUSSION

A. Analysis of the Urgency of Digitalizing Regional Regulations within the Legal Framework and Transparency

The digitalization of Regional Regulations (Perda) is no longer merely an optional technological innovation, but an absolute necessity for the transformation of regional governance in the modern era. Within the national

legal framework, the existence of Perda often faces classic challenges such as sectoral egos, overlapping regulations, and slow harmonization processes. Without an integrated digital system, monitoring the validity of a Perda against higher-level legislation—such as laws or government regulations—is extremely slow and prone to triggering future legal disputes (Jimly, 2021). Therefore, digitalization serves as an anchor for regulatory arrangements to create strong legal harmonization between the central and regional governments.

Poor accessibility of legal data has long been a source of legal uncertainty at the regional level. When a regional regulation is stored only in physical archives or static digital formats scattered across various poorly maintained government websites, businesses, legal practitioners, and the public struggle to verify its validity. This information barrier often leads to policy implementation errors or even illegal levies that exploit public ignorance. By digitizing regional regulations into a single, integrated and easily accessible database platform, regional governments are indirectly eliminating the gray area that fuels this legal uncertainty.

From a transparency perspective, the digitization of regional regulations is a concrete manifestation of the mandate for public information disclosure as stipulated in national legal instruments. Transparency goes beyond simply providing documents after the regulation is enacted, but also opens up opportunities for public involvement from the planning and discussion stages of draft regulations (Raperda). Through an e-government-based digital system, the public can review, provide input, and monitor draft regulations in real time. This two-way communication pattern not only increases accountability in legal formation but also minimizes the potential for massive rejection or future judicial review, as public participation has become meaningful.

Furthermore, the digitization of regional regulations plays a crucial role in supporting the ease of doing business in various regions. Investors require fast, accurate, and predictable regulatory certainty before investing in an area. If regional regulation documents related to spatial planning, levies, or permits are not digitally accessible and transparent, the investment decision-making process will be hampered by bureaucratic red tape (Bintan, 2022). Integrating regional regulations into national digital systems

such as the National Legal Documentation and Information Network (JDIHN) will create a healthy, competitive investment climate free from detrimental information asymmetries.

The urgency of digitalization has become even more pressing following the implementation of the concept of codification and regulatory simplification in recent years in Indonesia. Rapid changes in central-level regulations require local governments to adapt and promptly update their applicable regional regulations. If this process still relies on analog or manual mechanisms, the time lag between changes to central law and adjustments to regional law will be very long. Digitalization, particularly utilizing artificial intelligence in article tracking, can automatically detect which regional regulation clauses are no longer aligned with the latest regulations above them.

Beyond the legal substance aspect, the digitization of regional regulations has a significant impact on bureaucratic efficiency within regional governments themselves. Legislative processes involving the Regional People's Representative Council (DPRD) and the Regional Head are often time-consuming due to the lengthy bureaucratic chain of physical documents. By implementing e-legislation, the entire coordination process, draft corrections, and electronic signing can be conducted online while maintaining equal legal validity. This not only reduces document printing costs (a paperless alternative) but also accelerates the implementation of regulation-based regional government work programs.

However, the implementation of digitalization of regional regulations on the ground still faces serious challenges in the form of inter-regional digital inequality. Large urban areas generally have established JDIH (Regional Digital Information System), while remote or island areas often face challenges in network infrastructure and the quality of human resources (HR) for data management (Soerjono, 2017). Facing this reality, the Ministry of Home Affairs and the Ministry of Law and Human Rights need to strengthen their supervisory function and standardize uniform digital infrastructure. Digitalization must not widen the legal justice gap, but rather act as a bridge to ensure equal access to justice for every citizen, regardless of location.

In conclusion, digitizing regional regulations is not simply transferring text from paper to a computer screen, but rather a fundamental

restructuring of how laws are produced, published, and enforced. The presence of a transparent and accountable digital system will strengthen the rule of law at the regional level and restore public trust in local legal products. When regional laws are accessible at the touch of a button, legal certainty will be upheld, transparency will be realized, and clean governance will no longer be a bureaucratic utopia.

B. Analysis of Challenges in Implementing Digitalization of Regional Regulations

The digitization of Regional Regulations (Perda) is a strategic step towards achieving transparent and accountable governance. However, in practice, this agenda faces significant challenges in the form of disparities in information and communications technology (ICT) infrastructure across Indonesia. Regions outside Java, particularly in the remote, frontier, and outermost (3T) regions, often struggle with fundamental issues such as limited internet access and inconsistent electricity supply (Onno, 2022). This condition causes digitalization platforms, such as the Legal Documentation and Information Network (JDIH), to be inaccessible or incapable of being optimally updated, thus hampering the essence of equal access to legal information.

The second, equally crucial challenge is the low capacity and digital literacy of human resources (HR) within local government. Managing a digital-based regulatory system requires personnel who not only understand the legal substance but also are proficient in operating and securing data systems. In reality, many Regional People's Representative Council (DPRD) secretariats or local government legal departments lack competent computer technicians or data technicians. As a result, websites and regional regulation databases are often neglected, rarely updated, and even prone to technical errors in document uploads, potentially leading to misinformation for the public.

In addition to infrastructure and human resource issues, resistance to changes in work culture (cultural resistance) within the bureaucracy also slows the pace of this transformation. Analog work patterns that rely on physical documents and face-to-face bureaucracy have been deeply entrenched in government for decades. The transition to e-legislation or electronic signature-based validation systems is often met with suspicion or perceived as complicated by some regional officials (Edmon,

2020). This reluctance to leave the comfort zone triggers a lack of political commitment from regional leaders, which ultimately results in the digitalization program being considered merely a formality project without systemic integration into daily workflows.

From a legal and technical perspective, the lack of standardized data formats and sectoral egos between institutions pose significant obstacles to regulatory integration. Each region, or even agencies within regions, sometimes develops its own applications or database systems without considering interoperability. Uploaded document formats often vary—from low-resolution scanned PDFs that cannot be read by search engines to documents without a clear numbering index. This lack of uniformity complicates data integration at the national level, such as into the JDIHN system managed by the Ministry of Law and Human Rights.

Cybersecurity is also a real threat looming over the digitalization of regional regulations. Regional government websites, including legal portals, are often easy targets for cyberattacks such as hacking, defacement, and data theft. If a regional legal portal is successfully infiltrated, there is a risk of manipulation of regulatory texts or public documents by irresponsible parties (Edmon, 2020). Considering that regional regulation documents have binding legal implications and contain sanctions and citizen rights, leaks or illegal changes to these digital documents can undermine legal legitimacy and trigger civil and criminal disputes in society.

Finally, financial sustainability is a challenge that determines the life or death of this digital innovation. Early application development and hardware procurement often utilize grants or large capital expenditure allocations, but regions often neglect maintenance costs in subsequent years. When maintenance budgets are cut or no longer a priority in the regional budget, digital systems gradually become outdated, incompatible with modern devices, and ultimately become paralyzed. Without a long-term budget commitment, digitalization of regional regulations will become mere digital artifacts that fail to provide a sustainable impact on public transparency.

C. Analysis of Opportunities and Strategies for Optimizing the Digitalization of Regional Regulations

Amidst the rapid development of information technology, the digitization of Regional

Regulations (Perda) presents a golden opportunity to revolutionize the regulatory landscape at the local level. The greatest opportunity lies in leveraging artificial intelligence and cloud computing to address the issues of hyper-regulation and overlapping regulations. By integrating natural language processing (NLP) algorithms, local governments have a unique opportunity to automate legal regulation. Future digital systems will function not merely as static storage containers but as analytical tools capable of instantly detecting conflicts between new Perda and higher-level regulations.

This opportunity is also directly proportional to the increasing internet penetration and use of smartphones among the public, which can be optimized as a means of strengthening meaningful public participation. Widespread public access to draft regional regulations (Raperda) through mobile apps or interactive portals paves the way for the creation of inclusive feedback mechanisms (Maria, 2020). Optimization strategies in this area can be implemented by providing comment columns for each article, digital polls (e-polling), and virtual public consultation spaces. This approach not only increases the regional transparency index but also minimizes the potential for social resistance after the regulation is ratified and enacted.

To seize this opportunity, the primary strategy that must be implemented is standardizing legal data architecture and strengthening system interoperability under the One Data Indonesia policy. Regional governments must abandon sectoral egos by aligning their legal documentation formats to be compatible with national systems such as the National Legal Documentation and Information Network (JDIHN). The use of structured, metadata-rich, and machine-readable document formats will facilitate cross-regional document search. This standardization is a crucial foundation for legal data at the district/city level to be retrieved in real time by central ministries for the benefit of national harmonization.

The next strategy is to restructure human resource (HR) competencies by establishing special functional positions that bridge the legal and information technology sectors. Given the limited ICT skills of regional officials, regional governments need to foster strategic collaboration with local higher education

institutions and the private sector through a triple helix model. Intensive training on data governance, basic cybersecurity, and digital legal content management should be provided regularly to legal staff at regional secretariats and regional legislative councils (DPRD). This step is crucial for transforming the bureaucratic work culture from a paper-based to a fully digital-first culture.

In addition to internal capacity, data protection through strengthening cybersecurity infrastructure is an optimization strategy that cannot be overlooked. Given that local governments' digital portfolios are frequently targeted by hackers, implementing technologies such as end-to-end encryption and the use of electronic certificates for digital signatures is a legal imperative (Onno, 2022). The adoption of Distributed Ledger Technology (DLT) or blockchain also offers significant potential for implementation to ensure the authenticity of regional regulation documents, ensuring that regulatory documents accessed by the public are valid and free from the risk of manipulation or illegal modification by third parties.

Finally, this digital sustainability strategy must be supported by a long-term budgeting commitment that focuses not only on initial procurement (capital expenditure) but also on maintenance and innovation costs (operational expenditure). Regional governments must consistently incorporate the maintenance agenda for the JDIH system and supporting legislative applications into regional planning documents such as the Regional Work Plan (RKPD) and Regional Budget (APBD). By linking the level of regulatory digitization to the Bureaucratic Reform Index evaluation and the provision of fiscal incentives from the central government, regional motivation to maintain the sustainability of digital platforms will be maintained for the sake of transparent public services and legal certainty.

IV. CONCLUSION AND SUGGESTIONS

A. Conclusion

The digitalization of Regional Regulations (Perda) is a fundamental pillar in the transformation of regional governance, aligning it with the principles of the rule of law and public transparency. The presence of an integrated digital system has proven effective in reducing sectoral egos, accelerating legal harmonization, and eliminating gray areas that have fueled legal

uncertainty and hampered the investment climate in the regions. More than simply transferring documents from paper to screen, digitalization is an instrument for realizing meaningful public participation and real bureaucratic efficiency.

However, the effectiveness of this transformation remains hampered by various structural challenges on the ground. Disparities in ICT infrastructure across regions, limited competency and digital literacy among civil servants, and resistance to an analog work culture are all stumbling blocks that slow the rate of system adoption. Furthermore, the lack of uniform data formats (interoperability), cybersecurity vulnerabilities in regional legal portals, and the lack of long-term maintenance budget commitments have prevented the sustainable implementation of many digital innovations in the regions.

Opportunities for optimization are now wide open with the rapid development of cloud computing technology, artificial intelligence (AI) for automated regulatory analysis, and blockchain technology to ensure document authenticity. Through strong political commitment, standardized data architecture aligned with the national JDIHN (National Data and Information System), and strengthened cybersecurity, the digitization of regional regulations can be developed from mere static storage into a dynamic, secure, transparent, and fully legally certain local digital legal ecosystem.

B. Suggestions

The suggestions in this research are as follows:

- a. The central government, through the Ministry of Home Affairs and the Ministry of Law, together with regional governments, must immediately finalize the standardization of machine-readable legal data formats. Full integration into the national JDIHN portal must be mandatory to ensure real-time access to regional regulation documents across the country, without the constraints of sectoral egos.
- b. Regional governments need to restructure their civil service competencies by creating or optimizing functional positions that master both legal aspects and information technology (IT).

- Collaboration with local university academics (the triple helix approach) should be encouraged to provide regular training on digital legal data governance and cyber literacy.
- c. Strict cybersecurity standards are needed on regional legal portals, including mandatory use of certified electronic signatures and data encryption. Regional governments can also begin exploring the adoption of Distributed Ledger Technology (DLT) or blockchain to protect digital copies of regional regulations from the risk of manipulation or hacking by third parties.

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