

# Legal Interoperability Issues Between the Online Single Submission System and the National Land Database Infrastructure

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*data validation authorities, harmonizing cross-sectoral regulations, and strengthening risk management-based governance within the SPBE ecosystem. This approach is expected to create system integration that is not only technically efficient but also aligns with the principles of legal certainty and the protection of land rights.*

**Abstract:** *The digital transformation of the business licensing system through the Online Single Submission (OSS) has brought significant changes to government administration, including integration with the national land database. This integration is expected to accelerate public services and increase investment efficiency, but in practice, it presents various legal problems related to data validity, regulatory disharmony, and ambiguity in administrative responsibilities between institutions. The differences in character between the self-declaration mechanism in the OSS and the formal verification system in land administration give rise to potential legal data conflicts that can impact the certainty of land rights. This study seeks to analyze the configuration of the OSS system interoperability with land data, identify emerging normative conflicts, and formulate an ideal legal interoperability design to support legal certainty and protect community rights. The research method employed is normative legal research with a statutory, conceptual, and systems approach, through qualitative analysis of primary and secondary legal materials. The results show regulatory fragmentation between the investment acceleration regime and the precautionary principle in agrarian law, as well as the absence of clear legal standards regarding the hierarchy of data validity between government digital systems. This situation has the potential to trigger administrative errors, overlapping permits, and conflicts over digital data-based space. The ideal legal interoperability model is focused on establishing a legal validation layer, standardizing*

**Keywords:** *legal interoperability; OSS; land database; legal validation; legal certainty; SPBE*

## Introduction

Digital transformation has transformed the direction of public administration across various sectors, including land and business licensing (Adinegoro, 2023). The Indonesian government is promoting digitalization as a strategy to increase efficiency, transparency, and accountability in public services through information technology-based systems (Choirunnisa et al., 2023). Bureaucratic reform is no longer merely about restructuring organizational structures but also streamlining administrative processes through electronic data integration. Digital systems are seen as capable of reducing layered bureaucratic

practices and accelerating administrative decision-making (Renanda & Rosidin, 2025). These changes present both opportunities and challenges, as the law must adapt to technological processes that differ from conventional systems.

The implementation of digitalization in the licensing sector is being realized through the introduction of the Online Single Submission (OSS) as an integrated platform that integrates various licensing services across ministries and agencies (Rokhman et al., 2024). The OSS is designed to streamline the licensing process by utilizing centrally accessible electronic data. The concept of risk-based licensing is the main foundation of this system, ensuring that the level of supervision and administrative requirements are aligned with the potential risks of business activities (Feliks et al., 2025). Cross-sector integration requires the OSS system to obtain valid and synchronized data from various agencies, including land data. Challenges arise when this integration confronts sectoral systems with differing legal and technical standards (Hidayatullah et al., 2025).

The national land database infrastructure was developed through a lengthy process rooted in the traditional agrarian administration system. Land data has a legal-formal character because it is directly related to the status of land rights, which are protected by law (Lestari, 2025). Land digitization is being carried out gradually through computerized land management systems, digital maps, and the development of electronic certificates (Masri, 2023). Every change to land data has significant legal consequences because it concerns land ownership and use. These characteristics make the land system tend to be cautious in integrating with external platforms (Khair & Assyahri, 2024).

The differences in approach between the OSS and the land database system create unique dynamics in the integration of government digital services. The OSS (Online Single Submission) is designed to expedite administrative processes, while the land system emphasizes strict legal validation (Mayasari, 2025). Integration without harmonization of norms has the potential to create conflicts over data validity. When information used in the licensing process differs from official land data, the risk of administrative errors increases. This situation raises questions about the legal hierarchy of data used in government digital systems.

The issue of legal interoperability has emerged as a central issue that requires in-depth analysis. Interoperability concerns not only the ability of technological systems to connect with each other but also the compliance of legal regulations governing the use of that data (Siregar & Nasution, 2025). Interconnected digital systems require a shared understanding of validation standards, administrative responsibilities, and legal protection for affected parties (Judijanto, 2025). Inconsistencies in norms can hinder the effectiveness of integration and create legal uncertainty. The urgency of research on legal interoperability lies in maintaining a balance between accelerating services and protecting rights.

Interoperability in digital governance has several layers that need to be conceptually distinguished. Technical interoperability relates to the ability of systems to exchange data using compatible technologies (Maulana, 2025). Semantic interoperability relates to the similarity of meaning and data structure so that information can be understood uniformly by various systems. Legal interoperability relates to the compatibility of regulations, procedures, and administrative authorities that enable the legitimate use of data (Judijanto,

L., 2025). These three layers are interrelated and inseparable when building a government digital ecosystem.

The principle of interoperability in e-government emphasizes the importance of efficient and legally secure integration of public services. Modern governments strive to create systems capable of connecting various databases without diminishing the authority of each institution (Zein & Septiani, 2024). Integration is not only related to service efficiency but also to maintaining data integrity and accountability in decision-making. The use of digital technology expands the government's capacity to provide integrated services (Maryuni et al., 2024). The main challenge lies in ensuring that this integration remains aligned with the principles of state administrative law.

Legal architecture is a crucial concept in understanding the integration of government digital systems. Legal architecture refers to the design of norms and procedures that govern interactions between systems and the division of institutional authority (Wibowo, 2025). Digital systems cannot function optimally if supported solely by technological infrastructure without a clear legal basis. Developing a sound legal architecture helps avoid conflicts of authority and ensures that all data has legal legitimacy. This approach also opens up space for the development of consistent national standards for public data management.

The theory of legal certainty has strong relevance in the land system because land rights require clear guarantees of protection (Widad, 2026). The principle of publicity through land registration aims to provide open information regarding ownership status, thereby reducing disputes. Land data serves as a means of proof with certain legal force in the state administrative system (Julaeha, 2026). Digital data integration must maintain these principles to avoid diminishing the legal evidentiary value inherent in land documents. Technological change requires regulatory adaptation without sacrificing the guarantee of legal certainty.

The state's role in ensuring legal certainty becomes increasingly complex as public services shift to digital platforms. The state acts not only as a regulator but also as the administrator of the technology system that manages public data (Nainggolan et al., 2024). Data integration errors can directly impact individual rights, particularly in the land sector, which has high economic and social value. The state's obligations include providing correction and accountability mechanisms for administrative errors. An adaptive legal approach must prevent digitalization from creating new uncertainties.

The concept of risk-based licensing presents a new paradigm in public services by adjusting the intensity of supervision based on the risk level of business activities. This system requires accurate data as a basis for administrative decision-making (Julianti, 2024). Cross-sector data integration is key to ensuring objective and efficient risk assessments. Digital governance drives changes in bureaucratic work patterns toward a more responsive and integrated system (Gani & Jaya, 2025). This change requires harmonization between the technology system and the legal framework to ensure the goal of accelerating services remains aligned with rights protection and legal certainty.

## Methodology

This research employs a normative legal research method with a conceptual approach, statutory regulations, and a systems approach focused on analyzing legal

integration within the digital licensing and land ecosystem. The study was conducted through a review of primary legal materials, including laws and regulations related to the OSS (Online Single Submission), land administration, spatial planning, and the latest regulations, including policy changes replacing Government Regulation No. 5 of 2021 with Government Regulation No. 28 of 2025. It was supported by secondary legal materials such as academic literature, scientific journals, and doctrines on state administrative law and agrarian law. The analysis was conducted qualitatively by examining norm conflicts, legal data hierarchies, and the construction of administrative responsibilities between institutions within the government's digital system. The analytical approach identifies regulatory gaps and legal interoperability issues, while the prescriptive approach aims to formulate an ideal legal interoperability design model that emphasizes legal validation layers, regulatory harmonization, and risk management-based governance to strengthen legal certainty and protect land rights.

## **Result and Discussion**

### **OSS and Land Database Interoperability Configuration, and Regulatory Framework**

The Online Single Submission (OSS) system architecture is designed as an integrated platform aimed at simplifying the business licensing process through cross-sectoral service integration. This system combines various licensing modules from ministries, agencies, and local governments into a single, interconnected digital ecosystem. The OSS serves as the primary gateway for businesses to apply for risk-based licensing in accordance with the provisions stipulated in Government Regulation Number 28 of 2025 concerning the Implementation of Risk-Based Business Licensing. The platform's structure is designed using an interoperability approach, enabling it to automatically retrieve and transmit data from various national databases. The system's existence requires readiness for sectoral data integration, including land data, which has special legal characteristics.

The OSS structure consists of several key components, such as a business registration module, a risk assessment system, a technical agency dashboard, and integration with digital identity services and sectoral databases. The platform relies on electronic data exchange to minimize manual input by businesses. Regulations governing the OSS mechanism include provisions in Government Regulation Number 28 of 2025, which emphasizes the use of electronic systems for licensing applications and issuance. The OSS is also linked to the Business Identification Number (NIB), the primary identification number for business actors, which serves as the gateway for various administrative services. This integration requires data uniformity across agencies to ensure effective verification.

The cross-agency data integration mechanism within the OSS relies on digital data exchange through specific interoperability standards. Each data provider agency acts as a data owner responsible for the validity of the information provided. The OSS functions as an orchestrator, facilitating data exchange through mutually agreed-upon information technology protocols. Provisions regarding the integration of electronic-based government services are regulated in Presidential Regulation Number 95 of 2018 concerning the Electronic-Based Government System (SPBE), specifically Article 3, which emphasizes the

principles of system integration and interoperability. This regulation provides the legal basis for data integration between agencies in digital public services.

The role of land data in the licensing process is crucial because it relates to the legality of business locations. The OSS requires spatial data and land rights status to ensure that business activities do not violate spatial planning provisions or agrarian law. Certain licensing processes require location verification based on official land data from the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN). This data is used to ensure land use suitability and avoid ownership conflicts or overlapping permits. The role of land data becomes increasingly strategic when the risk-based licensing system relies on the validity of location information as a key parameter.

The national land database infrastructure is developing through gradual digitization aimed at improving the accuracy and accessibility of agrarian information. The Computerized Land Activities System (KKP) is one of the backbones of modern land data management in Indonesia. The KKP is used to manage various administrative services, such as land registration, data changes, and electronic certificate issuance. The development of this system aligns with the public service digitalization policy stipulated in various ATR/BPN regulations. Integration with other systems requires strict security and validation standards because land data has direct legal consequences.

Digitizing land parcel maps is a strategic step to increase the transparency and accuracy of spatial information. Digital maps enable more precise land boundary identification than conventional methods. This spatial data serves as a crucial basis for spatial planning and business licensing processes. Integrating land parcel maps with the OSS system enables rapid analysis of business locations using geospatial technology. A major challenge arises when spatial data held by various agencies does not use the same standards.

The development of electronic certificates is part of the modernization of the national land system, aimed at improving service efficiency and document security. Electronic certificates are regulated through the ATR/BPN policy, which provides legal legitimacy to digital documents as proof of ownership. The transformation from physical certificates to digital certificates requires strengthening data security systems and electronic authentication mechanisms. The recognition of electronic documents as legal evidence is also supported by Law Number 11 of 2008 concerning Electronic Information and Transactions, as amended by Law Number 19 of 2016, specifically Article 5 paragraph (1), which states that electronic information has valid legal force. The change opens up opportunities for land data integration with other digital platforms.

The data integration mechanism between the OSS and the national land database uses an Application Programming Interface (API) for automated information exchange. The API allows the OSS system to retrieve required data without the need for repeated manual input. Data exchange via API requires mutually agreed-upon format standards and security protocols. Using this technology accelerates administrative processes, but also poses challenges in maintaining data consistency. The system must ensure that the retrieved data is up-to-date and legally verified.

The distinction between administrative validation and business actor declarations is a critical issue in the data integration mechanism. The OSS allows businesses to independently submit information through self-declarations, which are then verified by relevant agencies. The land system tends to use a formal verification approach that involves reviewing documents and field data. This difference in methods has the potential to lead to discrepancies between submitted data and official land data. Harmonization of procedures is necessary to ensure system integration does not compromise legal accuracy.

Different data standards across agencies often hinder the interoperability of government digital systems. Spatial data formats, area codes, and metadata structures can differ between the OSS and the land system. These differences can lead to misinterpretations or technical integration failures. Interoperability requires agreement on national standards that cover both technical and legal aspects. Strengthening national data standards aligns with the SPBE policy, which encourages the integration of technology-based services.

Current interoperability practices involve integrating the OSS with various ministerial systems, including the ATR/BPN. The integration process typically begins with a business actor's permit application, which is then verified through automatic data exchange. The OSS system utilizes land data to verify that the business location aligns with the land status. This process helps expedite permit issuance while reducing the need for manual verification. Implementation on the ground still faces challenges related to data quality and technological infrastructure readiness.

The potential for data mismatches is a common problem in digital system integration. Differences in data update times between the OSS and the land database can lead to a lack of synchronization of the information used. Another problem arises when there are changes in land status that have not yet been recorded in the integrated system. Data mismatches can lead to the issuance of permits that do not align with the actual legal status. The risk raises the demand for stronger validation mechanisms.

The challenges of implementing interoperability also relate to human resources and inter-agency coordination. Not all agencies have the same technological readiness, so system integration is carried out in stages. Differences in bureaucratic work cultures can affect the speed of digital system adoption. Training and capacity building of civil servants are crucial factors for successful integration. Cross-sectoral coordination efforts need to be supported by clear and consistent policies.

The land regulatory framework in Indonesia is rooted in Law Number 5 of 1960 concerning Basic Agrarian Regulations (UUPA). The UUPA regulates the basic principles of land ownership and use, as well as the state's authority to regulate agrarian legal relations. Derivative regulations from the ATR/BPN govern the land registration mechanism, certificate issuance, and land data management. The digital land system must remain aligned with the basic principles stipulated in the Basic Agrarian Law (UUPA). Legal certainty is a key principle that must be maintained in every land technology innovation.

The regulatory framework for risk-based business licensing is regulated by Law Number 11 of 2020 concerning Job Creation, as amended and re-established by Law Number 6 of 2023, and Government Regulation Number 28 of 2025 concerning the

Implementation of Risk-Based Business Licensing. The SPBE regulation, through Presidential Regulation No. 95 of 2018, provides the basis for the integration of electronic-based government systems, while the recognition of electronic information as legal evidence is regulated by the ITE Law. Government information governance is also supported by Law Number 14 of 2008 concerning Public Information Disclosure, which governs the accessibility of public data. The entire regulatory framework serves as the legal foundation for interoperability between OSS and the national land database.

### **Problem Analysis and Design of Legal Interoperability**

Data validity conflicts become a major issue when the self-declaration-based OSS system interacts with the land system, which prioritizes formal verification. Business actors are given the opportunity to independently enter data during the initial stages of permit applications through the OSS as part of a risk-based licensing approach. The land system has a stricter validation mechanism because it directly relates to the certainty of legally protected land rights. This difference in approach can lead to situations where the data used to issue permits has not undergone an adequate agrarian verification process. The tension between administrative efficiency and legal accuracy becomes the starting point for interoperability problems.

The legal hierarchy of data between systems is an issue that is often overlooked in depth. Data originating from the OSS can be considered administratively valid in the licensing process, while land data has stronger legal legitimacy because it is supported by the land registration system. When information discrepancies arise between the two systems, the question of which data has greater legal force becomes highly relevant. Indonesia's agrarian legal system, through Law Number 5 of 1960 and land registration regulations, places land data as the basis for proving rights. Digital integration requires explicit rules regarding the legal priority of data to avoid conflicts of interpretation.

The risk of permit errors due to data asynchronous processing is a practical consequence of these validity conflicts. Differences in data update times or input errors can result in business permits being issued on land with problematic legal status. Such errors have the potential to trigger disputes between permit holders and land rights owners. The knock-on impact can include economic losses and social conflicts that are difficult to resolve quickly. Digital systems designed to expedite services can actually increase risks if not supported by adequate legal validation mechanisms.

Regulatory fragmentation complicates the integration between the OSS (Online Single Submission) and the land system. Licensing regulations strive to emphasize the principles of accelerated investment and ease of doing business as part of the national economic development strategy. The land system is characterized by a cautious approach because it relates to property rights, which have long-term legal consequences. This difference in regulatory orientation creates an imbalance between administrative speed and rights protection. When the two systems are integrated without harmonization of norms, the potential for disharmony increases. Disharmony in norms is also evident in the overlapping authority between institutions involved in data integration. OSS is under the coordination of the ministry responsible for investment and licensing, while land data is under the

authority of ATR/BPN. Each institution has different operational standards and regulatory interpretations. Divergent perspectives can slow integration or even lead to administrative conflict. The need for cross-agency coordination mechanisms is becoming increasingly urgent.

The lack of norms regarding legal interoperability is a gap that requires serious attention. Existing regulations primarily address technical interoperability through SPBE policies, but do not yet provide detailed guidance on the legal integration of data between systems. The absence of norms governing validation priorities, legal responsibilities, and data conflict resolution mechanisms creates uncertainty. This situation demonstrates that government digitalization requires new legal designs that transcend sectoral approaches. Developing legal interoperability regulations is a key agenda for digital governance reform.

Ambiguity in administrative responsibility arises when errors occur due to digital data integration. The question of who is responsible becomes complex because it involves multiple agencies. Business actors may rely on data provided by the system, while the data-providing agency has its own authority. Unclear division of responsibility can hinder dispute resolution and harm the public. Determining liability needs to be explicitly formulated in interoperability regulations.

Accountability of government digital platforms has become a critical issue with the increasing use of electronic systems in public services. Digital platforms function not only as administrative tools but also as data-driven decision-making mechanisms. Algorithmic or data integration errors can directly impact individual rights. The government needs to ensure a transparent system of audits and correction mechanisms. The principles of good governance demand clear accountability in digital system management.

Legal protection for land rights holders must be a priority in interoperability design. Data integration must not diminish the legal certainty inherent in the land registration system. Rights holders need assurance that land data used in the licensing process is not misused or misinterpreted. Mechanisms for objections or data corrections must be easily accessible to the public. This protection is the foundation of public trust in the government's digital system.

The impact on land rights certainty can be seen in the risk of overlapping permits arising from suboptimal integration. Business permits issued without thorough validation can conflict with registered land rights. Such conflicts have the potential to increase the number of agrarian disputes involving various parties. Digital systems should be able to reduce conflict, but without an appropriate legal design, they can actually increase the complexity of the problem. System integration requires an approach that prioritizes legal certainty.

Spatial conflicts and agrarian conflicts based on digital data are new phenomena emerging with the digitalization of administration. Unsynchronized spatial data between various agencies can result in differing interpretations of locations. These differences can trigger disputes between businesses, communities, and local governments. Digitization should improve the accuracy of spatial information, but the reality of implementation often

faces limitations in data standards. Harmonization of geospatial systems is a crucial part of the interoperability solution.

The implications for the land registration system cannot be ignored. Integration with the OSS can impact how land data is used in other administrative processes. The land registration system, which has historically been conservative, must adapt to the need for real-time data exchange. This adaptation requires procedural changes without compromising the principle of agrarian prudence. An immature integration design has the potential to weaken the evidentiary value of land data.

The ideal legal interoperability design model requires the introduction of a legal validation layer as an additional layer in system integration. This layer serves to ensure that all exchanged data meets specific legal standards before being used in decision-making. The approach supports minimizing the risk of administrative errors. The legal validation layer can also serve as a control mechanism to maintain data quality. Implementing this concept requires a clear regulatory framework.

Standardizing data authority and validation authority is a crucial step to avoid conflicts between agencies. Each type of data needs to have a clear responsibility for its validity and updating. Establishing national standards regarding validation authority can reduce ambiguity in administrative responsibilities. Coordination between agencies should be formalized through binding legal mechanisms. This standardization supports the creation of a more stable digital ecosystem.

Risk management-based interoperability governance offers a more adaptive approach to the complexity of system integration. Risk analysis can be used to determine the level of validation required for each type of permit. This approach aligns with the risk-based licensing concept implemented in the OSS. Harmonization of cross-sectoral regulations is a crucial element for the consistent application of risk management. Risk management helps balance the need for accelerated service delivery with the protection of rights.

Synchronizing legal and spatial data standards and strengthening institutional coordination are the final components of an ideal interoperability design. Uniform data standards enable more accurate and efficient information exchange. Institutional coordination extends beyond technical aspects to policy alignment and legal interpretation. The government's digital ecosystem requires ongoing communication mechanisms between institutions. Strengthening collaborative governance can lay the foundation for sustainable legal interoperability.

## Conclusion

The relationship between the OSS system and the land administration system presents problems rooted in differences in data validation paradigms and administrative authority structures. The self-declaration mechanism promoted by the OSS accelerates the licensing process but has the potential to create inconsistencies when compared to the formal verification model that is the primary characteristic of land administration. The fragmentation of regulations across sectors demonstrates a disharmony in norms, resulting in overlapping authority and blurred boundaries of administrative responsibility. This

ambiguity of responsibility creates uncertainty for land rights holders and business actors, particularly when data integration errors occur between government digital systems. The implications for legal certainty relate not only to the legality of documents but also to spatial stability and the potential for agrarian conflicts based on increasingly complex digital data. An urgent need arises to develop a legal interoperability design capable of bridging differences in system logic, strengthening legal validation, and consistently integrating legal and spatial data standards across sectors.

Strategic steps that can be taken include establishing a legal validation layer as a filtering mechanism that ensures that all integrated data has undergone adequate legal verification. Cross-sectoral regulatory harmonization should be directed at aligning the principles of accelerated investment with the principle of agrarian prudence through revised norms that provide certainty regarding data validation authorities. Strengthening interoperable governance based on risk management is crucial for mapping potential digital integration risks and establishing clear administrative responsibilities between institutions. Standardizing legal and spatial data formats can minimize system misinterpretation and improve technical and normative interoperability. More intensive institutional coordination between technical ministries, land agencies, and OSS system administrators is expected to create a digital ecosystem that is not only fast but also accountable and provides adequate legal protection for all relevant parties.

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