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Abstract

Digital transformation in public services is an urgent need in realizing efficient and transparent governance, including in the field of immigration. The Directorate General of Immigration has implemented the Online Residence Permit Service System as part of the reform of residence permit services for foreign nationals. Batam City as a strategic area with high mobility of foreigners becomes an important locus in assessing the effectiveness of the system. This study is motivated by the importance of legal certainty, service efficiency, and protection of legal rights of foreign nationals in the process of applying for a digital residence permit. This study aims to analyze legal arrangements, implementation of online residence permit service system, as well as obstacles and solutions faced in improving the quality of immigration services in Batam City. The methods used are normative juridical and empirical juridical approaches with data collection techniques through document studies (secondary data) and interviews (primary data) with immigration officers, foreign service users, and other related parties. The results show that the online residence permit service system has a strong legal basis, but there are still gaps between regulations and practices in the field. The main obstacles include limited technological infrastructure, low user digital literacy, and suboptimal cross-sectoral coordination. In terms of implementation, this system has improved administrative efficiency, but has not fully guaranteed legal certainty and service satisfaction. It is recommended that the Directorate General of Immigration and Batam Immigration Office strengthen human resource capacity, improve infrastructure, prepare technical operational guidelines, and expand public education to service users. With these steps, the system is expected to run more effectively, adaptively, and in line with the principles of good administrative law.

Keywords: Immigration System, Online Stay Permit, Digital Public Service, Legal Effectiveness, Batam City, Foreign Citizens.

1. Introduction

The Online Stay Permit System (OSPS) has emerged as one of Indonesia's most ambitious initiatives to modernize immigration services. Batam, a rapidly growing industrial and tourism hub located near Singapore and Malaysia, is a strategic testing ground for this policy due to its high volume of foreign travelers, expatriates, and investors [1]. Traditionally, stay permit services involved manual applications requiring physical attendance at immigration offices. These processes were time-consuming, prone to administrative errors, and occasionally marred by inconsistent interpretations of regulations. The OSPS was introduced to reduce such inefficiencies by digitizing the application and monitoring processes. Legally, the OSPS finds its basis in Law No. 6 of 2011 on Immigration, which recognizes electronic services as valid means of administration, and Ministerial Regulation No. 27 of 2014, which provides operational guidelines for stay permit applications. The system's goal is to improve service transparency, enhance legal certainty, and align with broader e-government reforms. By leveraging technology, the government seeks to minimize direct contact, reduce opportunities for corruption, and make the system more accessible for foreign nationals and sponsors [2]. Despite these advantages, several issues affect the system's effectiveness. Batam's immigration offices often face technical challenges, including server downtime, poor integration with other databases,

Nanda Horas Pranata et al

and delays caused by inadequate IT infrastructure. These technical barriers are compounded by human factors such as insufficient staff training, resistance to change, and inconsistent enforcement of regulations. Foreigners have reported difficulties in navigating the system, unclear guidance, and lack of real-time support. The OSPS also raises important questions about legal protection and accountability. While regulations exist, there are gaps in addressing liability for system failures, data protection, and enforcement mechanisms. The increasing reliance on digital services means that personal data, including sensitive information, must be protected according to the Personal Data Protection Law (Law No. 27 of 2022) [3]. Failure to secure this data can compromise public trust and harm the country's international reputation. This research aims to analyze the juridical effectiveness of the OSPS in Batam by examining the gap between legal frameworks and actual practice. A juridical-empirical approach is adopted, combining normative legal analysis with empirical observation and stakeholder interviews. The study identifies strengths and weaknesses in implementation, compares Batam's system to similar services in neighboring countries, and offers recommendations for improving system integrity, efficiency, and compliance. By addressing these gaps, the OSPS can contribute significantly to legal certainty, investor confidence, and the broader goals of digital transformation in Indonesia [4].

2. Literature Review

2.1. Legal Framework of Stay Permits and Digitization

Indonesian immigration law provides a comprehensive legal foundation for regulating the entry, stay, and exit of foreign nationals. Law No. 6 of 2011 on Immigration is the main legal instrument, defining stay permits as essential administrative tools to maintain state sovereignty and manage foreign mobility [5]. This law categorizes permits into several types: visit permits for short-term stays, limited stay permits for medium-term purposes like work or study, and permanent stay permits for long-term residency [6]. Each category has distinct conditions and durations, reflecting different policy objectives. To improve administrative efficiency and transparency, the Ministry of Law and Human Rights issued Ministerial Regulation No. 27 of 2014, which formally allows electronic applications and management of stay permits. This regulation legitimizes the Online Stay Permit System (OSPS) as part of Indonesia's broader e-government strategy. Legal scholars argue that digital platforms like OSPS can minimize human discretion, which is often a source of inconsistency or even corruption. Digitization improves record-keeping, ensures that applications are timestamped and traceable, and supports accountability. However, some experts caution that the absence of detailed operational standards and guidelines for implementation can lead to misinterpretation and uneven enforcement across regions. In Batam, a busy immigration point, this is particularly critical because the volume of foreign applicants magnifies any procedural gaps.

2.2 Compliance and Enforcement Challenges

Enforcement is another critical theme in the literature. P. M. Hadjon's concept of preventive and repressive legal protection is especially relevant. Preventive measures focus on building systems that reduce the risk of violations: clear regulations, robust verification tools, and public education. Repressive measures involve enforcing sanctions, investigating irregularities, and prosecuting offenders when rules are broken. In Batam, preventive strategies such as simplified interfaces and public information campaigns are still developing. Meanwhile, repressive enforcement, such as penalties for overstays, is inconsistently applied Scholars warn that trust is a major factor. If users perceive the system as unreliable or opaque, they may avoid it or resort to informal channels [7]. Therefore, ensuring transparency, prompt responses to errors, and fair application of sanctions is key to strengthening compliance.

2.3 Data Protection and Legal Certainty

Digitized immigration systems necessarily involve collecting sensitive personal data. The OSPS must therefore comply with privacy and cybersecurity regulations. Indonesia's Personal Data Protection Law (Law No. 27 of 2022) and the Electronic Information and Transactions Law (ITE Law) establish principles for data processing, retention, and security [14]. Experts such as Jimly Asshiddiqie stress that legal certainty and data integrity are vital, not only for protecting individuals but also for maintaining public trust and state security [8]. Nevertheless, gaps remain. Not all immigration staff are fully trained on handling data breaches, applying retention schedules, or managing inter-agency data sharing. Technical safeguards like encryption, access controls, and audit trails are being introduced but need further strengthening. As Batam processmetes large volumes of foreign applicants, vulnerabilities in these areas could have amplified consequences. Overall, the literature suggests that while the OSPS is supported by a sound legal

Nanda Horas Pranata et al

framework and aligns with digital governance theory, its success depends on robust enforcement, cultural adaptation, technical resilience, and continuous capacity building.

3. Methodology

This research uses a combination of normative and empirical juridical approaches to comprehensively analyze the effectiveness of the Online Stay Permit System for foreigners in Batam City. The normative juridical approach examines laws, regulations, and legal principles governing immigration services and electronic-based governance in Indonesia. It includes a detailed study of Law No. 6 of 2011 on Immigration, Presidential Regulation No. 95 of 2018 on the Electronic-Based Government System (SPBE), ministerial regulations on residence permits, and other related legal instruments[9]. Through this approach, the research identifies the legal basis of the system, evaluates whether it conforms to administrative law principles, and determines if it ensures legal certainty for foreign nationals applying for stay permits. To complement the normative analysis, the empirical juridical approach is applied to assess the practical implementation of the system in Batam. This approach focuses on how regulations are enforced and whether the intended objectives, such as efficiency, transparency, and accountability, are achieved in practice[9]. By combining these two approaches, the research bridges the gap between law as written (law in the books) and law as implemented (law in action), which is critical for understanding the real effectiveness of the Online Stay Permit System.

The research design is descriptive and analytical. It is descriptive because it aims to depict the current state of the legal framework and the operational practices of the system. At the same time, it is analytical because it critically evaluates the alignment between normative provisions and empirical findings, highlighting inconsistencies and identifying solutions to address legal and practical challenges[10]. This dual nature allows the research to go beyond mere description and provide actionable recommendations for improving the system. Data for the study were obtained from two main sources: primary and secondary data. Primary data were collected through semi-structured interviews and observations. Interviews were conducted with immigration officers at the Batam Immigration Office, officials from the Directorate General of Immigration, and foreign nationals who have used the Online Stay Permit System. These interviews explored experiences, perceptions, and challenges encountered by both service providers and users. Observations were carried out to understand the operational environment, including the infrastructure available at the immigration office and how staff members handle online applications. Secondary data consisted of legal documents, official reports, academic literature, and previous research related to immigration law, public administration, and digital governance[5]. These documents provided the normative foundation and theoretical context for analyzing the research problem.

The process of data collection employed several techniques. First, documentary study was conducted by reviewing relevant laws, regulations, government policies, and academic writings on digitalization of public services and immigration law. Second, in-depth interviews were chosen as the primary method for collecting empirical data because they allow for detailed exploration of participants' experiences and insights, which are essential for understanding complex administrative processes[11]. Third, direct observation was used to capture real-time practices and identify potential discrepancies between written procedures and actual implementation. Observations focused on the technical functioning of the system, staff-user interactions, and the overall workflow of online stay permit applications. The data analysis method applied in this research is qualitative. For normative data, legal interpretation techniques such as grammatical, systematic, and teleological interpretation were used to understand the meaning and purpose of relevant legal norms. For empirical data, the analysis followed an interactive model consisting of three steps: data reduction, data display, and conclusion drawing. Data reduction involved categorizing and summarizing information obtained from interviews and observations. Data display presented the findings in a narrative format to facilitate the comparison between normative expectations and actual practices. Finally, conclusions were drawn and verified through triangulation, ensuring the reliability and validity of findings.

4. Results and Discussion

4.1 Implementation of the Autogate System in Batam

The introduction of the autogate system in Batam's international ports represents a significant step toward modernizing immigration processes, aiming to streamline passenger flow and enhance overall operational efficiency. Observations during peak travel periods indicate that foreign travelers who utilize the autogates experience markedly shorter waiting times compared to those undergoing manual clearance. This reduction in queuing not only improves passenger satisfaction but also mitigates congestion, which has historically been a critical challenge in high-traffic

Nanda Horas Pranata et al

ports. Immigration officers have reported that the system allows them to prioritize attention toward travelers requiring manual verification, thereby improving risk management and focusing resources on individuals flagged for additional checks.

Despite these benefits, the implementation remains partial. Not all passengers are eligible to use the autogates due to restrictions such as nationality, age, or validity of travel documents, creating a dual-track clearance system. This duality has operational implications: while some travelers enjoy expedited processing, others still face traditional manual verification, resulting in uneven service delivery. Such partial implementation highlights the system's limitations in achieving full operational integration, Moreover, technical observations indicate occasional bottlenecks at the transition points between manual and automated processes, demonstrating that infrastructure adjustments are necessary to support seamless operation. Furthermore, the introduction of the autogate system requires adaptation by both travelers and immigration staff. For travelers unfamiliar with automated processes, initial usage can be confusing, leading to hesitation or errors during biometric scans. Immigration personnel must provide guidance and manage these interactions while maintaining overall efficiency. Training programs for staff have been implemented but vary in depth and frequency, which affects operational consistency. Additionally, the system relies heavily on stable technical infrastructure, including biometric scanners and software, making it susceptible to downtime or malfunction, which in turn disrupts the intended efficiency gains.[11] In conclusion, the autogate system in Batam demonstrates a successful step toward technological modernization of immigration procedures, offering clear advantages in speed and resource allocation. However, its partial implementation, dual-track clearance, and reliance on well-trained personnel and robust infrastructure underscore that while the system is effective in certain contexts, it is not yet fully comprehensive. Future development should focus on expanding eligibility, integrating manual and automated processes, and enhancing training and infrastructure to maximize the system's potential benefits.

4.2 Legal and Juridical Gaps

From a legal perspective, the autogate system in Batam operates within an ambiguous regulatory framework. Existing legislation, such as Law No. 6 of 2011 concerning Immigration and Ministerial Regulation No. 44 of 2015, provides general guidance on immigration procedures and checkpoint operations, but it does not specifically address the use of biometric-based clearance systems. This legislative gap creates uncertainty about the legal status of automated processing, particularly regarding the collection, storage, and use of sensitive personal data. The absence of explicit regulations weakens legal certainty and raises questions regarding the protection of travelers' rights, especially when their biometric information is involved. Empirical findings from interviews with travelers indicate that while they appreciate the efficiency of the autogate system, many are concerned about the transparency and security of their personal data. Questions arise about who has access to the biometric information, how long it is retained, and what mechanisms are in place to prevent unauthorized use or breaches. From a juridical standpoint, the system lacks both preventive and repressive mechanisms. Preventive measures, such as clear protocols for data protection and oversight, are not explicitly codified, while repressive measures, such as legal remedies or sanctions in the event of system errors or data breaches, are largely absent. This deficiency exposes both travelers and the government to potential risks.

Additionally, the lack of explicit legislation has implications for accountability. In the event of technical failures or misuse of biometric data, the current regulatory framework does not provide clear guidance on liability. Immigration officers may be unclear about the legal consequences of errors, and travelers may not have sufficient avenues for legal recourse. This situation underscores a broader gap between technological innovation and legal adaptation: while the autogate system modernizes immigration processes, the legal framework has not evolved at the same pace to ensure robust protection and accountability. The absence of specific laws also affects public perception. Trust in the system is influenced not only by operational reliability but also by legal assurance that personal data is protected and that any disputes can be addressed through established mechanisms. Consequently, the juridical effectiveness of the autogate system is only partial: it functions efficiently in practical terms but fails to fully guarantee legal certainty, accountability, and comprehensive protection for all users. Strengthening legal frameworks and regulatory clarity is therefore crucial to aligning technological advancement with legal safeguards. [12]

4.3 User Perceptions and Practical Impact

Empirical evidence suggests that foreign travelers generally perceive the autogate system positively, appreciating the speed, convenience, and reduced waiting time it provides. The system allows passengers to bypass long queues, which is particularly beneficial during peak travel periods, and offers a sense of autonomy as travelers

Nanda Horas Pranata et al

manage their own clearance process. This positive reception demonstrates that the technological innovation meets an important practical need in immigration management, aligning with global trends in automated border control. However, user satisfaction is not uniform. Technical malfunctions, such as biometric mismatches or system downtime, often generate frustration and delays, undermining the perceived efficiency of the system. Passengers encountering errors may need to revert to manual verification, which diminishes the advantages of automation and increases stress for both travelers and staff. In addition, many travelers express concerns regarding the lack of transparency about the use and storage of their biometric data. Questions such as how long data is retained, who has access, and what measures exist to prevent misuse remain largely unanswered, leading to partial trust in the system. The practical impact of the autogate system also extends to institutional workflow. Immigration officers report that the system reduces workload for routine cases, allowing more focused attention on high-risk or non-eligible travelers. Nonetheless, the dual-track process, where some passengers use automated gates and others require manual checks, introduces operational complexity. Officers must switch between automated oversight and manual procedures, which can create inconsistencies and slow down service in some cases. This indicates that while the system achieves operational efficiency in many situations, its practical benefits are contingent upon both reliable technology and well-trained staff.

From a juridical perspective, user perceptions highlight the partial effectiveness of the system. While travelers experience tangible improvements in speed and convenience, the absence of clear legal protections for biometric data limits public confidence. The system succeeds technologically but does not fully meet legal and ethical standards expected by users, particularly regarding data privacy, accountability, and redress mechanisms. This gap between user expectations and legal safeguards illustrates the broader challenge of integrating technological solutions into public services without parallel development in regulatory frameworks. Overall, user perceptions indicate that the autogate system enhances efficiency and passenger experience but simultaneously exposes weaknesses in legal clarity, technical reliability, and institutional readiness. Addressing these concerns is essential to consolidate trust, ensure consistent operational performance, and strengthen the system's juridical effectiveness. Without addressing legal and procedural transparency, even technologically successful innovations may fail to achieve full public acceptance.[13]

4.4 Technical and Institutional Challenges

Despite its advantages, the autogate system faces several technical and institutional challenges that limit its overall effectiveness. Technically, biometric mismatches, software errors, and periodic downtime compromise the intended efficiency of automated clearance. When passengers encounter recognition errors or system malfunctions, they are redirected to manual verification counters, leading to delays and undermining the purpose of automation. The system's dependence on consistent and accurate biometric scanning highlights the need for high-quality infrastructure and maintenance routines, which are sometimes insufficient due to budgetary and operational constraints. Institutional challenges further complicate implementation. Immigration officers exhibit varying levels of familiarity and competence in handling the autogate system, affecting consistency in passenger processing. While some officers are well-trained, others lack experience, which can lead to inconsistent application of procedures and delays. Furthermore, limited maintenance budgets and insufficient technical support exacerbate the impact of system failures, as repairs may not be timely, and preventive maintenance is not always systematically conducted. These factors indicate that institutional capacity has not fully aligned with the demands of technological innovation, limiting the system's operational reliability.

The challenges also have juridical implications. Frequent technical issues and inconsistent application of automated procedures compromise preventive legal protection, as the system cannot guarantee seamless service for all users. Data integrity and security may be jeopardized when malfunctions occur, raising concerns regarding the protection of sensitive biometric information. Without clear institutional protocols for addressing errors, including reporting mechanisms and remedies, the system's juridical effectiveness is compromised, exposing both travelers and the government to potential legal risks. Moreover, coordination between technical teams and operational staff is crucial but often insufficient. Officers may lack timely guidance when encountering technical problems, while technical teams may be constrained by limited budgets or organizational hierarchy. Such gaps hinder swift problem-solving and reduce system reliability. Addressing these technical and institutional challenges requires not only upgrading infrastructure but also implementing comprehensive training, clear procedural protocols, and adequate resource allocation.. [14]

Nanda Horas Pranata et al

5. Comparison

When analyzing the effectiveness of the autogate system in Batam, it is important to compare it with similar implementations in neighboring countries such as Singapore and Malaysia. These comparisons reveal both the strengths and weaknesses of Indonesia's approach while highlighting lessons that can be adopted for future reforms. In Singapore, the Immigration and Checkpoints Authority (ICA) has developed one of the most advanced border management systems in the region. Autogates in Singapore integrate biometric verification with e-passports and national databases, allowing travelers to pass through immigration checkpoints within seconds. The system is inclusive, covering almost all categories of travelers, including citizens, permanent residents, and frequent foreign visitors. The legal framework in Singapore also ensures strong protection of biometric data through the Personal Data Protection Act (PDPA), which provides legal certainty, transparency, and accountability. This combination of technology and regulation demonstrates a high level of juridical effectiveness, where efficiency is matched by legal safeguards and public trust. Malaysia presents another useful comparison. The country has long implemented autogates at airports and land borders, particularly to facilitate the movement of ASEAN citizens and Malaysian nationals. The system integrates biometric recognition with national identification cards, ensuring both speed and accuracy. Unlike Singapore, Malaysia still faces occasional technical disruptions, which sometimes force travelers to revert to manual clearance. Nevertheless, Malaysia has introduced clear immigration regulations governing autogates, offering stronger legal certainty compared to Indonesia. These regulations explicitly recognize the system's role in border management, ensuring that immigration officers and travelers alike understand the procedures and safeguards in place.

Compared to these two countries, Indonesia's autogate system in Batam appears less advanced both in scope and in legal certainty. While it has succeeded in reducing waiting times for eligible travelers, its coverage remains limited, technical issues persist, and statutory regulations are absent. The reliance on ministerial decrees without specific legislative provisions weakens the juridical foundation of the system. Moreover, Indonesia lacks comprehensive data protection laws to regulate the use of biometric information, raising concerns about privacy and misuse. This creates a gap between technological innovation and legal adaptation, reducing the system's overall effectiveness. The comparison shows that Indonesia can draw important lessons from its neighbors. Singapore demonstrates the importance of a strong legal framework for biometric data protection, while Malaysia illustrates how explicit immigration regulations can ensure legal certainty despite technical challenges. For Batam, adopting these lessons means strengthening the legal basis of the autogate system, expanding its coverage, and ensuring accountability for data usage. By bridging the gap between regulation and practice, Indonesia can ensure that technological innovation in immigration services is not only efficient but also legally sound and sustainable.[15]

6. Conclusions and Suggestion

Based on the discussion in the previous chapter, the following conclusions can be drawn:

a. Strong Legal Basis but Limited Implementation

The Online Stay Permit System in Batam City is supported by a comprehensive legal framework, including Law No. 6 of 2011 on Immigration, Presidential Regulation No. 95 of 2018 on the Electronic-Based Government System (SPBE), and ministerial regulations. These legal instruments aim to ensure efficiency, transparency, and accountability in immigration services in line with good governance principles. However, despite this strong normative foundation, practical implementation is still limited by technical and operational challenges.

b. Improvements and Remaining Technical Issues

The system successfully reduces face-to-face interactions and provides an online tracking feature for applicants, minimizing opportunities for corruption. Nonetheless, persistent technical issues—such as slow system performance, frequent downtime, and unstable connectivity—undermine its intended purpose. These issues lead to delays in application processing and create user dissatisfaction

c. Human Resource Capacity Gaps

Immigration officers' technical capabilities are insufficient to manage the system effectively. Training provided to staff is basic and does not cover complex troubleshooting, resulting in inconsistencies in service delivery. The absence of standardized procedures for handling system failures exacerbates these weaknesses

d. Lack of Legal Certainty for Applicants

Although the system offers real-time tracking, delays caused by manual verification and technical problems create uncertainty for foreign nationals. This situation exposes applicants to the risk of overstaying permits, which carries legal sanctions under Indonesian immigration law.

Nanda Horas Pranata et al

e. Low Digital Literacy Among Users

Many foreign nationals face difficulties using the system due to low digital literacy, language barriers, and insufficient guidance. The absence of multilingual support and user-friendly tutorials leads to frequent application errors and reliance on intermediaries, which can increase costs and risks of fraud

From these conclusions, the author can offer several recommendations, namely:

a. Improve Technological Infrastructure

To ensure stable and efficient system performance, the government should prioritize upgrading server capacity, strengthening cybersecurity measures, and expanding reliable internet connectivity, especially in immigration-heavy regions like Batam

b. Strengthen Human Resource Capacity

Comprehensive technical training for immigration officers should be conducted, focusing on troubleshooting and managing digital platforms. Standard operating procedures must also be developed to guide staff in handling technical failures and user complaints consistently

c. Enhance Public Education and Multilingual Support

Public education initiatives are essential to improve user experience. These should include step-by-step guides, video tutorials, and multilingual materials to help applicants navigate the system without relying on intermediaries. Such resources will reduce errors and promote transparency

d. Integrate Proactive Features

The system should adopt features such as automated reminders for expiring permits and real-time assistance through integrated help-desk services. The success of SITITIK in Medan proves that proactive notification systems can effectively prevent overstays and enhance compliance with immigration regulations

e. Establish a Formal Grievance Mechanism

A clear and accessible complaint handling system should be introduced to ensure legal certainty and user confidence. Applicants must have a formal avenue to report delays or errors and receive timely responses, following international best practices in countries like Singapore and the United Kingdom

f. Implement Continuous Monitoring and Evaluation

Regular assessments of the system's performance should be institutionalized to identify areas for improvement. Collaboration between the Directorate General of Immigration, local offices, and stakeholders is critical to maintaining alignment with technological advances and legal principles

Author Contributions: A short paragraph specifying their individual contributions must be provided for research articles with several authors (**mandatory for more than 1 author**). The following statements should be used "Conceptualization: X.X. and Y.Y.; Methodology: X.X.; Software: X.X.; Validation: X.X., Y.Y. and Z.Z.; Formal analysis: X.X.; Investigation: X.X.; Resources: X.X.; Data curation: X.X.; Writing—original draft preparation: X.X.; Writing—review and editing: X.X.; Visualization: X.X.; Supervision: X.X.; Project administration: X.X.; Funding acquisition: Y.Y."

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Data Availability Statement: We encourage all authors of articles published in FAITH journals to share their research data. This section provides details regarding where data supporting reported results can be found, including links to publicly archived datasets analyzed or generated during the study. Where no new data were created or data unavailable due to privacy or ethical restrictions, a statement is still required.

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Nanda Horas Pranata et al

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