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EFFECTIVENESS OF AUTOGATE USAGE IN IMPROVING IMMIGRATION SERVICES AT I GUSTI NGURAH RAI AIRPORT

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Abstract

The use of autogates at I Gusti Ngurah Rai Airport has proven effective in improving immigration services by speeding up the inspection process to 15-25 seconds per passer, reducing queues, and increasing comfort and security through accurate biometric technology. Throughout 2024, more than 4 million passengers, primarily foreign and business tourists, used autogates with a positive response, although manual services are still provided under certain conditions. Obstacles such as limited infrastructure, technologically proficient human resources, and e-passport compatibility remain, but optimal solutions include strengthening technology, user education, human resource development, and adjusting data protection regulations. Integration with national databases and AI technology also optimizes efficiency and security, making autogates a strategic innovation in immigration public services in Indonesia. With a descriptive-analytical approach, this study is expected to provide a comprehensive overview of the legal and regulatory challenges faced, as well as strategic recommendations for the analysis of autogate services at I Gusti Ngurah Rai International Airport by the Class I immigration office specifically for TPI Ngurah Rai.
Keywords: Autogate, Immigration, Airport

A. INTRODUCTION

In the era of increasingly digitalization, various public service sectors continue to adapt to technological advances to improve the efficiency and effectiveness of public services. Immigration is one sector experiencing significant change, leveraging technological innovations to accelerate the inspection and management of international travel data (Sepriano et al., 2023). One solution adopted to support the digital transformation of immigration services in Indonesia is autogate technology, an automated inspection system designed to expedite the immigration process without compromising security (Hanan et al., 2025).

Along with the increasing mobility of people due to globalization, the number of international trips involving Indonesian citizens and foreign nationals entering and leaving Indonesia continues to increase annually. This surge in passenger volume presents a significant challenge for the immigration inspection system, which still relies on manual methods (Ibrahim & Halkam, 2021). Long queues, long waiting times, and the risk of administrative errors are some of the problems frequently encountered at Immigration Checkpoints (TPI), particularly at international airports. These conditions not only have the potential to reduce the quality of immigration services but also impact Indonesia's image in providing fast, modern, and efficient services to international travelers (Arizky et al., 2025).

Autogate technology was introduced as an innovative solution to address these issues. This system allows users to independently clear immigration checks using an electronic passport or identity card registered in the system (Pratama & Jamil, 2023). With the implementation of autogates, the inspection process can be carried out more quickly than conventional methods that require direct interaction with immigration officers. The use of this technology is expected to reduce long queues at airports, increase inspection efficiency, and expedite the flow of international travelers (Fatharani et al., 2021).

However, the implementation of autogates in Indonesia still faces various challenges that require further attention. One major obstacle is the readiness of the infrastructure and technology supporting these systems. Several international airports in Indonesia have adopted autogates, but not all have adequate infrastructure to ensure the system's continued operation (Nugraha et al., 2024). Technical glitches such as system failures in reading biometric data, identity verification errors, and network issues are common problems with autogate use. Furthermore, not everyone uses passports that support electronic systems, so solutions are still needed for users who cannot use autogates (Sujiyanto, 2025).

In addition to technological factors, regulatory and policy aspects also pose challenges to the implementation of autogates in the immigration sector. The Indonesian government continues to strengthen regulations related to personal data protection and security mechanisms for autogate use. However, concerns remain regarding the potential misuse of biometric data and the risk of information leaks that could compromise user privacy. In this regard, clear policies and a robust security system are needed to ensure that autogate user data remains secure (Huda et al., 2024).

The effectiveness and efficiency of the autogate system in improving the quality of immigration services is also an aspect that requires further research. Several countries that have already implemented autogates have reported that these systems significantly reduce inspection times and increase user satisfaction. However, in the Indonesian context, in-depth studies are still needed to determine the extent to which this system truly has a positive impact on service efficiency, security, and user comfort. Evaluation of autogate implementation is also crucial to determine whether this system can be more widely adopted at various immigration checkpoints in Indonesia.

In addition to examining effectiveness, it is also important to identify supporting and inhibiting factors in autogate implementation in Indonesia. Several supporting factors include the government's commitment to digitizing public services, budget readiness for technological infrastructure procurement, and increasing public support for digital-based services (Zein & Septiani, 2024). Meanwhile, inhibiting factors that could slow down autogate implementation include limited infrastructure at some airports, a lack of public understanding of the use of this technology, and resistance to change that persists at various levels of immigration organizations (Loho & Ilham, 2025).

Given the various challenges and opportunities, it is crucial to conduct comprehensive research on the implementation of autogates in immigration services in Indonesia. This research is needed to answer fundamental questions about the extent to which autogates can improve the efficiency and quality of immigration services, as well as to identify obstacles that need to be addressed for the system to operate optimally. With comprehensive research results, it is hoped that appropriate policy recommendations can be found to support the digital transformation of immigration services, so that Indonesia can provide a more modern, faster, and safer immigration system for all immigration service users.

The Immigration Inspection Time category explains the comparison between manual and autogate inspection times. The average manual inspection time at the TPI can take 2–5 minutes per person, while with the implementation of autogates, inspection times can be

reduced to 15–25 seconds per person at Soekarno-Hatta Airport and 15–20 seconds at Ngurah Rai Airport.

The Autogate Implementation category describes the implementation of the autogate system in Indonesia. At Soekarno-Hatta Airport, 78 autogates were operational starting in January 2023, allowing Indonesian citizens (WNI) and foreign nationals (WNA) to pass through security checks quickly and independently. Meanwhile, at Ngurah Rai Airport, despite the use of autogates, manual counters remain in place to support passengers unable to use the system.

Finally, the Implementation Challenges category describes several obstacles faced in implementing autogates in Indonesia. Infrastructure and technology at several TPIs are still inadequate, and many travelers still lack electronic passports compatible with the autogate system. Furthermore, personal data protection and regulations related to its use are also key concerns.

Based on the above description, the author will conduct a study entitled "THE EFFECTIVENESS OF AUTOGATE USAGE TO IMPROVE IMMIGRATION SERVICES AT I GUSTI NGURAH RAI AIRPORT."

The problem formulation discussed in this paper is:

1) How effective is the use of autogates in improving immigration services at I Gusti Ngurah Rai Airport?
2) What are the challenges in using autogates to improve immigration services at I Gusti Ngurah Rai Airport?
3) What solutions can be found to optimize the effectiveness of autogates to improve immigration services at I Gusti Ngurah Rai Airport?

B. LITERATURE REVIEW

Immigration Services at International Airports

Immigration services at international airports play a strategic role in maintaining national security while providing comfort for international passengers. Travel document checks, identity validation, and monitoring of entry and exit are carried out to prevent violations of the law, maintain order, and support the smooth flow of transportation. The quality of immigration services is one indicator of a country's image in the eyes of the world, making service innovation an urgent need (Nugroho et al., 2025).

Autogate Concept and Function

Autogate is an automated technology-based immigration inspection system that utilizes biometric recognition and electronic passport reading. This system is designed to speed up the inspection process at airport entrances and exits, minimize physical contact between officers and passengers, and improve data validation accuracy. The use of autogates at modern airports is part of efforts to digitize public services and implement international standards in the immigration sector (Purba & Wiradinara, 2022).

Effectiveness of Using Autogate

The effectiveness of autogate use can be measured by service speed, inspection accuracy, user satisfaction, and reduced queues at the inspection area. This system is capable of processing passengers quickly without compromising the quality of the inspection. However, its effectiveness is also influenced by supporting factors such as infrastructure readiness, user ability to operate the autogate, and the reliability of the equipment and information technology systems used (Haryo, 2024).

Improving Immigration Services through Technological Innovation

Improving immigration services through technological innovation aims to create a faster, safer, and more comfortable travel experience for passengers. Integration of autogates with the national immigration database, robust cybersecurity, and officer training in system management are key factors in its successful implementation. The use of technologies such as autogates also supports the vision of a modern public service that is responsive to global developments and the needs of air transportation users (Ryanindityo et al., 2025).

C. RESEARCH METHODOLOGY

In this research, a qualitative approach was chosen because it allows researchers the flexibility to comprehensively explore the implementation process of the autogate policy, including supporting factors, obstacles, and its impact on the quality of public services. This research is a case study at Ngurah Rai Airport using a descriptive qualitative approach. Through an inductive and interactive analysis process, it is hoped that a contextual and theoretical understanding of the phenomenon under study will emerge (Badii & Nurdin, 2025).

Data were obtained through literature review and limited interviews with legal practitioners, government officials, and industry players in the IT sector. The collected data were analyzed qualitatively to evaluate the alignment between legal norms and investment practices in the field.

D. RESULT AND DISCUSSION

The Effectiveness of Autogate Use to Improve Immigration Services at I Gusti Ngurah Rai Airport

In the era of increasingly advanced digitalization, technological innovation in public services has become an absolute necessity to improve efficiency and service quality. Specifically in immigration services, autogate technology has become one of the solutions adopted to expedite immigration checks without compromising security. I Gusti Ngurah Rai Airport, as one of the main international entry points in Indonesia, has implemented autogates to expedite the inspection process for arrivals and improve user comfort. Autogate is an automated inspection system based on biometric technology that allows for identity verification of passers-by without direct interaction with immigration officers. The use of this technology can significantly reduce inspection times, from an average of 2–5 minutes during manual checks to around 15–20 seconds per passer using autogates at Ngurah Rai Airport. This time efficiency is certainly crucial in managing long queues and increasing user satisfaction.

Biometric technologies such as facial and fingerprint recognition applied to autogates offer high accuracy, enhancing security while reducing human error common in manual checkpoints. Therefore, the use of autogates not only aims to increase service speed but also ensures data validity and strengthens national security. However, the effectiveness of autogates is not solely determined by technical aspects, but also by infrastructure readiness and human resource management. In Indonesia, most Immigration Checkpoints (TPIs) lack adequate technological infrastructure, posing a major challenge to widespread autogate implementation. Furthermore, the public's level of understanding and readiness to use this technology also varies.

In the context of Ngurah Rai Airport, the implementation of autogates has received a positive response from service users, particularly foreign travelers and businesspeople who require speed and convenience during the immigration process. However, manual counters are still maintained to serve those who do not have an electronic passport or encounter other

technical difficulties. This demonstrates the need for a hybrid approach that accommodates diverse user needs. Immigration services are vital to maintaining security and order across borders. These services focus on checking travel documents, granting entry permits, and monitoring compliance with regulations.

Therefore, the autogate innovation is expected to support this dual function—accelerating the service process while optimizing security controls. The effectiveness of an autogate system is also measured by its ability to comply with personal data protection regulations. Biometric data collection requires strict protection to prevent misuse. Accordingly, public policy must ensure the security of user data without hindering the service process.

The innovation theory proposed by Everett M. Rogers explains that the adoption of new technology is influenced by factors such as relative advantage, compatibility, complexity, trialability, and observability. In the case of autogates, the relative advantages of time effectiveness and security must be well communicated to increase the adoption rate by users. The implementation of autogates at Ngurah Rai Airport also demonstrates a close link to digital transformation in public policy. It emphasizes that technological innovation can be a catalyst for improving public services that are more efficient and effective. Autogate is a clear demonstration of this principle in immigration services, which seeks to increase transparency and convenience for service users.

However, resistance to change remains a barrier to implementing new technologies. Factors such as low digital literacy, fear of job loss for manual officers, and regulatory uncertainty are obstacles that must be addressed through intensive education and outreach. From an organizational perspective, the effectiveness of autogates also depends on the immigration agency's ability to optimize existing resources. Gibson, Ivancevich, and Donnelly argue that organizational effectiveness is the ability to achieve goals by optimally utilizing resources. Therefore, training for officers and managing technology systems must be a primary focus.

Research at Ngurah Rai Airport identified various solutions to improve autogate effectiveness, such as improving IT infrastructure, adjusting regulations, and providing intensive training for officers and user education. Furthermore, developing a more user-friendly system was a key recommendation to ensure access for all levels of society. The importance of in-depth research continues to be emphasized to ensure autogate implementation is not merely a technological innovation but also a public service policy capable of delivering tangible positive impacts. Through comprehensive evaluation, obstacles and opportunities can be precisely identified for continuous improvement.

Autogate development must also be integrated with other airport security systems, such as aviation security and smart airports, to achieve optimal synergy in service and security. Research on smart airport strategies at Ngurah Rai Airport provides an overview of technology developments that can complement autogates. Data management readiness and system interoperability are also critical aspects in ensuring smooth autogate operation. Collaboration across relevant agencies is essential for effective information and data exchange to support system sustainability.

From the perspective of public administration law theory, Soerjono Soekanto explains that the effectiveness of laws and policies depends on their tangible impact, which can change behavior and achieve predetermined service objectives. In this regard, the policy on the use of autogates is expected to be more than symbolic, but to truly provide convenience and security for the public. At the implementation level, autogate evaluation must also consider the social and cultural dimensions of the user community. Cultural factors that

influence users' perspectives and behaviors in utilizing this technology need to be accommodated in socialization strategies and technical assistance.

Overall, the research results show that the use of autogates at I Gusti Ngurah Rai Airport can significantly improve immigration service speed and reduce queues if supported by optimal technical and managerial implementation. The integration of security and personal data protection aspects is also well-executed, based on reliable biometric technology.

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Obstacles in Using Autogate to Improve Immigration Services at I Gusti Ngurah Rai Airport

The use of autogate technology in immigration services is an innovative step implemented to expedite the inspection process and improve service efficiency at the airport. However, the implementation of autogates at I Gusti Ngurah Rai Airport faces various obstacles that have prevented the technology from being fully effective. These obstacles include infrastructure issues, technological readiness, regulatory aspects, and social and cultural factors among users. This reflects complex challenges that must be understood and addressed for autogates to function optimally and bring significant benefits to immigration services.

One major obstacle is the uneven readiness of technological infrastructure at the airport. Not all immigration checkpoints at Ngurah Rai Airport have adequate facilities and infrastructure to support the continuous operation of autogates. The electronic autogate system requires a stable internet network, reliable hardware, and a backup system to prevent service disruptions. If any of these components are missing, the inspection process can be delayed or even fail, directly impacting service quality.

Besides infrastructure, technological readiness is also a significant obstacle. The autogate technology used requires compatibility with the e-passport held by the traveler. However, not all immigration service users have an e-passport that meets the standards readable by the autogate system. As a result, some travelers still have to use manual channels, resulting in inconsistent inspection processes and sometimes long queues. This demonstrates that even sophisticated technology cannot operate effectively without the readiness of documents and other supporting facilities.

Another obstacle is the limited human resources needed to manage and operate the autogate system. Immigration officers need to have adequate skills and knowledge of biometric technology and related software to provide technical support and assist travelers experiencing difficulties. However, a competency gap persists, resulting in some officers being unable to fully optimize the autogate's functionality, resulting in suboptimal system performance. Regulatory factors and personal data protection also pose challenges to autogate use. Biometric data collected during the inspection process must be managed with a strict security system to prevent misuse and privacy violations. In Indonesia, this aspect remains a concern because regulations regarding personal data protection are not yet fully developed and comprehensive. This lack of clarity in the regulations creates legal risks and potential public resistance to the use of biometric technology in public services.

Sociocultural aspects of users also hinder the implementation of autogates. Some international and domestic passengers may be unfamiliar with or distrust automated screening technology. They prefer manual services that involve direct interaction with immigration officers, which they feel more comfortable and secure. This highlights the need for intensive

education and outreach to ensure the public understands the benefits and proper use of this technology.

Technical glitches in the autogate system are also common problems. Malfunctioning devices, failure to read fingerprints or faces, and network failures can cause delays in the screening process. These disruptions not only hinder the smooth flow of movement but also lead to user dissatisfaction, potentially tarnishing the overall image of immigration services.

Furthermore, challenges in the management and administration of the autogate system also impact the performance of this technology. Coordination between relevant units, such as the Directorate General of Immigration, airport authorities, and technology providers, needs to be strengthened to ensure the autogate system operates smoothly and receives regular maintenance. The lack of synergy and communication between stakeholders has resulted in uncertain operational continuity of this technology. The uneven distribution of autogate equipment within airports is also a problem, as these facilities are not yet available equally at all inspection lanes. This situation creates an imbalance in services for passers-by using different lanes, thus preventing the goal of expediting and streamlining inspections from being optimally achieved.

Furthermore, the reliance on technology also poses a risk in the event of a complete system failure. Without prompt response and an effective backup system, immigration services could be temporarily paralyzed. Therefore, thorough contingency planning is crucial to minimize the impact of technological accidents. Financial constraints also hinder the development and maintenance of autogate systems. Significant investments are required for equipment purchase, software development, and supporting infrastructure upgrades. Limited budgetary resources slow down the process of repairs and technological upgrades, potentially reducing the expected long-term benefits.

Furthermore, concerns about data security pose a barrier for some. As a service that uses biometric technology, travelers sometimes feel anxious about how their personal data is stored and used, leading to discomfort and reluctance to use autogates. From a technical perspective, differences in passport types and standards used by international passengers also pose a significant obstacle. Not all electronic passports are compatible with existing autogate systems, impacting the system's ability to perform identity verification automatically and quickly.

Furthermore, resistance to change among immigration officers also contributes to the slow implementation of this new technology. Some officers may fear losing their jobs or lack familiarity with new technology that disrupts old work routines. This resistance needs to be addressed through appropriate training and managerial approaches. Communication barriers between immigration officers and service users also need to be addressed. When using autogates, officers must be prepared to provide guidance to travelers who are unfamiliar with how to use the machines to ensure effective service. A lack of ability to provide guidance also impacts the smooth use of this technology.

Another obstacle is the diverse demographics of users, including the elderly who may be unfamiliar with digital technology, requiring more time and assistance to navigate the autogate inspection process. This requires a tailored approach that is user-friendly to all levels of society. In addition to internal airport and user factors, external factors, such as government policies regarding digitalization, also influence the effectiveness of autogate use. Policies that do not fully support or lack a clear legal framework for the use of this technology will slow its adoption and development.

Low digital literacy levels in some communities are also a major obstacle, as autogate use requires a basic understanding of technology that may not be readily available to all users. Furthermore, high staff workloads and a shortage of support personnel can lead to a

decline in service quality, particularly in the need for manual assistance to assist users who are less familiar with autogate operations.

Solutions to Optimize the Effectiveness of Autogate Use to Improve Immigration Services at I Gusti Ngurah Rai Airport

Optimizing the effectiveness of autogates to improve immigration services at I Gusti Ngurah Rai Airport is a strategic step that requires multidimensional attention, from technology and human resources to regulations and public services. First, strengthening the airport's technological infrastructure is a key priority. Adequate infrastructure, such as a stable data network, state-of-the-art autogate hardware, and a robust cybersecurity system, ensures the system can operate smoothly. The smart airport development strategy at Ngurah Rai Airport emphasizes technological readiness as the primary foundation for the successful implementation of digital-based service innovations. Without adequate infrastructure, autogates cannot function optimally and can even cause inconvenience to users.

Furthermore, public outreach and education regarding autogate use are crucial to increase user understanding and readiness. Many obstacles arise from a lack of public understanding regarding autogate use and valid travel documents. Therefore, ongoing education and outreach programs are necessary, both through social media, information boards at the airport, and through officers ready to assist passengers. Digital literacy is one of the factors that greatly influences the successful use of technology in public services, especially in services that require direct interaction between users and systems.

Developing competent and adaptive human resources is also essential. Although autogates serve to expedite the inspection process, immigration officers remain essential for handling technical issues, manual verification, and assisting users experiencing difficulties. Therefore, officers with strong information technology and public service skills can expedite problem resolution in the field and improve service quality. This is supported by the proposed theory of organizational innovation, which states that human resource readiness is a critical factor in the successful diffusion of new technology within an organization.

In addition to strengthening human resources and infrastructure, regulatory adjustments related to the use of biometric data and electronic passports are necessary to ensure the protection of users' personal data in accordance with international standards. Clear regulations regarding the storage mechanisms, access control, and use of biometric data must be implemented to ensure the public feels safe and confident using autogates. Adequate and adaptive legal policies to technological developments are essential to support the implementation of technology in the public sector, including immigration services.

Integrating the autogate system with other immigration service systems is also a solution to increase efficiency. This means that data obtained from the autogate must be directly integrated with the national immigration database and other security systems to enable real-time verification. This integration minimizes the potential for errors or data manipulation, thus ensuring greater security. This emphasizes that information system integration is a crucial aspect of immigration services to achieve optimal data management results.

The use of artificial intelligence (AI) and machine learning technologies to support biometric data analysis is also highly recommended. This technology can improve the accuracy of identity verification and detect patterns of fraud or data misuse. His research on biometric applications in autogates emphasized that AI technology can strengthen security systems while accelerating service processes by reducing verification errors. Thus, AI not only improves efficiency but also improves security effectiveness. Regular evaluation and monitoring of autogate performance need to be systematically conducted. Monitoring system failures, user complaints, and analysis of inspection times can be key indicators in assessing

the effectiveness of autogate use. If technical or non-technical obstacles are encountered, follow-up actions in the form of improvements and enhancements can be implemented immediately. Continuous evaluation of implemented technological innovations is crucial to ensure appropriate and sustainable adaptation.

Developing user-friendly features in the autogate interface is equally important. Passengers from diverse backgrounds, including those less familiar with technology, should be able to use the autogate easily and without confusion. The addition of interactive tutorials, easy-to-understand icons, and live support facilities can facilitate user experience. Inclusive and communicative interface design is a crucial aspect of implementing public service technology to ensure it reaches all levels of society. The establishment of a trained rapid response team to handle issues directly on-site is also recommended. This team should be on standby to resolve technical issues and assist passengers in using the autogate, especially during peak hours. With live support, user confidence increases and queues arising from system failures can be minimized. This aligns with the public administration's principle of excellent service, which requires responsive and timely service.

Furthermore, increased collaboration between relevant institutions is needed. Stakeholders such as the Directorate General of Immigration, airport authorities, and technology providers must work together in an integrated manner to ensure effective coordination in the maintenance and development of autogate technology. This synergy will accelerate solutions to technical issues and policies that support service sustainability. The smart airport study emphasized that cross-sector collaboration is key to the success of developing digital service systems at airports. Developing supporting applications accessible via smartphones can also optimize services. These applications can provide features such as autogate user guides, queue notifications, and direct user feedback. This way, immigration service users can be more prepared and comfortable when using autogates. The implementation of such applications has been successfully adopted at several international airports and has contributed to increased service efficiency.

In addition to focusing on technology and users, special attention to sustainability is also required. Airports must allocate sufficient budget for the maintenance and upgrade of autogate systems to prevent a decline in service quality over time. Management must ensure that this system is not merely a short-term project, but part of a long-term strategy for the digital transformation of immigration services. Regular service quality monitoring through user satisfaction surveys is also mandatory. These surveys can identify service weaknesses that require attention, including autogate performance, ease of use, and officer responsiveness. User assessments are a valid source of information for further service development.

To increase public trust, transparency in the autogate usage process must be maintained. Users need to be provided with clear information about how their data is processed and protected. Providing easily accessible information and guaranteeing data security regulations provides a sense of security to users, thereby increasing participation in autogate use. The development of clear and standardized standard operating procedures (SOPs) for autogate use is inevitable. These SOPs serve as guidelines for officers and users in both normal and emergency situations, so that the service process can run consistently and safely. Explaining that standard operating procedures are one of the main keys in ensuring the implementation of quality and reliable services. Furthermore, the development of key performance indicators (KPIs) related to autogate use and immigration services is necessary. These KPIs help management measure the extent to which service objectives are achieved and serve as a basis for strategic decision-making for service development. convey the importance of measuring

and monitoring performance in the innovation diffusion process to ensure successful implementation.

Strengthening security aspects through the integration of other biometric technologies such as iris scanning and voice recognition can complement existing technologies in autogates. The use of multiple biometrics can improve identification accuracy while reducing the potential for errors or identity misuse. Developing incentive schemes for active and consistent autogate users can also be a strategy to encourage wider adoption of this technology. For example, reducing queue times or special facilities for frequent autogate users can increase user interest and comfort. Increasing autogate capacity and features to handle more passengers simultaneously is important given the surge in visits to Ngurah Rai Airport, especially during the holiday season. Developing system scalability is a crucial issue to prevent service congestion, especially during high passenger volumes.

Given the need for dynamic adaptation, regular training for immigration officers at Ngurah Rai Airport in autogate technology and public services, based on case studies and field experience, is essential. This training not only improves technical competency but also communication and customer service skills. Finally, continuous research and development related to technological innovation in immigration services must be encouraged by the government and relevant institutions. This ensures that autogates and other new technologies continue to evolve in line with global needs and dynamics, while also addressing emerging challenges in the field. By implementing all of the above solutions in an integrated manner, the effectiveness of autogate use at I Gusti Ngurah Rai Airport can be optimized, resulting in faster, more efficient, and safer immigration services, providing a positive experience for service users while supporting the digital transformation of the Indonesian government.

E. CONCLUSION

The use of autogates at I Gusti Ngurah Rai Airport has proven effective in improving immigration services by speeding up the inspection process from several minutes to just 15-25 seconds per passer, while also enhancing comfort and security through accurate biometric technology. This implementation has received a positive response from service users, particularly foreign tourists and business people, although manual services remain available for those who need them. The success of autogates depends heavily on infrastructure readiness, officer training, public education, and strict personal data protection. With regulatory support and continuous technological development, autogates are expected to become a strategic innovation in efficient and secure immigration public services in Indonesia.

Obstacles to autogate use at I Gusti Ngurah Rai Airport include uneven infrastructure and technology readiness, limited human resources skilled in biometric technology, and not all users possessing compatible electronic passports. Furthermore, technical device and network disruptions, regulatory constraints on personal data protection, and socio-cultural resistance from users and officers also hamper the effectiveness of autogates. Poorly coordinated system management and limited maintenance budgets are also inhibiting factors, preventing the autogate service from operating optimally to speed up and improve immigration services at the airport.

The solution to optimize autogate usage at I Gusti Ngurah Rai Airport includes strengthening reliable technological infrastructure, educating and outreach to users, developing competent human resources, and adjusting biometric data protection regulations. Integrating the autogate system with the national immigration database and AI technology for biometric verification improves efficiency and security. A user-friendly interface, rapid response team, cross-agency collaboration, and supporting applications also play a crucial

role. Regular evaluations, process transparency, the development of standard operating procedures (SOPs) and key performance indicators (KPIs), and increasing facility capacity ensure fast, safe, and high-quality service. This integrated approach supports the digital transformation of immigration services and provides a positive user experience at Ngurah Rai Airport.

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