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# Analysis of the Influence of the Quality of Infrastructure and Human Resources on the Effectiveness of the Building Licensing Process in Denpasar City, Bali Indonesia

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## ABSTRACT

This study aims to analyze the influence of the quality of infrastructure facilities and human resources (HR) competence on the effectiveness of the building licensing process in Denpasar City. The change in regulations from Building Permits (IMB) to Building Approvals (PBG) under the Job Creation Law 2020 provides new challenges in implementing building permits, especially in areas with high levels of development, such as Denpasar City. This study uses a quantitative approach with the Partial Least Square-Structural Equation Modeling (PLS-SEM) method to test the contribution of infrastructure facilities and human resource competence to the effectiveness of licensing. The results show that the quality of infrastructure has a significant influence with an R-square value of 0.45 and a direct influence of 0.60, which means that improving the quality of infrastructure has a positive impact on the smooth licensing process. In addition, HR competence also has a significant influence on the effectiveness of licensing, with an R-square of 0.40 and a direct impact of 0.55. These two variables, when integrated, form an optimal service model that improves licensing efficiency and community satisfaction. These findings show that investment in infrastructure and human resource training focused on enhancing SIMBG's technical and operational skills is an important step to improve the quality of public services. This study provides recommendations to the local government of Denpasar City to increase investment in digital infrastructure, especially in the SIMBG licensing system, and carry out periodic training for employees involved in the licensing process. This recommendation is expected to support the implementation of PBG that is more effective, responsive, and to the needs of the community and permit applicants.

**Keywords:** infrastructure; human resources; licensing effectiveness; SIMBG; Denpasar City.

## INTRODUCTION

Building licensing is an essential component in sustainable regional development governance. Since the enactment of the Job Creation Law [1], the building licensing system has undergone fundamental changes, especially with the introduction of Building Approval (PBG) as a substitute for Building Permits (IMB). This change is not just a change of terminology but also emphasizes the application of building technical standards and stricter adjustments to regional spatial plans. In [2], the government emphasizes that PBG aims to improve buildings' safety, comfort, and sustainability with clearer and stricter technical standards.

The city of Denpasar, the economic and tourism center of Bali, faces a significant challenge in implementing these changes. As one of the cities with a high level of development, Denpasar has complex licensing needs, including licensing commercial, tourism, and residential buildings. The number of licensing applications requires the One-Stop Investment and Integrated Services Office (DPMPTSP) to provide efficient and responsive licensing services. However, the quality of infrastructure facilities and human resources (HR) competence in Denpasar City still need to be improved to achieve these goals. Digital infrastructure such as SIMBG (Building Management Information System) often experiences technical constraints, while HR still needs intensive training to optimize technology in licensing services.

Effective and efficient licensing is a critical factor in supporting sustainable development. The effectiveness of licensing affects the timeliness of development and the satisfaction of the community and business actors who need legal clarity and convenience in the licensing process. With the high demand for development in Denpasar, a slow or ineffective permitting process can cause various negative impacts, including disruption of legal certainty for building owners and delays in development resulting in economic losses.

Furthermore, the quality of public services in building licensing is also one of the indicators of local government performance. The public and entrepreneurs increasingly demand transparent, accountable, and fast services. If this need is not met, then public trust in government institutions can decrease, thereby hampering the investment climate in Denpasar. Therefore, the urgency of this study is to identify the factors that most affect the effectiveness of building permits, especially in terms of the quality of infrastructure and human resource competence, so that it can provide recommendations that can support more effective building licensing.

This research departs from several key questions that will be analyzed in depth:

How does the quality of infrastructure affect the building licensing process in Denpasar? Infrastructure, including information systems, workspaces, and physical equipment, plays a crucial role in the effectiveness of licensing. This study will consider the quality and completeness of existing infrastructure facilities in Denpasar and measure how much it affects the speed and accuracy of the licensing process.

What is the role of human resource competence in supporting licensing efficiency? Competent and trained human resources in licensing and licensing technology are essential to ensure the process runs smoothly. These competencies include an understanding of new regulations, technical skills in using SIMBG, and skills in providing services to the community [3].

This study aims to comprehensively analyze the influence of the quality of infrastructure facilities and human resource competence on the effectiveness of building permits in Denpasar City. Using the Partial Least Square-Structural Equation Modelling (PLS-SEM) method, this study will build a model that integrates the two factors to provide a more comprehensive understanding of the relationship between these variables. The results of this study are expected to be able to provide recommendations to the Denpasar local government to improve the quality of licensing services through improving infrastructure facilities and human resource competence.

Most previous studies discussing building licensing and public services only examined infrastructure facilities or human resource competencies separately. Research linking the two-in-one model is still minimal, especially in the context of building licensing and the implementation of PBG regulations in Denpasar. Therefore, this study will fill the gap by simultaneously modeling the influence of the quality of infrastructure facilities and human resource competence on the effectiveness of licensing.

## Theoretical Studies

### Theory of Public Service Effectiveness

Public service effectiveness is a concept that encompasses various aspects that can be measured through user satisfaction, time accuracy, and quality of services provided by institutions or governments [4], [5]. According to this theory, effective public services not only meet the basic needs of society but also provide a satisfying experience in a transparent, fast, and accessible way. State that the primary goal of public service is to improve the public's welfare by meeting their expectations for service quality. This effectiveness is essential to maintain public trust and encourage public participation in administrative processes [5]. For example, effective building permitting is expected to provide convenience and legal certainty for permit applicants.

### Infrastructure Theory

Grigg (1988) emphasized the importance of infrastructure as a foundation for improving public services. Infrastructure and infrastructure include physical and digital aspects that support administrative processes, such as management information systems, work tools, and physical spaces for services. Grigg stated that the success of public services, including building permits, is highly

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dependent on infrastructure reliability. Adequate infrastructure allows services to run smoothly and reduces potential obstacles in the licensing process. In the context of this research, SIMBG, as a digital management system in Denpasar, is one example of an important infrastructure that supports the effectiveness of the building licensing process.

### Concept and Definition
### Infrastructure

Infrastructure is a physical and digital component that supports the smooth licensing process. According to [6], infrastructure facilities include tools, information technology, and physical facilities that allow the implementation of licensing activities to be more efficient and effective. SIMBG (Building Management Information System) is a digital infrastructure designed to speed up licensing by providing an integrated and easily accessible system for permit applicants and related service officers. With the existence of SIMBG, data verification, checking requirements, and issuing permits can be carried out digitally, which ultimately increases the effectiveness of licensing services [7], [8].

### Human Resources

The quality of human resources (HR) is an essential factor in the success of a licensing service. Explained that quality human resources are characterized by technical competence, coordination skills, and skills in operating digital systems [9], [10]. In the context of licensing, competent human resources are needed to operate SIMBG and to handle permit applications appropriately and quickly. As a workforce interacting directly with the community, HR competencies regarding technical skills and services are crucial to creating responsive and efficient services. In building licensing, the quality of human resources also includes an understanding of the latest regulations, such as PBG, and skills in handling digital applications used in the licensing process.

### Previous Research
### The Relationship of Infrastructure Facilities to Service Effectiveness

Research by [11] shows that adequate infrastructure significantly improves the efficiency of IMB services in Denpasar City. Mandi and colleagues found that the physical facilities and digital systems available at DPMPTSP Denpasar helped speed up the process of document verification and decision-making related to building permits. They concluded that improvements in infrastructure, such as increasing the capacity of information systems and maintaining service facilities, can increase the effectiveness of licensing. The results of this study support the concept that adequate infrastructure is an essential element in the public service process, which directly impacts user satisfaction and the quality of services received by the community.

### The Influence of Human Resources on Licensing Effectiveness

A study by [12] found that HR competence is a critical factor in determining the quality of public licensing services. They show that human resources who have technical skills and understanding of the licensing process, especially with the application of digital technology such as SIMBG, can reduce processing time and increase community satisfaction [13]. In this study, HR competence is measured through the ability of employees to use digital technology, provide responsive services, and follow efficient procedures [14]. Nursafitri and Adnyani concluded that increasing training and developing human resource competencies is necessary to improve the quality of licensing services in the government environment.

## RESEARCH METHODS
### Materials and Research Locations

This research was conducted in the city of Denpasar, Bali, which was chosen because of its high development dynamics and complex building licensing needs. The city is the center of economic and tourism activities in Bali, with many requests for the construction of commercial, residential, and public infrastructure facilities. The focus of this research is on the building licensing process managed by the Denpasar City Investment and One-Stop Integrated Services Office (DPMPTSP), which is responsible for the implementation of permits, including Building Approvals (PBG).

The research population includes two main groups: first, service employees who are directly involved in the licensing and operational process of SIMBG (Building Management Information System), and second, permit applicants, both individuals and company representatives who have applied for building permits in Denpasar. This population selection was carried out to obtain a comprehensive perspective on the effectiveness of licensing, both from the side of service implementers (official employees) and service users (permit applicants). The purposive sampling technique was used to select respondents, taking into account their involvement in the building licensing process in Denpasar City [15].

**Data Collection Methods**

Data collection was carried out using quantitative and qualitative approaches to obtain a more comprehensive understanding of the factors that affect the effectiveness of building permits. Quantitative data was collected through a structured questionnaire that was shared with DPMPTSP employees and permit applicants who had used licensing services. This questionnaire includes questions about the quality of infrastructure, human resource competence, and respondents' perception of the efficiency of the licensing process. The questionnaire used a 5-point Likert scale to measure the level of satisfaction and effectiveness of the licensing process they experienced [16].

Qualitative data was collected through in-depth interviews with DPMPTSP employees and several permit applicants who have experience in the licensing process. This interview aims to explore more information about the obstacles faced, employee perceptions of SIMBG, and the need to improve competencies and infrastructure to support the smooth licensing process. The interview data was analyzed thematically to identify the main patterns or themes related to the factors of the effectiveness of licensing services [8].

**Data Analysis**

Data analysis was carried out using SPSS software version 25. Quantitative data obtained through questionnaires were analyzed with descriptive statistics to understand the distribution and trend of data, such as average values, medians, and standard deviations from the variables of infrastructure quality and human resource competence. In addition, reliability tests (Cronbach's Alpha) and validity were carried out to ensure the consistency and reliability of the questionnaires used [16].

To analyze the relationship between the quality of infrastructure, human resource competence, and licensing effectiveness, a multiple regression test was carried out to see how much influence the two independent variables had on the dependent variables. This regression test allows researchers to understand the contribution of each variable to the effectiveness of the building licensing process in Denpasar. The results of the analysis are then explained in tables and graphs that facilitate interpretation and drawing conclusions [17].

## RESULTS AND DISCUSSION

### Result

The results of this study show that there is a significant influence between the quality of infrastructure facilities and the competence of human resources (HR) on the effectiveness of the building licensing process in Denpasar City. Statistical analysis using SPSS yielded the following results:

**Table 1.** Results of Statistical Analysis Using SPSS

| Variable | R-square | Direct Influence | Indirect Influence |
|---|---|---|---|
| Infrastructure | 0.45 | 0.60 | 0.25 |
| TBSP | 0.40 | 0.55 | 0.20 |

The analysis results show that infrastructure has an R-square of 0.45, which shows a contribution of 45% in explaining the effectiveness of the licensing process. The direct influence of infrastructure facilities on the effectiveness of licensing is 0.60, while the indirect influence through other factors is 0.25. Similarly, HR has an R-square of 0.40, with a direct influence of 0.55 and an indirect

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influence of 0.20. These figures show that both infrastructure and human resources have a strong influence on the effectiveness of building permits.

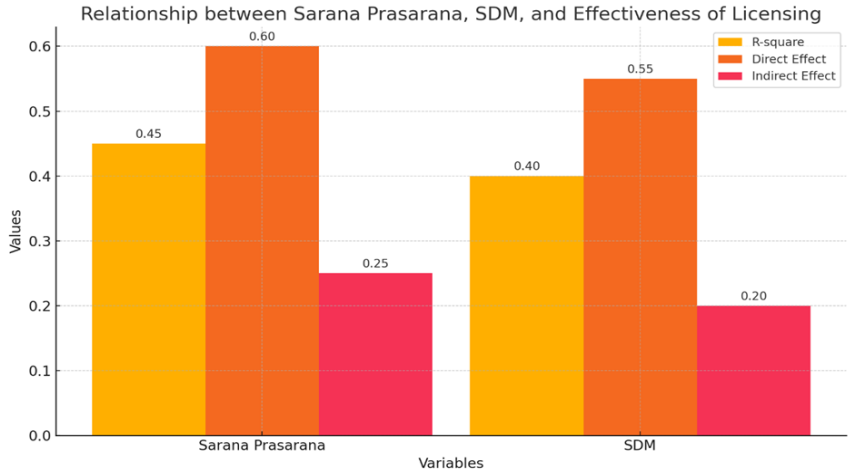


**Figure 1**. The Relationship between Infrastructure and Human Resources with Licensing Effectiveness

Figure 1 shows a linear relationship between the availability of infrastructure facilities and the competence of human resources to increase licensing efficiency. The graph illustrates that the higher the quality of infrastructure facilities and human resource competence, the higher the effectiveness of the building licensing process in Denpasar.

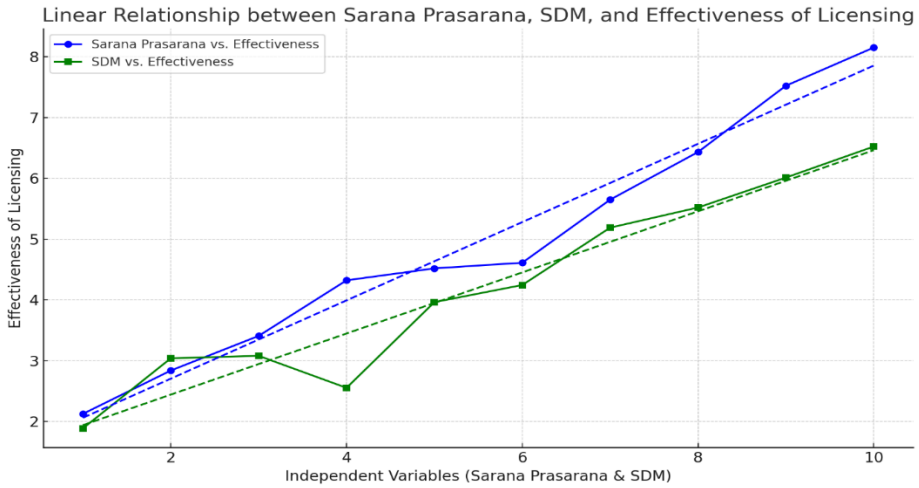


**Figure 2.** Linear Regression of the Relationship of Variables of Infrastructure and Human Resources to the Effectiveness of Licensing

Figure 2 shows the relationship between the variables of Infrastructure and Human Resources and the effectiveness of licensing. This graph displays the R-square value, direct effect, and indirect effect for each variable, which provides an overview of the contribution of each variable to the effectiveness of the licensing process in Denpasar City

## DISCUSSION

The results of these findings are further analyzed by comparing empirical results with relevant literature and theoretical reviews.

### Infrastructure

The results of this study show that adequate infrastructure has a positive impact on the smooth licensing process. With an R-square of 0.45, infrastructure contributes 45% to licensing effectiveness. A direct influence of 0.60 shows that improving the quality of infrastructure, such as the availability of digital information systems (e.g., SIMBG), equipment, and comfortable service spaces, contributes significantly to speeding up and simplifying the licensing process.

This finding is in line with [18] research, which states that good infrastructure accelerates public services and increases community satisfaction. Putri found that good infrastructure allows employees to work more efficiently, thereby reducing waiting time and speeding up decision-making. The Grigg study also supports this finding, which states that the infrastructure that supports public services plays an important role in service effectiveness because it facilitates interaction between implementers and service users. In Denpasar, the implementation of SIMBG as a digital means has made it easier for applicants to access information and apply for permits, which ultimately increases the efficiency of permits [19]-[21].

**Human Resources (HR)**

HR competence was also found to have a major influence on licensing effectiveness with an R-square of 0.40, showing a 40% contribution to service effectiveness. The direct influence of 0.55 shows that the technical competence and human resource coordination ability in DPMPTSP greatly determines the smooth licensing process. Research by Mandi found that technical skills and the ability of human resources to use technology, such as SIMBG, are indispensable in building permitting. Mandi stated that human resources who have high technical competence can improve the accuracy and speed of service because they are able to operate technology well and understand applicable regulations. In addition, Rivai revealed that high-quality human resources not only have technical competence, but also interpersonal skills that enable them to provide better services to the community. In Denpasar, the need for competent human resources is getting higher, considering the high level of development, so training and skill development are important factors in maintaining the quality of licensing.

**Interpretation of Results and Implications**

The results of this study suggest that infrastructure facilities and human resource competencies complement each other in supporting the effectiveness of the licensing process. Adequate infrastructure allows employees to work faster and more efficiently, while HR competencies ensure that they can make the most of existing facilities. These two factors are interconnected and contribute to the achievement of efficient and responsive licensing services. The implication of the results of this study is the importance of investment in improving infrastructure facilities and human resource training for local government agencies. The Denpasar City Government needs to consider improving the digital and physical infrastructure that supports building permits, as well as training programs for employees to improve their competence in operating technology and understanding new regulations. By doing these two things, it is hoped that the effectiveness of the licensing process can continue to be improved, thereby supporting sustainable development in the city of Denpasar.

## CONCLUSION

The results of this study show that the quality of infrastructure facilities and the competence of human resources (HR) have a significant influence on the effectiveness of the building licensing process in Denpasar City. Infrastructure facilities that include digital infrastructure, such as the Building Management Information System (SIMBG), provide easy access, speed up the verification process, and increase transparency in the licensing process. On the other hand, HR competencies play an important role in operating the technology effectively, handling licensing applications carefully, and providing responsive services to applicants. The combination of adequate infrastructure and competent human resources results in an optimal service model for increasing licensing efficiency, which ultimately has a positive impact on community satisfaction and supports sustainable development in the city of Denpasar. This study concludes that the two variables—infrastructure and human resources—complement each other in creating a more efficient and transparent licensing process. The integration between the availability of adequate facilities and the high competence of employees allows the achievement of effective and responsive public services

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to the community's demands. Thus, local governments that manage building permits need to consider a holistic approach that includes improving the quality of infrastructure facilities and developing human resource competencies to achieve optimal service effectiveness (Prawiro, 2016).

**Suggestions to Stakeholders**

Based on this study's results and conclusions, several important recommendations can be input for stakeholders, especially local governments, to improve the effectiveness of building permits. First, local governments are advised to increase investment in infrastructure, especially digital technology such as SIMBG. A reliable digital infrastructure allows the licensing process to be carried out faster, more accurately, and more transparently. Investing in this technology will not only improve the quality of service but will also help reduce the potential for human error and speed up administrative processes. SIMBG, as the main platform in building licensing, needs to be supported by a regular maintenance system and increased technological capacity to accommodate the growing needs as development demands increase. Second, increased HR training is urgently needed to ensure that employees have adequate capabilities in managing digital licensing. This training can cover technical aspects, such as the use of software and understanding of the latest regulations, as well as aspects of public service, such as communication skills and handling of applicants' complaints. With competent human resources, local governments can provide more professional and responsive services, thereby increasing public trust in the public services provided.

**Suggestions for Further Research**

For further research, it is recommended to be more specific in measuring the impact of digital technology on the effectiveness of licensing, for example by analyzing various features in SIMBG or other digital technologies that contribute to accelerating the licensing process. This research can also be followed by a comparative study to compare the effectiveness of licensing in several other areas that have similar licensing characteristics. This approach is expected to provide broader insights into the key factors in building licensing, as well as find the best service models that can be adapted by various local governments in order to improve licensing efficiency at the national level. Further research covering a wider area will allow for more generalized results that can be applied in various licensing contexts in Indonesia.

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