

Analysis and Design of Tax Incentive Facility System in the Nusantara Capital City at the Directorate General of Taxes (DGT)

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Abstract—The government of Indonesia is attempting to enhance economic development and equality by planning to move the capital city. The nation's capital is located in the new capital, Nusantara, also known as Ibu Kota Nusantara (IKN), a special provincial-level regional authority. The Directorate General of Taxes (DGT), which reports to the Ministry of Finance of the Republic of Indonesia, is in charge of managing taxation in the country. One of DGT's contributions to the success of capital migration is the provision of tax incentives. The goal of IKN's tax incentives is to encourage investment and economic expansion. However, applying for tax incentives entails several intricate rules and criteria, and doing it by hand raises the possibility of human mistakes in the reporting, computation, and data entry processes. Tax incentives in IKN can be provided more effectively, transparently, and user-friendly for all parties by using technology-based services. IKN's attractiveness as an investment destination may be increased by utilizing technology in tax incentives. Unified Modeling Language (UML) is used in this study to show the system design. The system design generates use case diagrams, activity diagrams, class diagrams, entity relationship diagrams (ERD), and user interface designs. The study also includes non-functional requirements, data management, physical architecture, and development strategies.

Keywords— Analysis, Design, UML, Tax Incentives, IKN.

I. INTRODUCTION

The practice of moving a country's capital city is common around the world. The United States, for example, recently relocated its capital to Washington DC. Previous locations included Philadelphia, Baltimore, Lancaster, York, Princeton, Annapolis, Trenton, and New York. Similar events occurred in several other nations. Among others, such as Russia, Pakistan, Germany, Nigeria, and South Africa [1]. Malaysia followed suit in 1999, when it relocated its capital from Kuala Lumpur to Putrajaya as part of a national push to equalize economic development [2].

The Indonesian government's plan to move the National Capital is a strategic step toward encouraging economic equality and national growth. This initiative is aided by the issuing of Law Number 3 of 2022 concerning the National Capital, which establishes a new Capital City entitled Ibu Kota Nusantara (IKN) with special government status at the province level [3]. One of the characteristics of IKN development, as mentioned in Law No. 3 of 2022, is that it is a smart, green, and sustainable city. IKN is expected to be able to properly manage resources and deliver good services. One of the fundamental ideas for the growth of the IKN region,

along with forest city and sponge city, is the smart city concept. This concept is carried out by incorporating digital and technology factors, which can give significant benefits to IKN management. The development of IKN prioritizes six components: access and transportation, environment and climate, security and safety, public sector, urban systems, and liveability and dynamism [4]. The government's goal in building the IKN is to establish a modern, sustainable metropolis with high-quality infrastructure that will balance the development on the island of Java [5].

The Directorate General of Taxes (DGT), which is part of the Ministry of Finance, is critical to guaranteeing the success of the capital city move through effective tax revenue management. Tax incentives, as outlined in Government Regulation Number 12 of 2023, are one of the most important instruments used. This regulation contains five regulatory scopes: business licensing, ease of doing business, investment facilities, supervision, and assessment. As per paragraph 3 of article 17 of the law, business players defined in the agreement are granted usufructuary rights and guarantees of certainty for the duration of construction rights by the IKN Authority. Additionally, the legislation provides building rights for a maximum of 190 years spread over two 95-year cycles, with three stages separated by each cycle. Building rights are granted for a maximum of 35 years in the first stage, 25 years in the second, and a further maximum of 35 years in the third [6]. Following Government Law No. 12 of 2023, the Government of Indonesia issued Law No. 28 of 2024 of the Minister of Finance (PMK 28/2024) to promote the development of IKN. This regulation seeks to provide fiscal and non-financial incentives to encourage entrepreneurs to participate in the IKN's construction and development. Tax incentives are used as fiscal incentives, and streamlined licensing processes are used as non-fiscal incentives. The tax incentive schemes established take many forms, including exemptions from Value Added Tax (VAT), Sales Tax on Luxury Goods (PPnBM), and income tax reductions and exemptions for specific parties participating in the IKN [7].

However, offering these benefits is not easy; there are several conditions and standards that Taxpayers must fulfill. The human error risk associated with data entry, computations, and reporting is significantly increased by the manual incentive submission process, which also slows down validation and verification. To improve efficiency, accessibility, and transparency in the IKN tax incentive

program, this condition necessitates the use of technology. This study will use Unified Modeling Language (UML) modeling to discuss the design of a tax incentive facility system in the IKN. This method is projected to result in more effective and efficient management of tax incentive services, as well as help the IKN expand as a competitive economic center on a global scale. This study revealed several main concerns, including the complexity of incentive requirements and criteria that applicants find difficult to understand, manual processes that hinder validation and verification, and the lack of a structured system to administer tax incentives in the IKN. Within the scope of this study, the focus will be on specific tax incentives such as VAT and PPnBM exemptions, income tax reductions, and tax rate reductions, with the outcome being system analysis and UML diagram designs rather than application development. The goal of this research is to create an integrated tax incentive facility information system that can assist the management of tax incentive services in the IKN following the DGT's business requirements. This study is designed to help the DGT identify the needs for a sustainable taxation system while also contributing to future tax system design research and analysis.

II. RESEARCH METHOD

This study uses qualitative methodologies with a focus on specific case studies at DGT. This is a qualitative study because the data was collected through interviews, observations, and document examinations. Qualitative research methods are used to research natural object conditions, where researchers are key instruments. Data collection techniques are carried out by triangulation (combination), data analysis is inductive, and qualitative research results emphasize meaning rather than generalization [8].

This study employs a case study methodology. The case study approach is used in research to explore programs, events, processes, and activities aimed at one or more persons. The purpose of case studies is to give a thorough explanation of a specific case or phenomena[9]. The case study was carried out at the DGT, with a focus on the Directorate of Information and Communication Technology (Dit. ICT), which is responsible for information technology development. This study focuses on the design of the tax incentive facility application system utilizing UML modeling. The informants in this study were chosen using purposive sampling procedures, which involved selecting informants based on specific criteria that were relevant to the study's objectives.

Case study research is divided into stages, which include planning, data gathering, data analysis, interpretation, and reporting [10].

Fig. 1 illustrates the research stages as follows:

1. Problems Identification. At this step, interviews and document studies are used to identify problems. During this step, problems and research questions are identified.
2. Literature Review. At this point, it is carried out by understanding the relevant book or journal and searching for the best theory for this research. Studying similar studies can be used as a comparison to determine which

strategy is best for current study. The literature review was performed to create the research framework for this study.

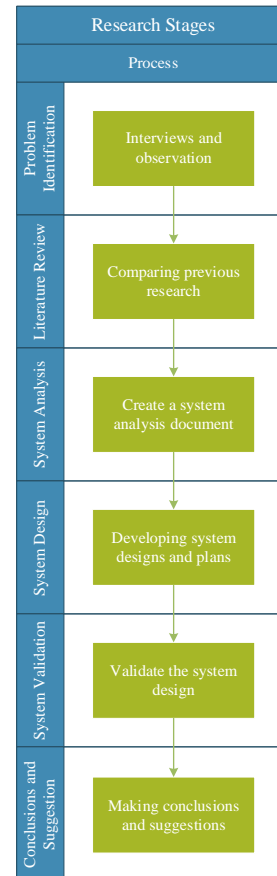


Fig. 1. Research Stages

3. System Analysis. At this point, it is accomplished by the coding handiwork technique. The interview results and document study are then combined to create meaningful data categories. The analytical results are then poured into UML notations such as use-case diagrams, activity diagrams, class diagrams, and entity relationship diagrams.
4. System Design. At this step, a system design is constructed based on the results of the prior system analysis. This study's design comprised user interface design, data management design, and physical architecture design.
5. System Validation. At this point, validate the system using the stated method. System validation ensures that the designed system meets user needs and expectations.
6. Conclusions and Suggestions. The final step in this study is to draw conclusions and give recommendations for the research that has been conducted.

III. RESULT AND DISCUSSION

A. System Analysis

Based on observations and interviews from the problem identification stage, it was discovered that the IKN lacked support for the tax incentive management system that taxpayers need when submitting applications. The analysis results reveal that the DGT must establish an integrated tax

incentive management system in the IKN to support anticipated business operations. The identified business processes include applications for MSMEs' Final Income Tax facilities, Article 21 Income Tax Borne by the Government (PPh 21 DTP), Notice of Tax Exemption (SKB) Sales Tax on Luxury Goods (PPnBM), Certificate of Non-Collected VAT (SKTD PPN), monitoring incentive facility applications, and printing of legal products for incentive facility applications. Each business process will be illustrated with a use case diagram to help visualize the interactions between actors and systems in each scenario.

incentive facilities. Additionally, taxpayers can view monitoring, BPE, and certificates.

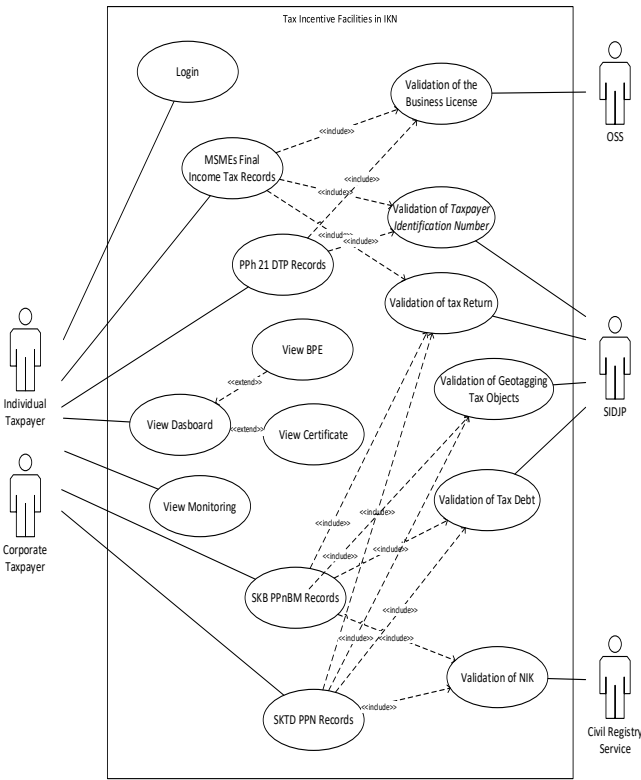


Fig. 2. Use Case Diagram Results

A Use Case Diagram is a visual representation of the interactions between users (actors) and a system, showcasing the different ways users can interact with the system to achieve specific goals [11]. Fig. 2 depicts a Use Case Diagram with 5 actors and 15 use cases, including login functions, view dashboard, apply for various tax incentive programs, printing Electronic Receipts (BPE), and printing Certificates.

Based on the use case diagram, an activity diagram is developed to provide a visual representation of the processes required to accomplish an activity. An activity diagram is a visual representation used in software engineering to illustrate a system or process's workflow. It shows the sequence of activities, including decisions, parallel processes, and the flow of control from one activity to another [12].

Fig. 3 depicts the general process of applying for tax incentive facilities in the IKN by taxpayers. Taxpayers must be registered in the DGT system and log in with their TIN and password. Taxpayers then submit their application for IKN tax

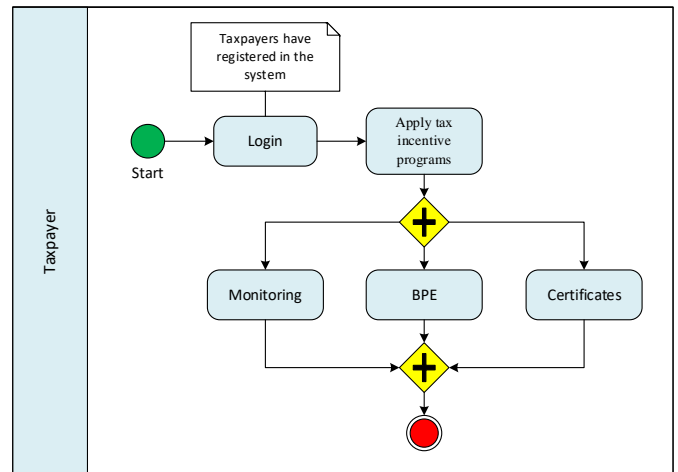


Fig. 3. Activity Diagram Results

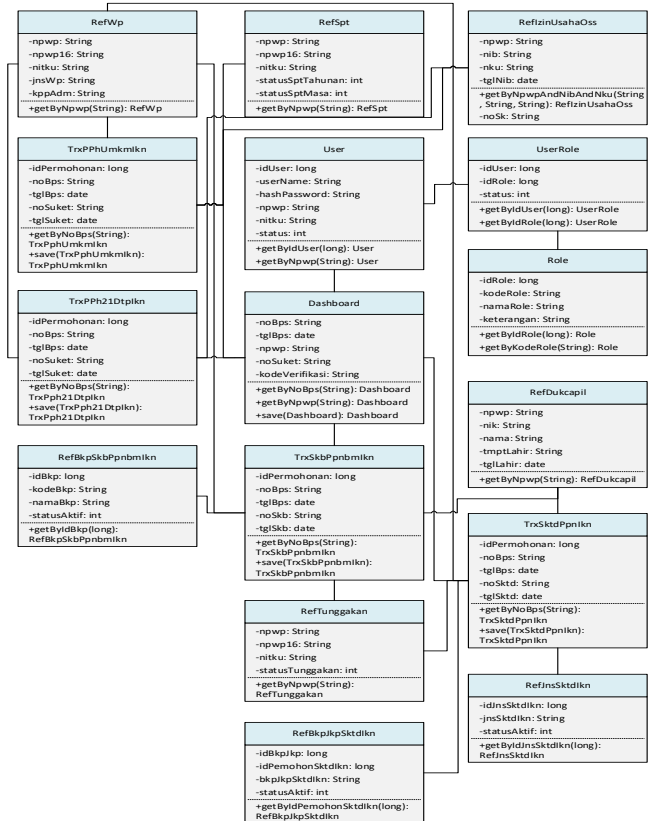


Fig. 4. Class Diagram Results

A class diagram is a static structure diagram that is commonly used in software engineering. It depicts the classes in the system along with their properties, functions, and connections. Class diagrams are essential to the object-oriented design process because they assist in visualizing a system's structure and behavior [13]. Fig. 4 depicts a class diagram with 16 classes, each containing attributes and relationships to the others.

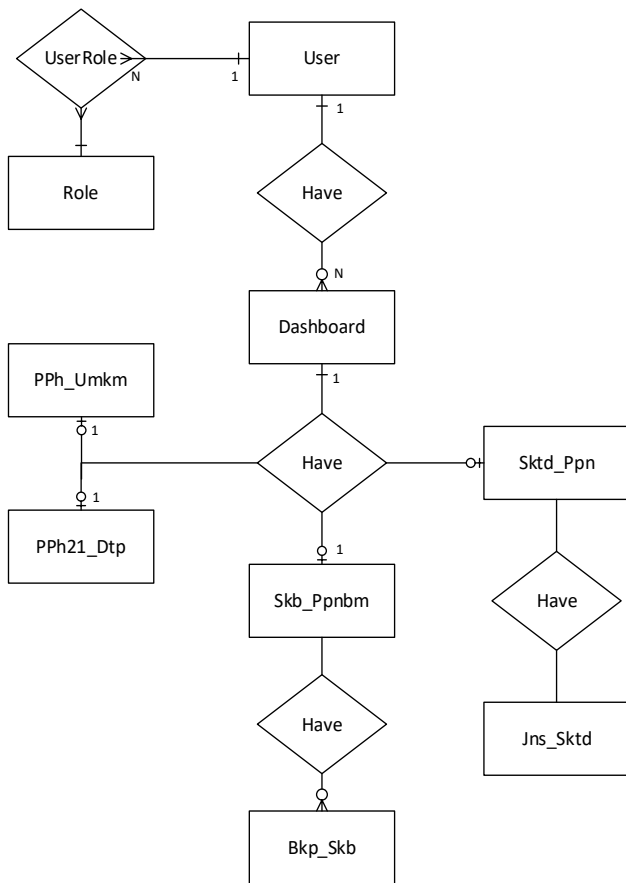


Fig. 5. ERD Results

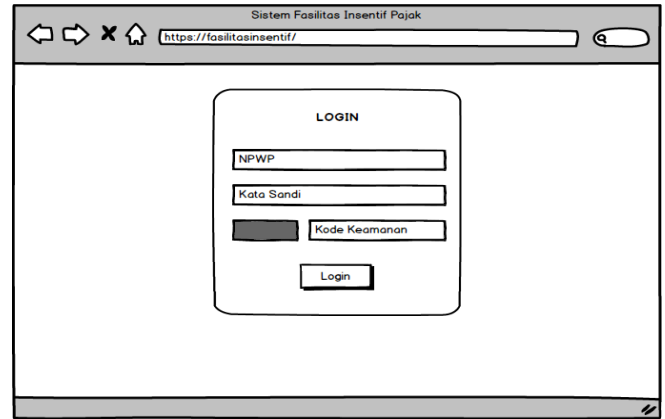


Fig. 6. Login Menu Interface Design

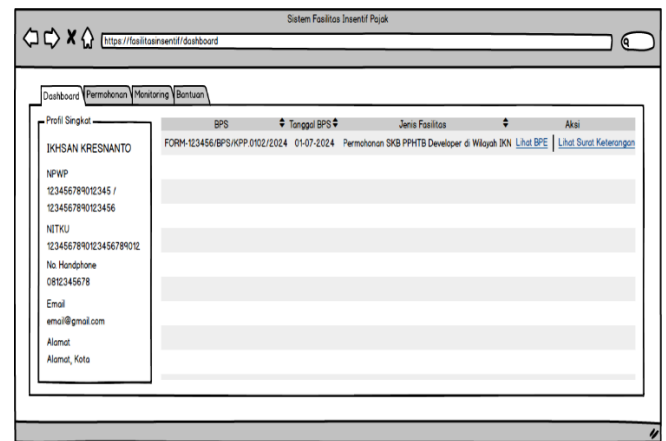


Fig. 7. Dashboard Menu Interface Design

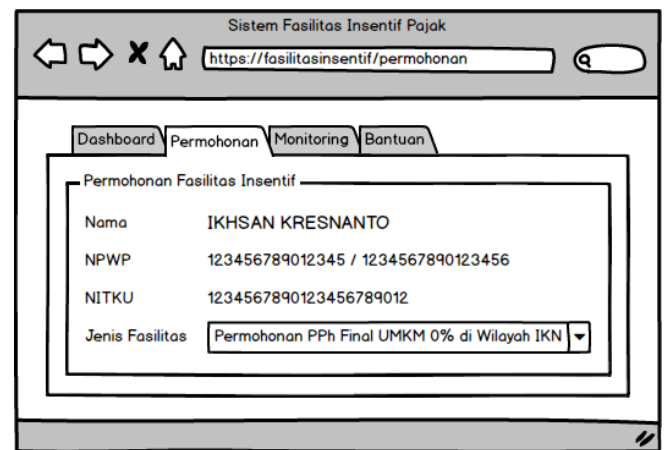


Fig. 8. MSMEs' Final Income Tax Design Page

ERD is an important tool for database design because it provides a visual representation of a database's structure. ERD is a diagram that shows the entities and relationships within a system [14].

B. System Design

User interface (UI) design is the process by which designers create interfaces in software or digital devices with a focus on appearance or style. Designers strive to design interfaces that are both user-friendly and enjoyable. UI design includes graphical user interfaces and various forms[15]. The IKN tax incentive facility's user interface design consists of a login page, a dashboard, applications for various tax incentives, monitoring, and help. This design is in line with the user needs and the business process flow that has been created.

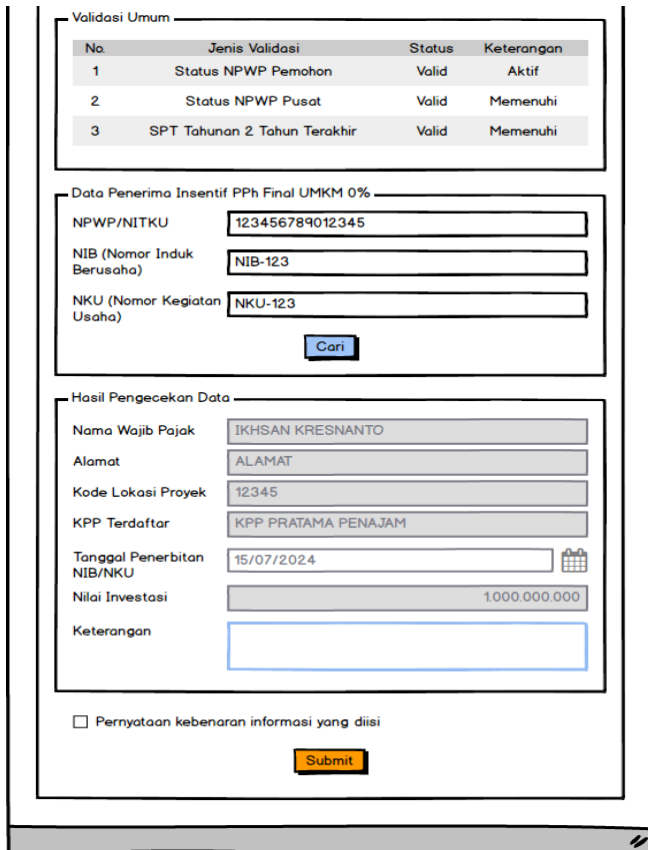
Fig. 6 depicts the login menu from which users can access the system by providing credentials such as username and password.

Fig. 7 depicts the main menu that shows when the user has successfully logged in, which includes a summary display of the user's brief profile information as well as a list of submitted tax incentive facilities.

Fig. 8 depicts a page for requesting a final income tax benefit for MSME taxpayers.

Fig. 9 depicts the final stage page used to apply for the MSMEs Final Income Tax incentive if all validation processes have been completed successfully. After completing the application, the user will be returned to the dashboard menu.

Fig. 10 depicts the submission page for the PPh 21 DTP Tax incentive if all validation processes have been completed successfully. After completing the application, the user will be returned to the dashboard menu.



Validasi Umum

No.	Jenis Validasi	Status	Keterangan
1	Status NPWP Pemohon	Valid	Aktif
2	Status NPWP Pusat	Valid	Memenuhi
3	SPT Tahunan 2 Tahun Terakhir	Valid	Memenuhi

Data Penerima Insentif PPh Final UMKM 0%

NPWP/NITKU: 123456789012345
 NIB (Nomor Induk Berusaha): NIB-123
 NKU (Nomor Kegiatan Usaha): NKU-123

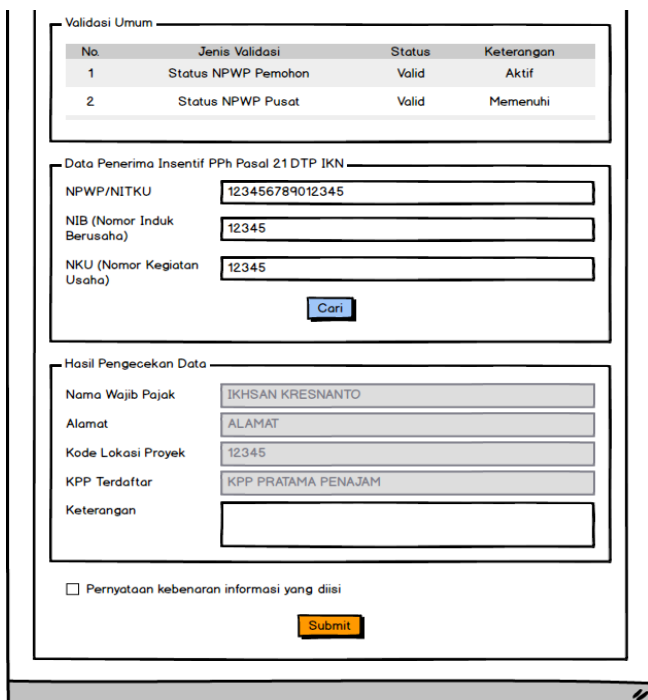
Hasil Pengecekan Data

Nama Wajib Pajak: IKHSAN KRESNANTO
 Alamat: ALAMAT
 Kode Lokasi Proyek: 12345
 KPP Terdaftar: KPP PRATAMA PENAJAM
 Tanggal Penerbitan NIB/NKU: 15/07/2024
 Nilai Investasi: 1.000.000.000

Keterangan:

Pernyataan kebenaran informasi yang diisi

Fig. 9. MSMEs' Final Income Tax Application Submission Design Page



Validasi Umum

No.	Jenis Validasi	Status	Keterangan
1	Status NPWP Pemohon	Valid	Aktif
2	Status NPWP Pusat	Valid	Memenuhi

Data Penerima Insentif PPh Pasal 21 DTP IKN

NPWP/NITKU: 123456789012345
 NIB (Nomor Induk Berusaha): 12345
 NKU (Nomor Kegiatan Usaha): 12345

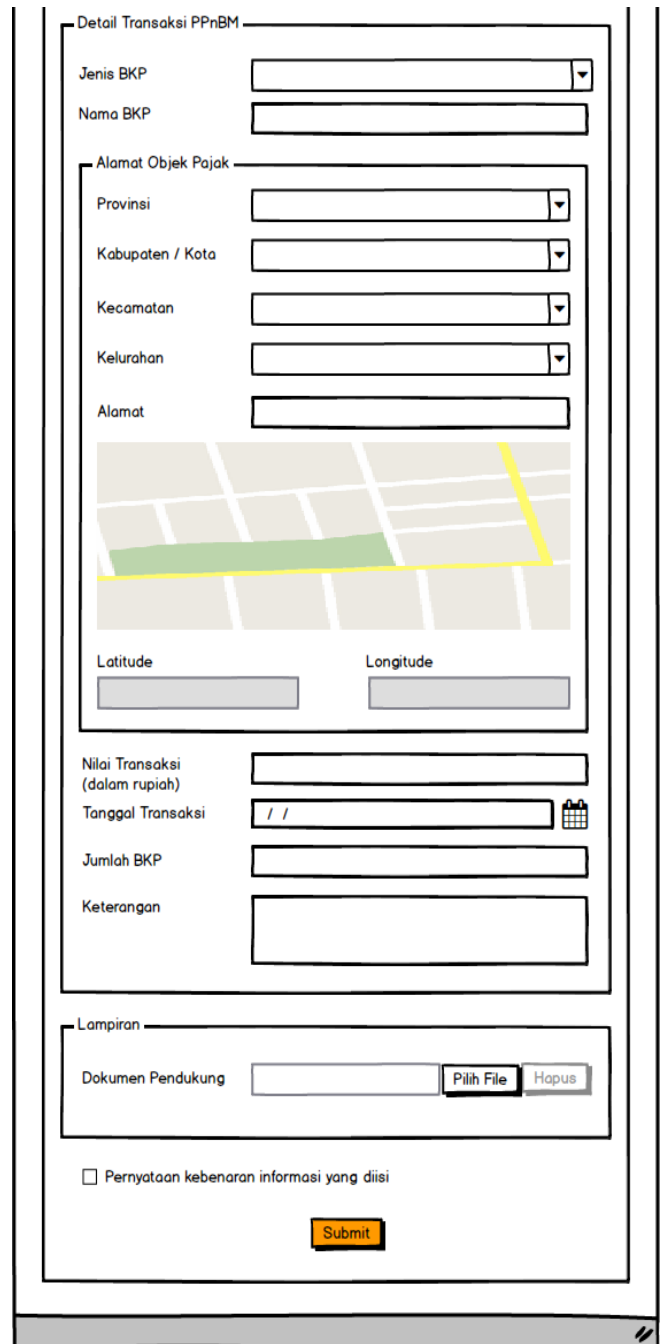
Hasil Pengecekan Data

Nama Wajib Pajak: IKHSAN KRESNANTO
 Alamat: ALAMAT
 Kode Lokasi Proyek: 12345
 KPP Terdaftar: KPP PRATAMA PENAJAM
 Keterangan:

Pernyataan kebenaran informasi yang diisi

Fig. 10. PPh 21 DTP Submission Design Page

Fig. 11 depicts the submission page for the SKB PPnBM Tax incentive if all validation processes have been completed successfully. After completing the application, the user will be returned to the dashboard menu.

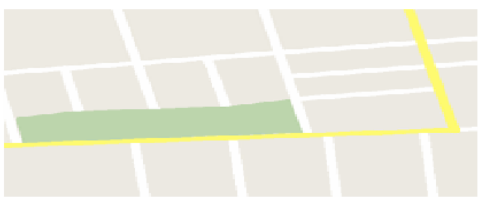


Detail Transaksi PPnBM

Jenis BKP:
 Nama BKP:

Alamat Objek Pajak

Provinsi:
 Kabupaten / Kota:
 Kecamatan:
 Kelurahan:
 Alamat:



Latitude: Longitude:

Nilai Transaksi (dalam rupiah):
 Tanggal Transaksi:

Jumlah BKP:
 Keterangan:

Lampiran

Dokumen Pendukung:

Pernyataan kebenaran informasi yang diisi

Fig. 11. SKB PPnBM Submission Design Page

Fig. 12 depicts the submission page for the SKTD PPN Tax incentive if all validation processes have been completed successfully. After completing the application, the user will be returned to the dashboard menu.

Fig. 13 depicts the monitoring page that is used to track the status and list of tax incentive facility applications submitted by users.

Fig. 14 depicts the help page used to assist users in submitting applications, understanding the terms and conditions, and resolving technical issues that may arise while using the system.

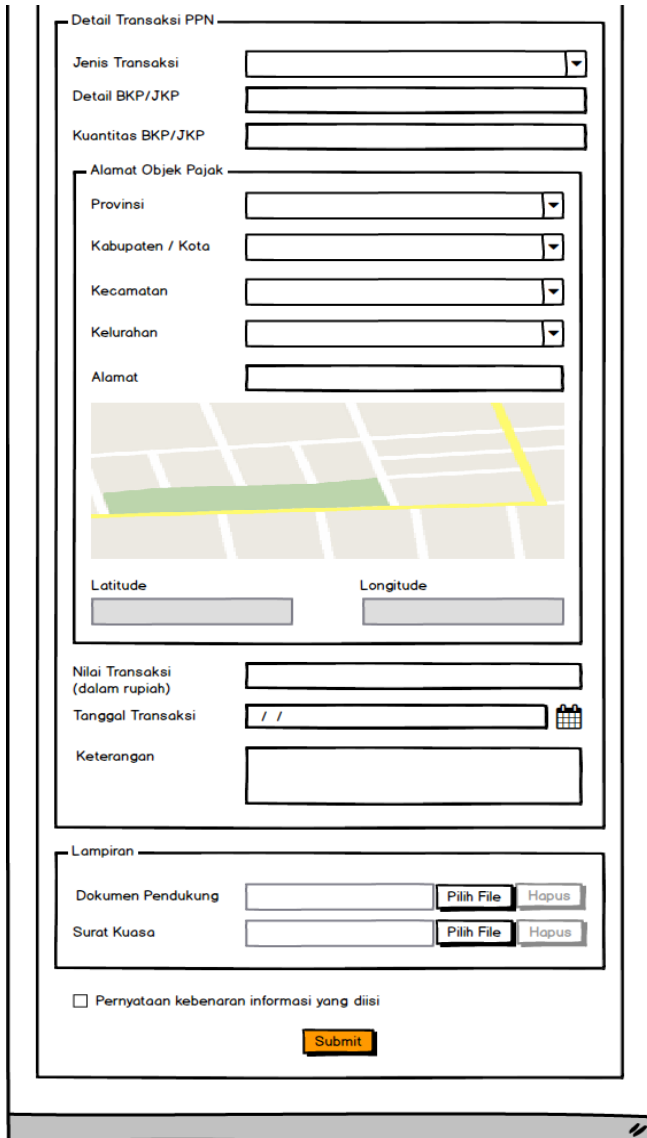


Fig. 12. SKTD PPN Submission Design Page

tasks between the client and server, resulting in a more efficient, manageable, and scalable system.

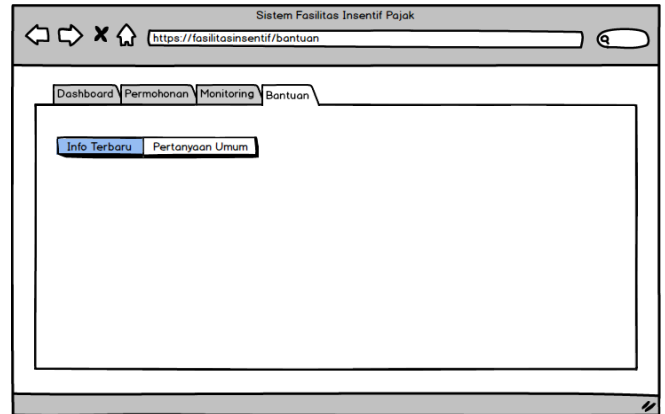


Fig. 14. Help Design Page

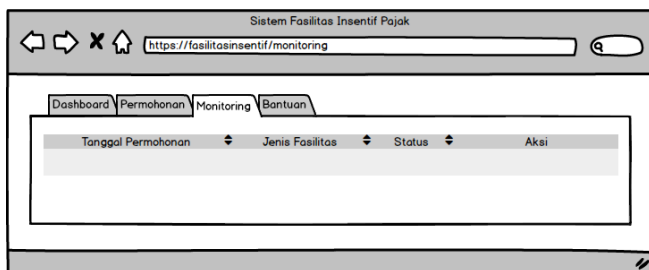


Fig. 13. Monitoring Design Page

Physical architecture design is the process of defining the physical components and their interactions in a system. Physical architecture design is critical for ensuring that a system's architecture can efficiently support its software components, satisfy performance requirements, and provide a stable and scalable solution for consumers and organizations [16]. The physical architecture design of the IKN Tax Incentive Facility system is client-server oriented, which splits

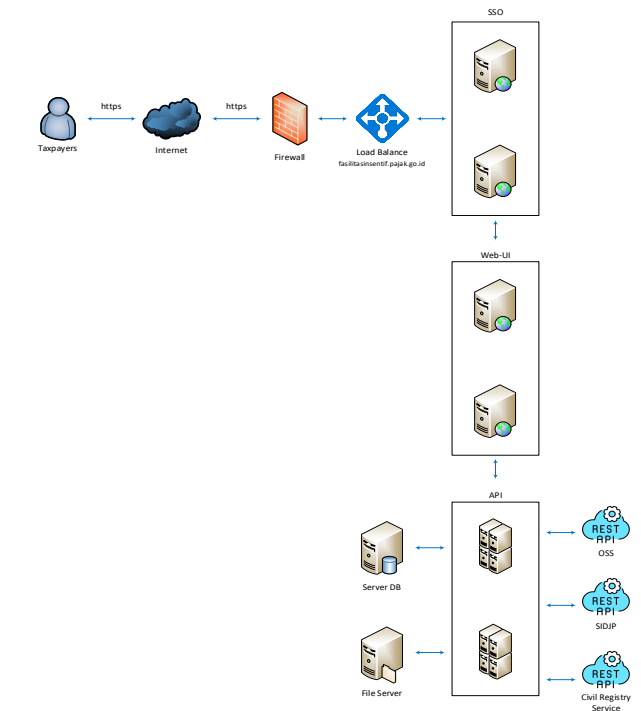


Fig. 15. Physical Architecture Design

Fig. 15 depicts the physical architecture of a client-server system, which includes firewalls, load balancers, application servers, and databases.

C. Model Validation

Model validation is the process of confirming that a model accurately represents the real-world system it is supposed to replicate or explain. This stage is crucial for ensuring that the design performs as expected when implemented [17]. The validation of the IKN Tax Incentive Facility system design aims to guarantee that the developed system fits the needs and standards that have been established. The system design validation process is separated into two stages: validation of system design functionality and validation of non-functional requirements. Users of Dit. ICT validated functional and non-

functional designs. Interviews revealed that consumers were confident that the design addressed the required functional and non-functional requirements, such as conforming to existing infrastructure and achieving desired integration.

IV. CONCLUSION

After studying the results of the analysis and design that have been carried out in this study, it can be concluded that the business needs in developing a tax incentive facility system in the IKN has been successfully identified, including applications for MSMEs Final Income Tax, PPh 21 DTP, SKB PPnBM, SKTD PPN, monitoring apps, and legal product printing.

This system is built with UML modeling, which contains Use Case Diagrams, Activity Diagrams, Class Diagrams, and Entity Relationship Diagrams (ERD) to represent data structures. User interface design is created based on user needs and business process flow, and it can be used as a reference in program development. The system design has been validated by users from the Dit. ICT, indicating that it meets the functional and non-functional requirements. The research findings can be used to establish a tax incentive facility system in the IKN or to incorporate new forms of tax incentives in future IKNs.

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