

Analysis and Design of Electronic Stamp Duty Information System at the Directorate General of Taxes (DGT)

Sandi Eka Yudha¹, Ravi Ahmad Salim²

¹Master of Information System Management, Business Information System, Gunadarma University, Indonesia

²Information System, Faculty of Computer Science and Information Technology, Gunadarma University, Indonesia

Abstract—Law Number 13 of 1985 concerning Stamp Duty which had been in effect for 37 years was finally replaced by Law Number 20 of 2020 concerning Stamp Duty. The important point regulated in the law is that the mechanism for paying stamp duty electronically until now there is no further regulation that regulates in detail the procedures and designs for electronic stamp duty. The purpose of this research is to determine the design of electronic Stamp duty that can accommodate the applicable terms and procedures, to determine the design of an electronic stamp duty information system that can accommodate business needs. The analysis was carried out using UML modeling which resulted in a functional model and a structural model. The electronic stamp duty design will use a digital signature in order to comply with the requirements and procedures for electronic stamp duty. Electronic documents that have been signed electronically will be affixed with an electronic stamp duty with a digital signature.

Keywords— Analisis, DGT, Digital Signature, Unified Modeling Language.

I. INTRODUCTION

Tax reform in Indonesia began in 1983 with the issuance of five new tax laws to replace the previous laws made by the Dutch colonial government. The laws issued are Law Number 6 of 1983 concerning General Provisions and Tax Procedures (KUP), Law Number 7 of 1983 concerning Income Tax (PPh), Law Number 8 of 1983 concerning Value Added Tax of Goods and Services and Sales Tax on Luxury Goods (PPN dan PPNBM), Law Number 12 of 1985 concerning Land and Building Tax (PBB) and Law Number 13 of 1985 concerning Stamp Duty.

Of the five tax laws, the law on Stamp Duty is a law that has been undergoing changes for a very long time since 1985. The amendment to the Stamp Duty law only took place in October 2020. The law has not yet been issued.

Reporting from the Kemenkeu.go.id website, the Minister of Finance, Mrs. Sri Mulyani, conveyed the important points of adjustment as outlined in the Stamp Duty Bill:

1. Equalization of taxation on paper documents and electronic documents.
2. The tariff in the new bill is in the form of a single tariff, which is IDR 10,000.
3. Refinement of settings regarding time of payable and subject of Stamp Duty
4. Payment of Stamp Duty using an electronic Stamp Duty.
5. Provision of exemption from the imposition of Stamp Duty on certain documents

6. Regulations regarding sanctions, both administrative sanctions and criminal sanctions
7. The adjustment of the value of the new Stamp Duty, will take effect on January 1, 2021

From the points above, the payment of Stamp Duty using an electronic Stamp Duty is one of the important adjustments in the Stamp Duty Law as a result of technological developments and the increasing activity of publishing electronic documents today. The electronic stamp duty will be used as a means of payment for the stamp duty on electronic documents owed by the stamp duty.

However, since Law Number 10 of 2020 concerning Stamp Duty was issued in October 2020, until now, a Regulation of the Minister of Finance has not yet been issued which explains in detail the mechanism for payment of Stamp Duty using an electronic Stamp Duty and there is no Electronic Stamp, and there is no available information system that can be used for payment of stamp duty on electronic documents.

Regarding on the above, this study will try to analyze application requirements and design an electronic Stamp Duty information system using the Unified Modeling Language (UML). Researchers will also propose an electronic Stamp Duty design that can accommodate the requirements and procedures in the Stamp Duty rules.

Several previous research to support the research being conducted are as follows:

1. *A UML based approach for analysis and design of tourism web portal (Shrestha, Wenan, Maharjan, Gaudel, Chun, & Jeong, 2020)*. This study aims to analyze and design the development of Web applications and Tourism Web Portals for Nepal. One of the official tourism websites in Nepal, welcomenepal.com, is used as an object in the case study. In this web development, this research uses several phases, including identify user requirements, system analysis and design, and design evaluation and implementation. In the system analysis and design phase, the researcher does not use behavior modeling but only uses structural behavior. The modeling is done using the unified Modeling Language (UML) with the diagrams used include use case diagrams and class diagrams.
2. *Analysis and design of hospital management information system based on UML (MA, Zhao, You, & Ge, 2018)*. This study aims to build a hospital management information system model. In this research, it is not explained in detail about the

method in requirements analysis. Requirement engineering is carried out up to the implementation model stage. The method used for modeling also uses UML. The UML diagrams used in this study are use case diagrams, class diagrams, and object diagrams.

3. *Software Development of Electronic Digital Signature Generation at Institutional Electronic Document Circulation (Chesnokov, Korochentsev, Cherckesova, Safaryan, Chumakov, & Pilipenko, 2020)*. This study aims to investigate the approach to the formation of digital signatures in the context of developing applications for making digital signatures in the circulation of electronic documents. The researcher did not explain the object of the case study and the method used by the researcher in order to analyze the current system. The scope of this research is to conduct a juridical basis study, analyze similar software, development of software architecture and algorithms as well as implementation and testing of software that is done.

II. RESEARCH METHODS

This research uses a type of qualitative research with a case study approach, where researchers enter the organization to observe behavior, processes or events, exercise control over what happens. In this research, the case studies are the Directorate of Tax Regulations I (Dit.PP I) as the authorized party in the Stamp Duty regulations and the Directorate of Information and Communication Technology (Dit.TIK) as the directorate of information technology development of the Directorate General of Taxes (DGT). The tax object of this research is the design of electronic Stamp duty and the Electronic Stamp Information System at the Directorate General of Taxes where the data to be processed is data from observations, interviews, and document studies.

The stages of the work process in the case study approach vary depending on the case, phenomenon or other limitations, but in general the stages are planning, design, preparation, collection, analysis and dissemination (Recker, 2013).

Based on Fig. 1. Research Stages below, the stages of the research carried out can be explained as follows:

1. Identification of research problems. At this stage, the identification of problems with interviews and document studies is carried out. The problems that arise and research questions are obtained in this stage.
2. Literature Review. At this stage, a literature search is carried out on theories related to research keywords and relevant previous research. This literature review is used to develop the research framework used in this study.
3. Preparation of Research Methods. Based on the research framework that has been made in the previous stage, the research method is then formulated. In the formulation of this research method, it is determined the research flow, data collection methods, instruments used in data collection and data analysis methods.
4. Analysis and Design. The analysis was carried out using the coding technique. The results of interviews and document studies are then analyzed by forming groups of data that will have meaning. Then the results of the analysis are poured into UML notations such as use cases,

class diagrams and sequence diagrams. From the results of the modeling generated from the analysis phase, then the design is carried out. In this study, the designs carried out include data management design, physical architecture design and human computer interaction design.

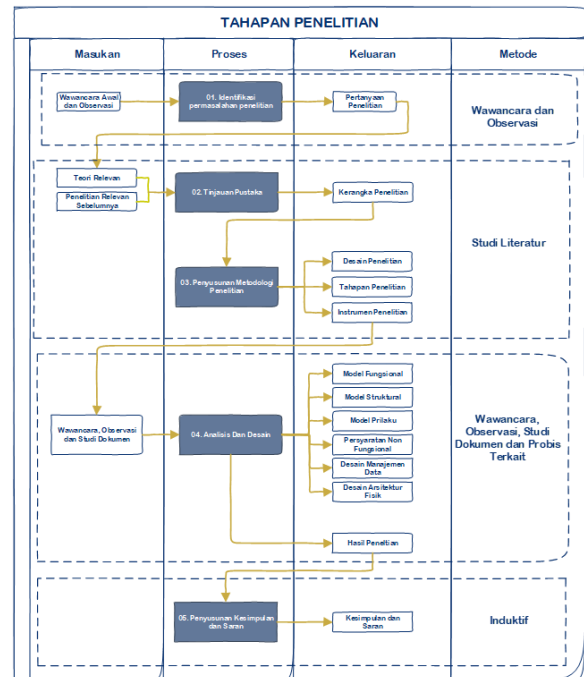


Fig. 1. Research Stages

5. Preparation of Conclusions and Suggestions. At this last stage, conclusions are made from the research that can answer research questions, as well as make suggestions that can be used for further research.

III. DISCUSSION & RESULTS

A. Electronic Stamp Duty Design Analysis

Based on the business needs of the electronic Stamp Duty design, the electronic Stamp Duty design must at least meet the following requirements:

1. Electronic Stamp duty must be affixed/affixed to electronic documents
2. The Electronic Stamp Duty must have a unique value/number
3. The Electronic Stamp must contain the date, month and year of affixing
4. The Electronic Stamp Duty must be able to coexist and not damage the Electronic Signature (TTE) value.

In order to fulfill the above requirements, the electronic Stamp Duty design can be in the form of affixing a picture/code to the electronic document, so that the electronic Stamp Duty design can use the watermarking process or the digital signature process. In order to determine which process is more appropriate to use in the design of electronic Stamp Duty, the researchers tried to compare the two processes.

The results of the comparison of electronic Stamp Duty designs between using digital signatures and using

watermarking are shown in Table 1. Comparison of Digital Signature and Watermarking.

TABLE 1. Comparison of Digital Signature and Watermarking

Electronic Stamp Duty Design Requirements	Digital signature	Watermarking
Pasted / affixed in electronic documents	✓	✓
Have a unique value/number	✓	✓
Loading the date, month and year of affixing	✓	✓
Side by side and does not tamper with the Electronic Signature (TTE) value	✓	X

From the comparison table above, it can be seen that digital signatures can meet all the design requirements of electronic Stamp Duty, while watermarking does not meet one of the requirements, namely electronic Stamp Duty can damage the value of electronic signatures.

The problem arises when the watermark is affixed after the electronic document has been electronically signed. The watermarking will change the TTE value which causes the document to be invalid during verification. Watermarking and TTE validation were made using the Nitro PDF Pro application. Figure 2 shows an electronic document that has been signed electronically with a valid TTE value. Then the electronic document is added with watermarking using the Nitro PDF Pro application. Figure 3 shows an invalid TTE value for electronic documents that were previously signed electronically and then added watermarking.

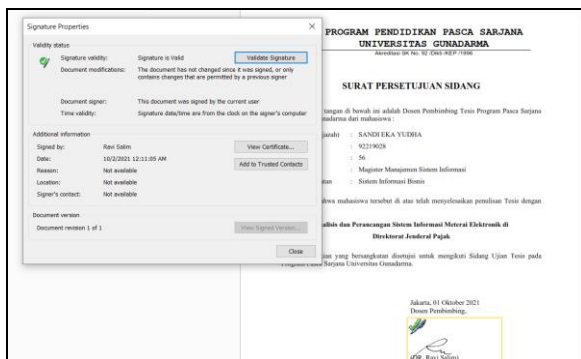


Fig. 2. Electronic Document with Digital Signatures

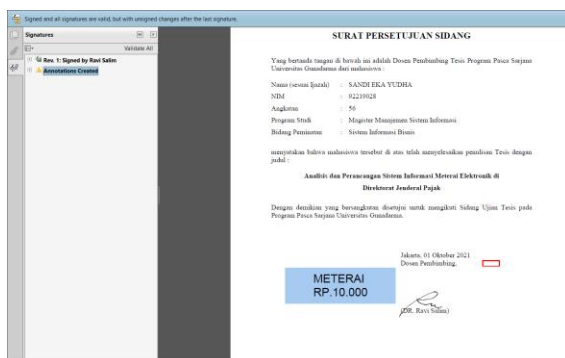


Fig. 3. Electronic Document with Watermarking

The use of electronic Stamp Duty designs with the Digital Signature process can meet all electronic Stamp Duty design

requirements. The picture shows that an electronic document that already has a TTE can be affixed with an electronic Stamp Duty with a digital signature process without destroying the value of the previous TTE. The affixing of electronic Stamp duty is carried out using a QR Code, the unique value of the electronic Stamp Duty can use the digital signature value, and the time of affixing the electronic Stamp Duty can also be known.

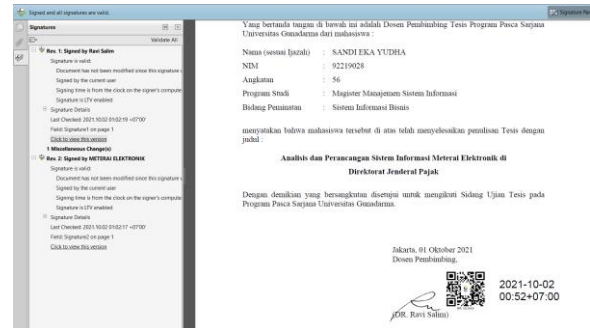


Fig. 4. Electronic Documents with an Electronic Signature (TTE) with Added Watermarking

The process of affixing an electronic Stamp Duty with a digital signature and proving the validity of the TTE is carried out using the Nitro PDF Pro application. Figure 4 shows that Electronic Documents that have been electronically signed can be electronically Stamp Duty with a digital signature process without destroying the value of the TTE.

Based on this analysis and proof, the electronic Stamp Duty design will use a digital signature so that it can meet all the requirements for the electronic Stamp Duty design.

B. Electronic Stamp Duty Information System Design

In this stage the researcher defines matters relating to the business process of affixing the electronic Stamp Duty as presented in subchapter above, becoming the functional requirements that will be accommodated in the Electronic Stamp Information System.

TABLE 2. Business Process of Affixing Electronic Stamp Duty

No	Business Process
1	Register as an electronic Stamp Duty user
2	Register as an electronic Stamp Duty collector
3	Approving the use of electronic Stamp Duties
4	Setting the electronic Stamp Duty collector
5	Approved the appointment of electronic stamp collector
6	Print the decree of the electronic stamp collector
7	Buying an electronic stamp duty for the prepaid method
8	Pay for the collection of electronic stamps with the postpaid method.
9	Updating the electronic Stamp Duty quota
10	Update status of electronic stamp collection payment
11	Affix the electronic Stamp Duty
12	Reporting electronic stamp collection

The list of business processes that need to be accommodated in the electronic Stamp Duty system is shown in Table 2. Furthermore, each business process will be described using a use case diagram.

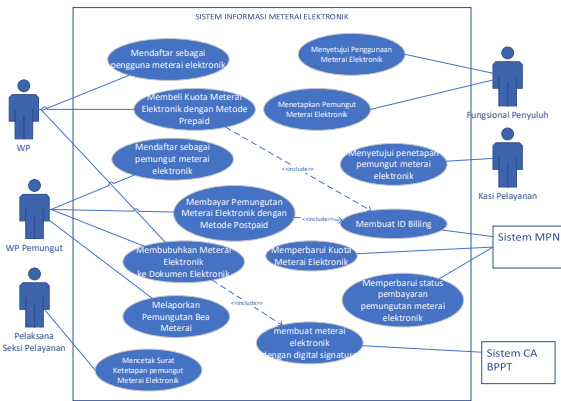


Fig. 5. Use Case Diagram of Electronic Stamp Duty Information System

C. Physical Architectural Design

Physical architectural design is used to determine the compatibility between software and hardware used. In general, network architecture is divided into 3 types, namely: server-based architecture, client-based architecture, and client-server-based architecture. Here is a comparison of the pros and cons for each architecture.

TABLE 3. Advantages and Disadvantages of Architectural Types

No	Advantages	Disadvantages
Server based	<ul style="list-style-type: none"> Simple and works well Low complexity in updating process 	<ul style="list-style-type: none"> Along with increasing process requests, server speed will decrease Difficult to make minor upgrades
Client Based	<ul style="list-style-type: none"> Simple and works well Server is not working too hard 	<ul style="list-style-type: none"> Large data on the server must move to the client which can cause client overload
Client-Server Based	<ul style="list-style-type: none"> Scalable (easy to add or reduce storage or processing capacity) 	<ul style="list-style-type: none"> More complex More expensive and complicated Updates can occur on the client or server side

The client-server based architecture was chosen because it has low infrastructure costs, high development costs, ease of development, high interface capabilities, good security controls, and high scalability. The physical architecture design proposed in this study can be seen in the following figure.

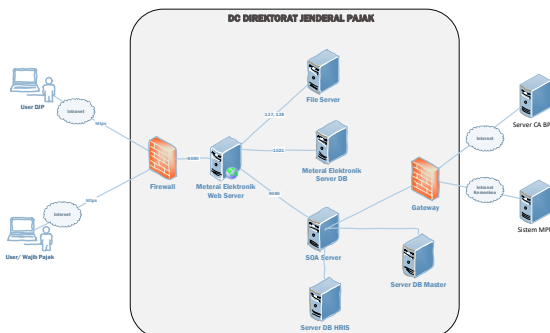


Fig. 6. Electronic Seal Information System Physical Architectural Design

The explanation from Fig. 6 is that the application is used from 2 different sides, from users or taxpayers with internet access, and from DGT users with intranet access. Identity

access management for internal users uses a service to the HRIS system, while for the Taxpayer user, validation is carried out using a service to the DGT master data. All system records, both recording and loader results, are stored in the DB Server for Electronic Stamp. While some of the files that are formed will be stored on the file server. To maintain data quality, elements such as the TIN are validated using services to the DGT Master Data.

IV. CONCLUSIONS

Some of the conclusions that can be drawn from this research are as follows:

1. From the analysis stage carried out, an electronic Stamp Duty design was obtained using a digital signature that could meet the requirements for an electronic Stamp Duty design, and an electronic Stamp Duty information system design for the process of registration, affixing, paying and reporting electronic Stamp Duties;
2. The design of this electronic stamp duty information system in theory and based on user validation is able to fulfill the business process of affixing electronic Stamp duty at the Directorate General of Taxes.

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