



Design of Online Certificate Data Processing Information System in Metrology Jakarta

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ABSTRACT

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In the current era of globalization in the Jakarta Metrology Management Unit Services, currently completing work is still manual, both receipt of goods, recording/registration, to the archiving that has an important role in an office, if the records are poorly managed, it can be difficult to find data that has been stored and finally can hamper the next stage of the work process. Therefore the Jakarta Metrology Management Unit needs an application or a way to complete the work efficiently and effectively so that data processing work can be done quickly and accurately. This web-based information system can also facilitate registrants in checking data, so the authors in designing this information system using the sublime text application and by using the waterfall method, in designing this information system are modeled by Unified Modeling Language (UML). Using the Hypertext Preprocessing (PHP) programming language with Mysql as a database. The final result of this study is so that companies can more easily process data. Online Certificate Data Processing Information System based on the web, on this website the registrant can see directly their data process so that after completing the certificate.

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1. Introduction

In the Metrology Management Unit Service currently in completing work is still a good manual receipt of goods, recording/registration, archiving to making a register, the computer is only used as a typewriter. In completing work carried out effectively and efficiently in accordance with technological developments.

By utilizing the internet, the use of computers throughout the world is possible to communicate with each other and share information by exchanging e-mails, connecting to other computers, sending and receiving files. In addition, one of the facilities from the internet, the web, the web is a facility that is very helpful in various online-based activities, from the transaction of goods and services to exchanging information that can be done in this facility.

The problems that exist in the Metrology Management Unit to find the necessary data is very difficult and time-consuming, because it is still manual, so the research proposes an Application / Program to complete the work effectively and efficiently so that data processing work can be done quickly and accurately. To find out how the data processing system is currently running, the data processing at the agency can be done quickly and accurately

2. Theory

The waterfall model is a classic model that is systematic, sequential in building software. The name of this model is actually the "Linear Sequential Model". This model is often referred to as the "classic life cycle" or the waterfall method (Pressman (2015: 42)). This model is included in the generic model in software engineering and was first introduced by Winston Royce around 1970 so it is often considered obsolete, but it is the most widely used model in Software Engineering (SE).

Information System is a system within an organization that meets the needs of daily transaction management, supports operations, is managerial and strategic activities of an organization and provides certain outsiders with the necessary reports. (Atmoko & Arizona, 2016)



The system is a collection of elements that are interrelated and work together to process the input (input) addressed to the system and process these inputs to produce the desired outputs. A good system must have the right goals and objectives because this will be very decisive in defining the input needed by the system and the resulting output. (Samsudin, 2018)

The definition of a web-based learning model in terminology, the web or website is a collection of web pages and documents that are spread on several computer servers that are located all over the world and are connected to one network through a network called the internet. (Hamdan Husein Batubara, 2018)

The definition of a system is a collection of people who cooperate with each other the provisions of systematic and structured rules to form a unit that carries out a function to achieve goals. The system has several characteristics or characteristics consisting of system components, system boundaries, the environment outside the system, the system interface, system input, system output, system processing, and system goals. (Elisabet Yunaeti Anggraeni and Rita Irviani, 2017: 1)

The internet or international networking is defined as two or more computers that have connectivity forming computer networks to include millions of computers in the world globally (internationally), who interact with and exchange information. (Dr. Rusman, M.Pd. (2017)

Website can be interpreted as a collection of pages that are used to publish information in the form of text, images, and other multimedia programs in the form of animation (motion pictures, motion writing), sound, and funds or a combination of all of them both good static or dynamic that form a series of buildings that are interrelated between one page with another page which is often referred to as a hyperlink. In another sense that a website is a collection of pages that are usually summarized in a domain or subdomain, which is located on the World Wide Web (WWW) on the internet. A web page is a document written in HTML (HyperText Markup Language) format, which is almost always accessible via HTTP, a protocol that conveys information from a website server to be displayed to users through a web browser. All of these website publications can form a very large information network. Fitri Mariska (2016: 1)

Defines that the Web is a graphical information service on the internet and allows anyone to be 24 hours/day on the internet. (Samsudin, 2018)

Explaining that the understanding of a web server is a Web Server refers to hardware (server) and software that provides access services to users through HTTP or variant communication protocols (such as FTP and HTTPS) over the files contained in a URL to the user. Fathansyah in (Prayitno & Safitri, 2015)

The definition of a database (database) is a base (base) and data (data). Mention that data is facts about everything in the real world that can be recorded and stored on computer media and data is a description of objects and events that have meaning and importance in the user environment. According to the Big Indonesian Dictionary (KBBI), the basis is principle, basis, association, rank, collection. (Subandi and Aulia Akharian, 2018)

A good information system is an information system that can be easily developed in accordance with the conditions and development in which the information system is applied, the waterfall model is the most widely used model for the development stage. (Pangestu et al., 2018)

ERD has two main components, namely Entity (Entity) and Relations (Relations). These two components, each equipped with a number of attributes that present all the facts that exist in the real world.

This ERD can be described systematically using symbols as shown in the table. (Iswandy, 2015). ERD design is an initial concept of making a database, to be used or translated into the query language, the ERD diagram must be transformed into a Logical Record Structure (LRS) so that the specifications of the tables in the database can be designed as needed. (Sihombing, DO, et al. 2016)

Each entity will be changed to the form of a box, A relation attribute is united in a shared entity box if the relationship that occurs in the ER-diagram 1: M (relations united with cardinality M) or the level of relationship 1: 1 (relations united with cardinality that most need a reference), a relation is separated in a separate box (becomes a new entity) if the relationship level is M: M (many to many) and has a foreign key as the primary key taken from the two entities that were previously interconnected. (Puspitasari. 2016)

UML is a methodology in developing object-oriented systems and is also a tool to support system development (Hendini, A. 2016) . :

a) Activity Diagram

Describes a series of streams of activities, used to describe activities that are formed in operation so that they can also be used for other activities. Making activity diagrams at the beginning of modeling the process can help understand the whole process. Activity diagrams are also used to illustrate the interactions between several use cases.

b) Usecase Diagram

Use Case diagrams are used to illustrate the system from the user's point of view. so that the use of case use diagrams is more focused on the functionality that is on the system, not based on the flow or sequence of events. A use case diagram presents an interaction between actors and the system.

c) Class Diagram

Class is a specification that will produce objects and is the core of object-oriented development and design. The class describes the state (attribute or property) of a system while offering services to manipulate that state (method or function). The class has three main areas, namely:

- 1) Name (Class Name)
- 2) Attributes
- 3) Method (Operation)

d) Sequence Diagram

Describe interactions between a number of objects in chronological order. Its function is to show the sequence of messages sent between objects as well as interactions between objects that occur at a certain point in the system's execution.

This model approaches systematically and sequentially. Called the waterfall because step by step through must wait for the completion of the previous stage and run sequentially, including the following stages:

A. Analysis

At this stage, it is a process of analyzing system requirements. The developer collects data as material for system development. Data collection can be done by interviewing techniques, observation techniques, and questionnaire techniques.

B. Design

The design process is a multi-step process that focuses on four attributes, namely: data structure, software architecture, interface representation, and procedural details. The design process translates the results of the analysis into software representations.

C. Code

At this stage, the design is translated into a software program. At the implementation stage in the program, code will depend on the results of software design in the previous stage.

D. Test

After coding, proceed with testing of the system that has been made. Tests carried out to determine the suitability of the output results of the system with the needs that have been designed at the analysis stage.

Data collection techniques used by the author in collecting data as follows:

a) Direct observation (Observation)

The author makes direct observations of the processing process at the Metrology Management Unit, in order to obtain the necessary data and which relate directly to the theme in order to obtain complete and accurate data.

b) Interview

The author also collected data through interviews with a question and answer process to Pa. Zikri Arif, ST The window coordinator, in order to get more efficient information.

c) Library Studies (Library Research)

In addition to observation, the authors also use data obtained directly from various sources, such as reference books and internet sources that can be used as a reference or illustration in preparing reports.

Stages of the current system process in Jakarta Metrology are:

- 1) Customers register
- 2) After registering the customer makes a payment at the counter if yes the process continues if the item is not brought back
- 3) The counter window registers the customer
- 4) Customers receive proof of registration and bring the items to be tested to the test site
- 5) Customers submit proof of registration
- 6) Installation admin receives proof of registration and goods
- 7) After that, the customer is given proof of receipt of goods by the installation admin
- 8) Goods are tested if good goods the process continues if not then the goods do not pass the test (repair the goods)
- 9) After being tested the installation admin makes the tool report data and submit the data to admin bo
- 10) Admin bo receive the data



- 11) Admin bo prints certificates
- 12) Admin bo provide certificates to the admin window
- 13) After all, processes are complete the customer can take the certificate to the window

Activity Diagram of the Running System

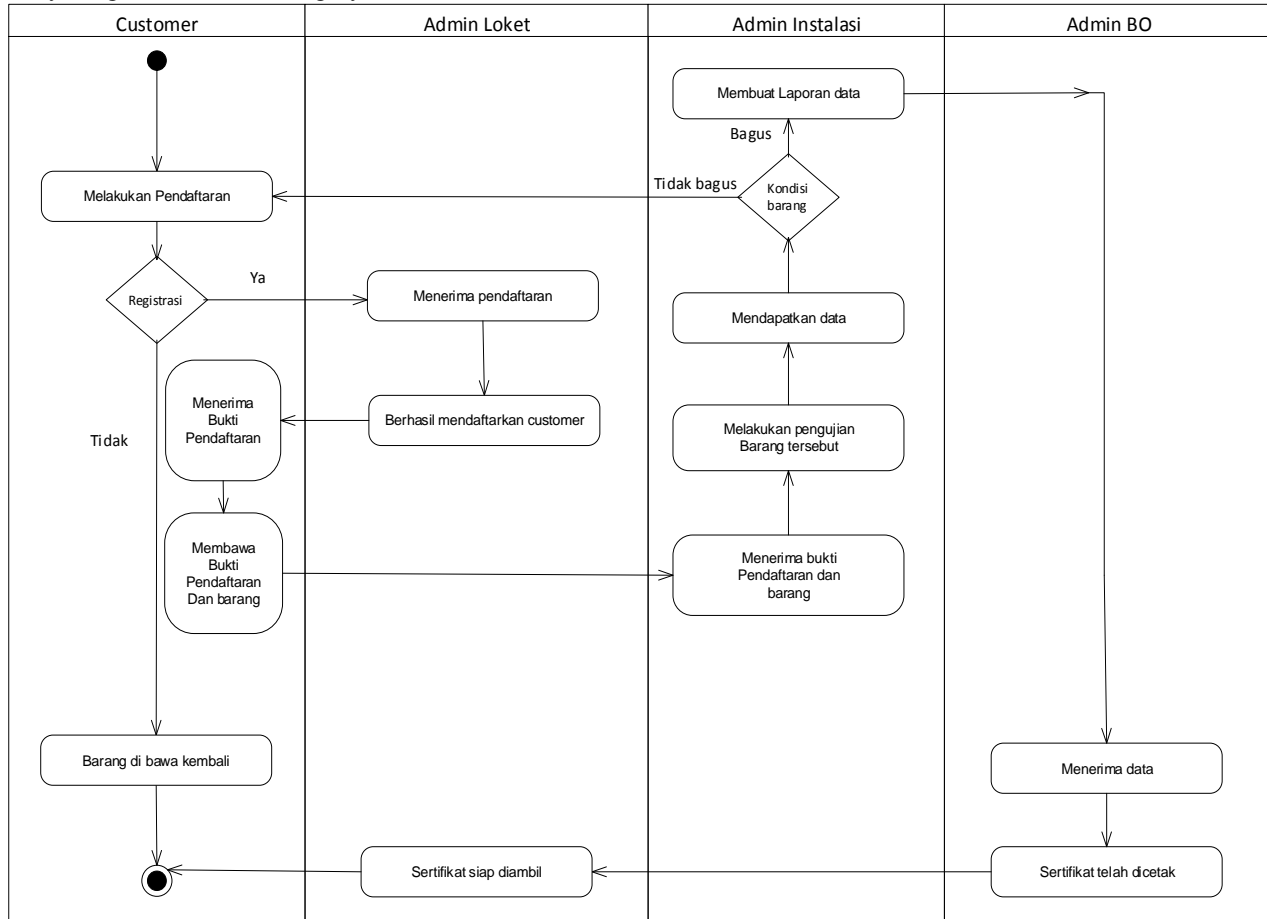


Fig 1 Activity diagram of the system running
Source: Metrology Management Unit

3. Results

3.1. Operating System Document Specifications

A. Input Document Specifications

Forms of input documents are forms of documents entered or received to carry out the process. Below is a description of the forms of input documents that exist in the system:

- 1) Document Name : Registration form
Function : To register
Source : Admin window
Destination : Customer
Media : Paper
Amount : 1 sheet
Frequency : Every customer sign up
Form : Appendix A1
- 2) Document Name : Report on test results
Fungs : Goods test results
Source : Installation Admin
Destination : Admin Bo
Media : Paper
Amount : 1 sheet
Frequency : Test results of goods the



Form : Appendix A2

B. Output Document Specifications

Below this is a description of the output documents that exist in the system:

- 1) Document Name : Certificate
 Function : Result of authentication goods
 Source : Admin window
 Destination : Customer
 Media : Paper
 Amount : 1 sheet
 Frequency : Every customer Take a certificate
 Form : Appendix B1
- 2) Document Name: Receipt
 Fungs : Handover receipt goods
 Source : Admin window
 Destination : Customer
 Media : Paper
 Amount : 1 sheet
 Frequency : Every customer carry goods
 Form : Appendix B2

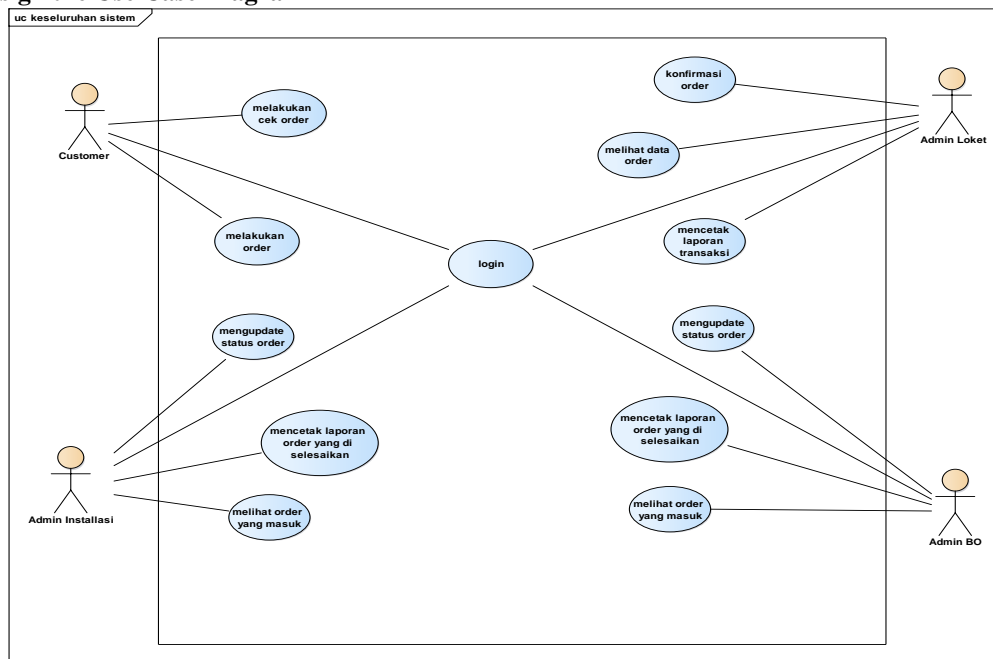
3.2. System Design Stages

A. Requirements Analysis

After doing research several system requirements are needed on the website that will be developed, namely:

- 1) Visitor Needs
 - a) Registering orders
 - b) Check the status of the order
- 2) Admin Requirement
 - a) Log in as an admin
 - b) Receiving orders
 - c) Update the status of the order being worked on
 - d) Print every transaction report every day
- 3) System requirements
 - a) Admin must login first to be able to process orders
 - b) Admin must log out to maintain security

3.3. Design the Use Case Diagram



Source: Research Results (2020)

Fig 2 Use Case Proposed System

Table 1
Description of Use Case Login

Use Case Name	Login
<i>Requirement</i>	Have a valid email and password
<i>Goal</i>	For security so that not everyone can access
<i>Pre-Condition</i>	Enter the login data
<i>Post-Condition</i>	The system redirects to the admin page
<i>Failed end Condition</i>	The system notifies an invalid login account
<i>Actors</i>	Admin
<i>Main Flow / Basic Path</i>	1. Admin visits the login page 2. Admin fills in the login form 3. Click the login button 4. The system displays the admin page
<i>ternate Flow / Invariant A</i>	A1. The system displays an incorrect username or password notification
<i>Invariant B</i>	B1. Admin visits the login page B2. Admin fills in the login form B3. Click the login button B4. The system displays the require column field notification

Source: Research Results (2020)

Table 2
Description of Use Case Place an Order

Use Case Name	Place an Order
<i>Requirement</i>	Login as a customer
<i>Goal</i>	Process and save orders
<i>Pre-Condition</i>	Enter the input order page
<i>Post-Condition</i>	Displays list order
<i>Failed end Condition</i>	-
<i>Actors</i>	Customer
<i>Main Flow / Basic Path</i>	1. Admin log in as admin window 2. Admin chooses the registration menu 3. Admin input data order 4. Click the register button 5. The system displays the order list page
<i>Alternate Flow / Invariant A</i>	-
<i>Invariant B</i>	B1. Admin log in as admin window B2. Admin choose the registration menu B3. Admin input data orders B4. Click the register button B5. The system displays the require column field notification

Source: Research Results (2020)

Table 3
Use Case Description Prints the completed order report

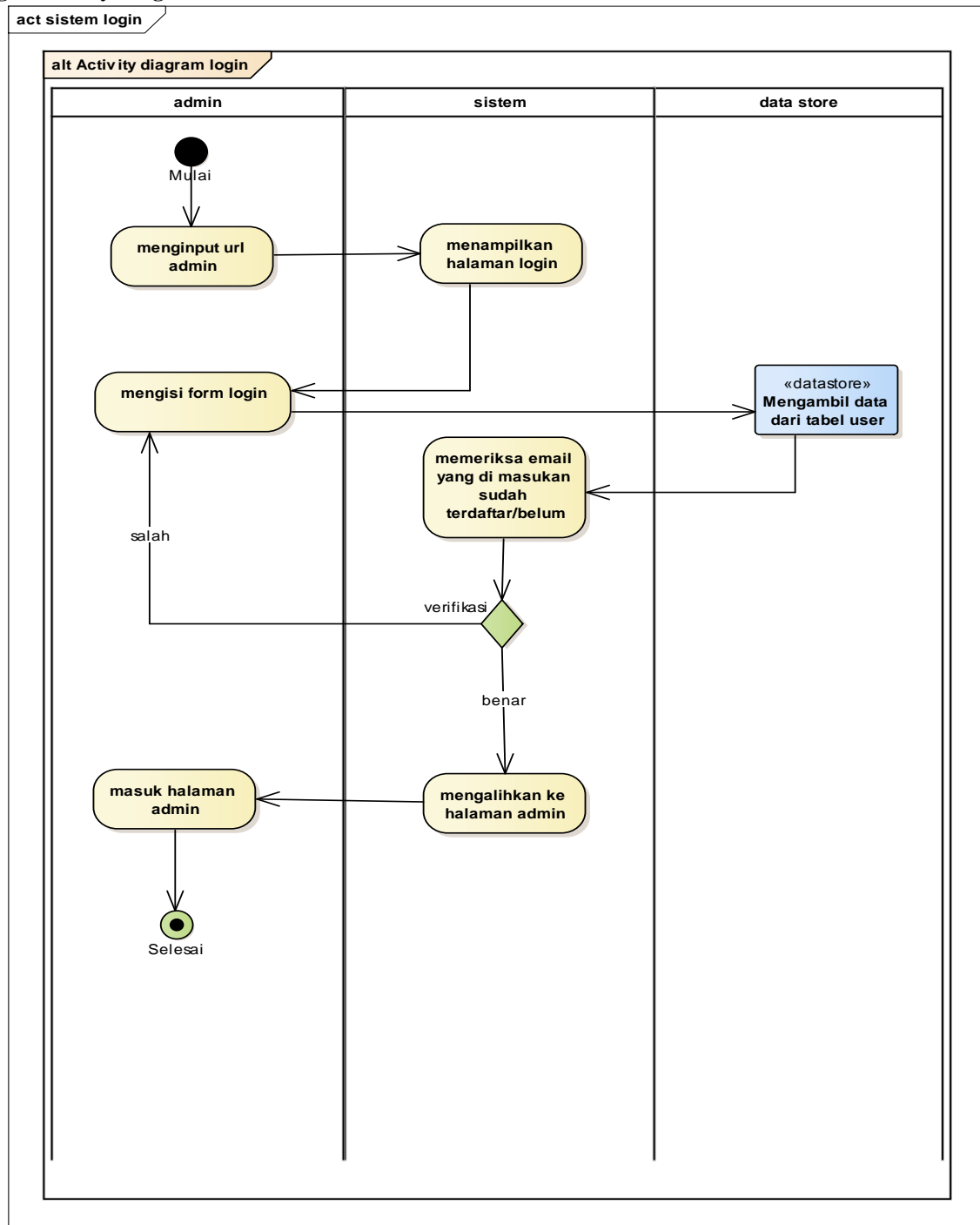
Use Case Name	Prints the completed order report
<i>Requirement</i>	Login as admin
<i>Goal</i>	Recap data of transaction reports or incoming orders
<i>Pre-Condition</i>	Select the page you want to print
<i>Post-Condition</i>	Displays the page to be printed
<i>Failed end Condition</i>	-
<i>Actors</i>	Admin
<i>Main Flow / Basic Path</i>	1. Login as admin 2. Select the print menu 3. Print configuration 4. Click the print button 5. The system performs the print process
<i>Alternate Flow / Invariant A</i>	-
<i>Invariant B</i>	-

Source: Research Results (2020)



3.4. Design the Activity Diagram

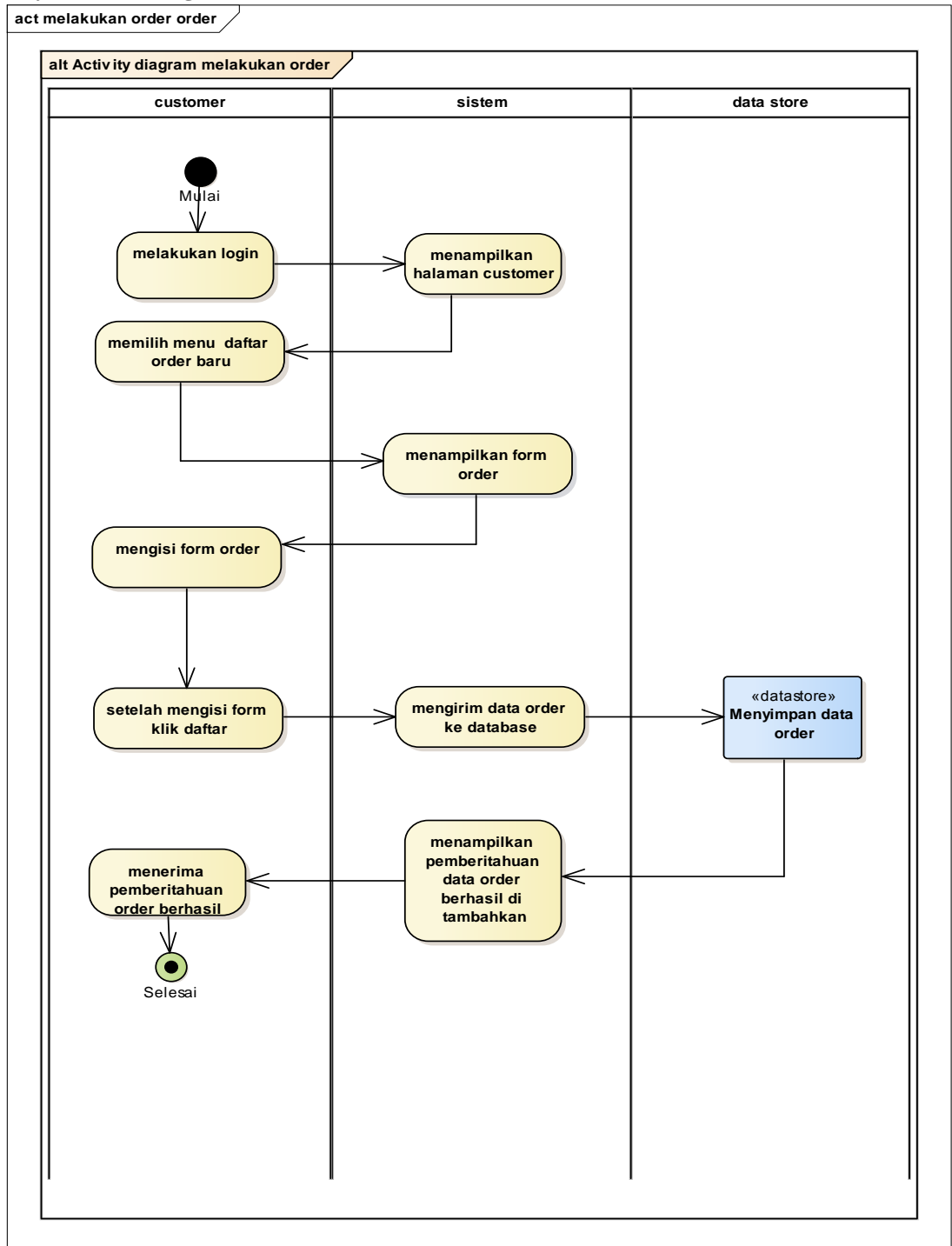
A. Login Activity Diagram



Source: Research Results (2020)

Fig 3 Login Activity Chart

B. Activity Chart Making an Order



Source: Research Results (2020)

Fig 4 Activity Chart Making an Order

3.5. Proposed System Document Design

For transaction and report making, the documents that will be needed will be designed, the following is the draft input and output documents that have been made:

- 1) Form the order registration form
 Function : To make an order
 Source : Registration page

- Destination : Admin
- Media : Monitor
- Amount : Not in the limit
- Frequency : Every time a customer makes an order
- Form : See Appendix C.1
- 2) Loker Transaction Data Report
 - Function : To recap the order data at the counter daily
 - Source : Admin Counters
 - Purpose : Director
 - Media : Paper
 - Amount : Not in the limit
 - Frequency : Each ticket window wants to recap transaction data at the window
 - Form : See Appendix D.1
- 3) Installation Transaction Data Report
 - Function : To record order data in the installation admin
 - Source : Installation Admin
 - Purpose : Director
 - Media : Paper
 - Amount : Not in the limit
 - Frequency: Every time you want to record order in the installation admin
 - Form : See Appendix D.2
- 4) BO Transaction Data Report
 - Function : To record order data in BO admin
 - Source : Admin BO
 - Purpose : Director
 - Media : Paper
 - Amount : Not in the limit
 - Frequency : Every time you want to record order in the BO admin
 - Form : See Appendix D.3

3.6 Prototype Design

A. Admin page



Sumber : Hasil Penelitian (2020)

Fig 5 Admin page

B. Admin Login Page

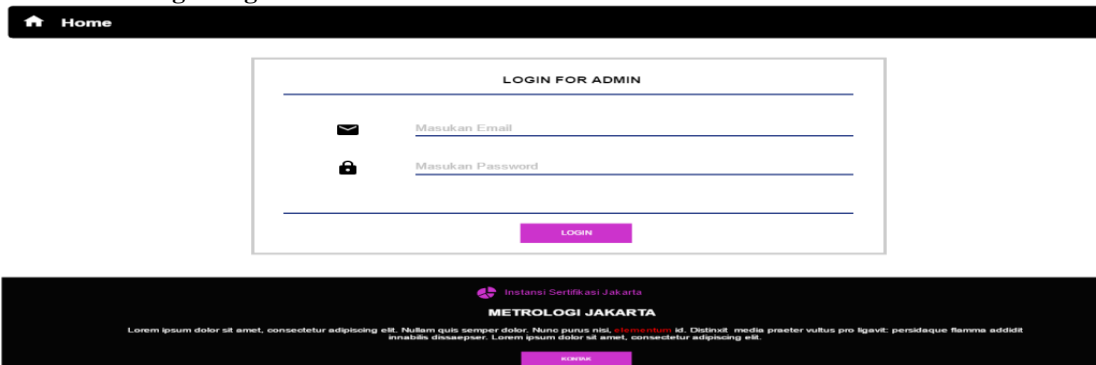


Fig 6. Admin Login Page

3.7 Software Design

A. Entity Relationship Diagram (ERD)

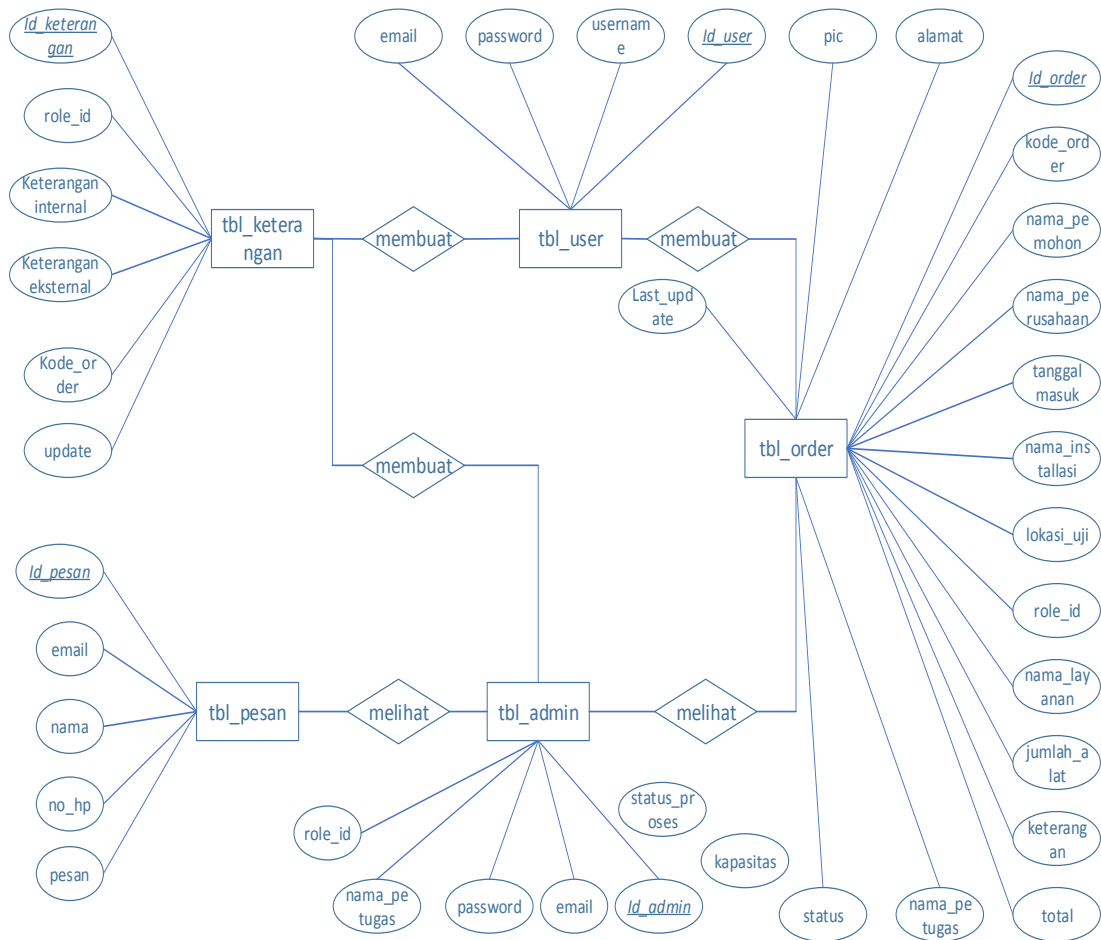


Fig 7 Entity Relationship Diagram

3.8 Logical Record Structure (LRS)

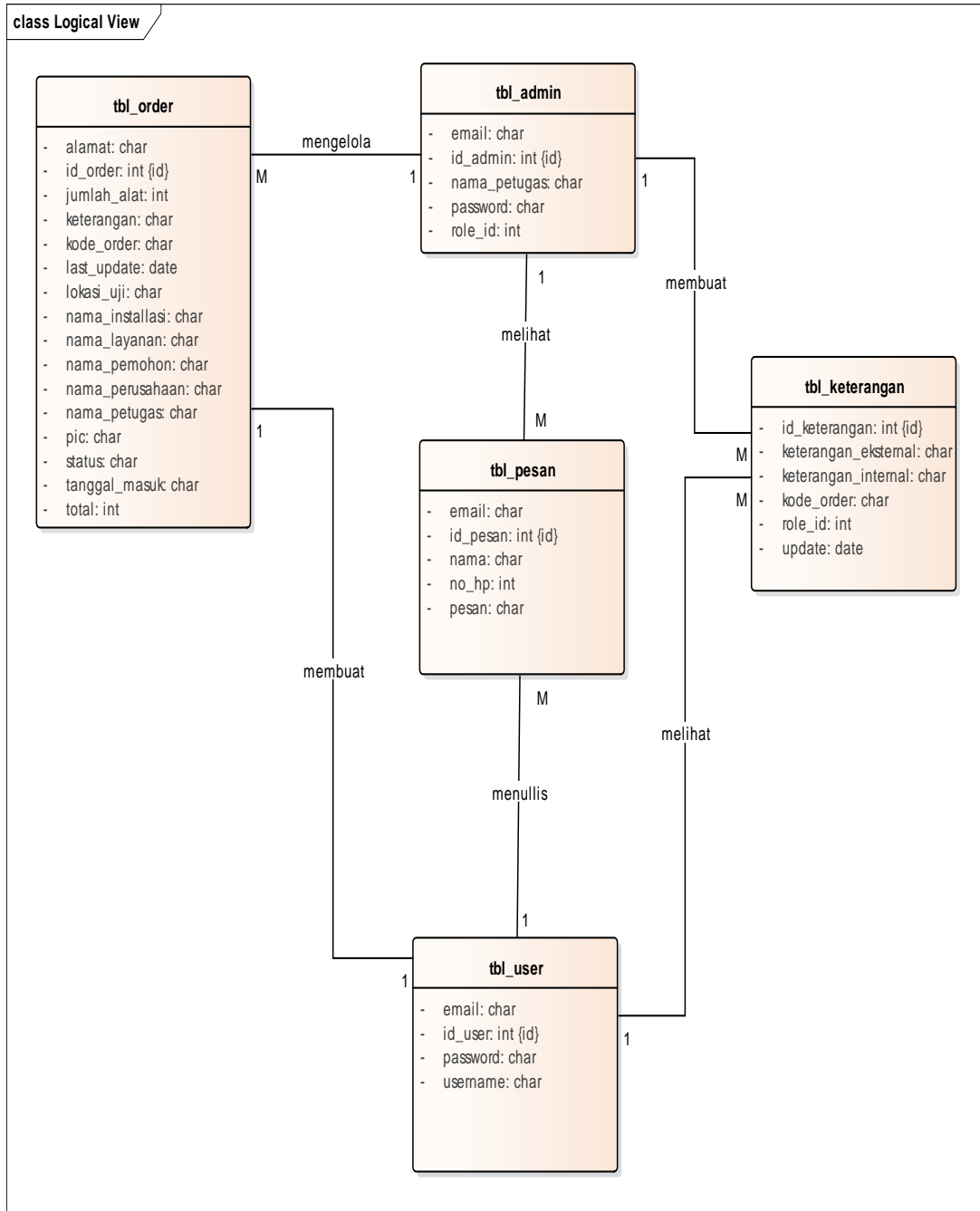


Fig 8 Logical Record Structure

3.9 Class Model / Class Diagram

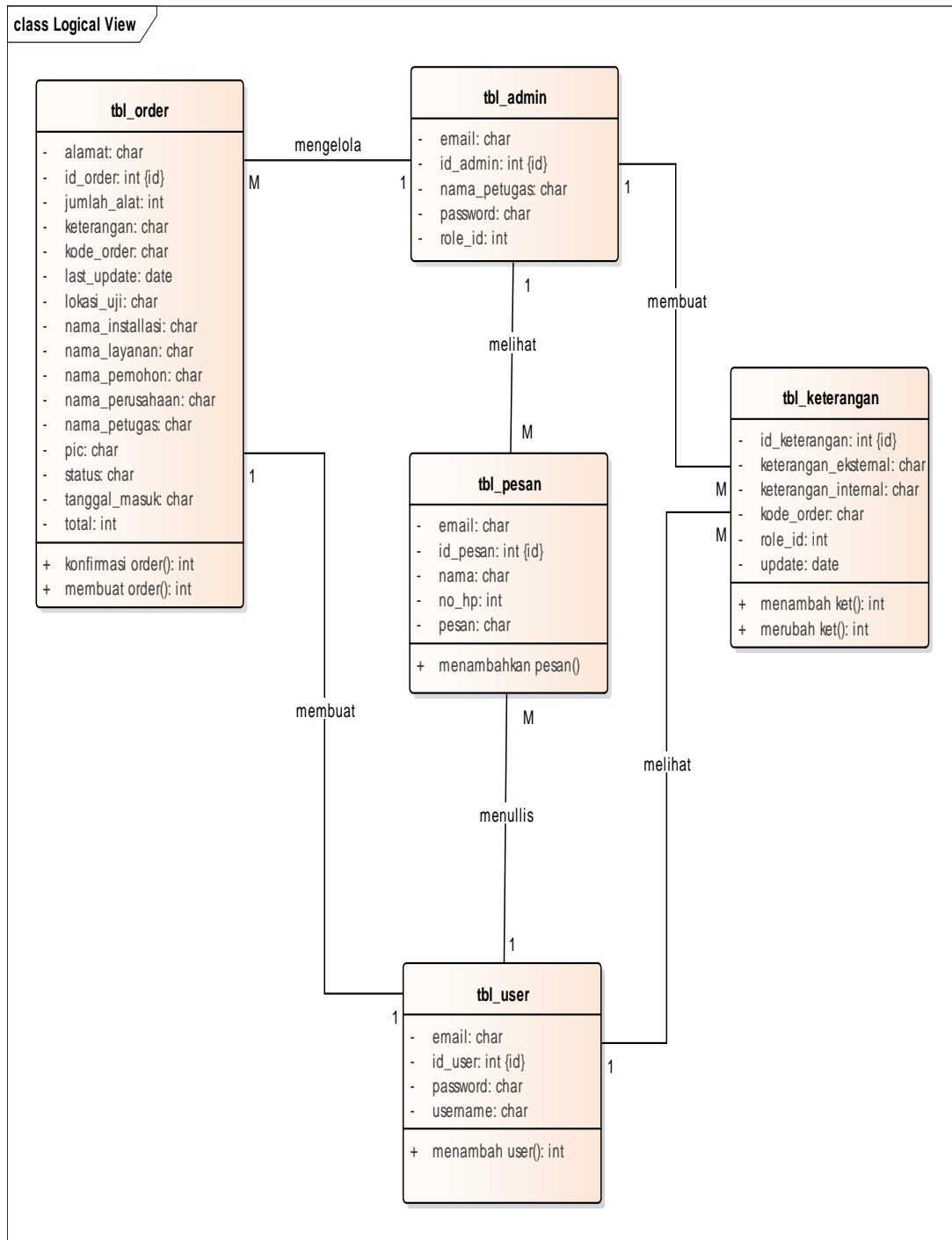


Fig 9. Class Model / Class Diagram

4. Conclusion

At this time the online service system has been very popular because it can provide convenience to the public in conducting transactions, after making the final assignment, the following conclusions can be obtained:

- a) The Jakarta Metrology Management Unit service in completing work is still manual, both receipt of goods, recording/registration, to the archiving that has an important role in an office, if the records are

poorly managed, it can be difficult to find the data that has been stored and finally can inhibit the next stage of the work process

- b) In the design of a system must be considered every system that will be needed on the website that will be made because of the previous system in the company is still too complicated.
- c) The system made must pay attention to the convenience of customers and give the impression of a good experience to website users so that customers are no longer in the future.
- d) In compiling the diagram must be made as simple as possible so that it is easy to understand so that when making the website it can be easily applied to the web when coding and compiling the database.

5. References

- [1] Anggraeni, E. Y., & Irviani, R. (2017). *Pengantar Sistem Informasi*. Yogyakarta: CV. ANDI OFFSET.
- [2] Atmoko, Y. D., & Arizona, N. D. (2016). Aplikasi Penjualan dan Pembelian Secara Tunai dan Non Tunai Pada PD Istana Gypsum Pontianak. *Simposium Nasional Ilmu Pengetahuan Dan Teknologi (SIMNASIPTEK)*, 38–44. Retrieved from <http://seminar.bsi.ac.id/simnasipstek/index.php/simnasipstek-2016/article/view/86/86>
- [3] Batubara, H. H. (2018). *Pembelajaran Berbasis Web Dengan Moodle Versi 3.4*. Sleman: CV. BUDI UTAMA.
- [4] Iswandy, E. (2015). Sistem Penunjang Keputusan Untuk Menentukan Penerimaan Dana Santunan Sosial Anak Nagari Dan Penyalurannya Bagi Mahasiswa dan Pelajar Kurang Mampu di Kenagarian Barung - Barung Belantai Timur. *Teknoif*, 3(2), 70–79. <https://doi.org/2338-2724>
- [5] Marisa, F. (2017). *Web Programing (Client Side And Server Side)*. Sleman: CV. BUDI UTAMA.
- [6] Rusman. (2017). *Belajar dan Pembelajaran Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana.
- [7] Samsudin, A. (2018). SATIN – Sains dan Teknologi Informasi Rancang Bangun Aplikasi On
- [8] Subandi, & Syahidi, A. A. (2018). *Basis Data Teori dan Praktik Menggunakan Microsoft Office*. Sleman: POLIBAN PRESS.
- [9] Pangestu, H. R., Studi, P., Informatika, T., Latifah, F., Studi, P., & Akuntansi, K. (2018). *Karyawan Dengan Metode Waterfall Berbasis Web Pada Pt. Mero Sekawan*. 4(2), 13–18.
- [10] Prayitno, A., & Safitri, Y. (2015). Pemanfaatan Sistem Informasi Perpustakaan Digital Berbasis Website Untuk Para Penulis. *IJSE – Indonesian Journal on Software Engineering*, 1(1), 1–10. <https://doi.org/10.4028/www.scientific.net/AMR.756-759.138>

