Research Paper

Design of the Si-PDKT Application for the Memorandum-in Validation Process When Inspection of Ship Documents

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Abstract

Arriving Vessel Document Inspection System (Si-PDKT) is a web-based application that is implemented by utilizing information technology as a supporting tool for optimizing memorandum services in the process of inspecting arriving ship documents at the Class II Cirebon Harbormaster and Port Authority Office. The purpose of developing the Si-PDKT application that will be implemented in KSOP Class II Cirebon Section Legal Status and Ship Certification is more efficient management of ship data, digitally stored ship documents, avoiding document loss, facilitating the management of ship transactions, conducting validation and verification quickly. The method used is development research. In development research, a system design is carried out which is carried out in several stages based on an analysis of the needs of the system to be used. The stages are divided into three main stages, namely infrastructure requirements, system creation, and application usage. The research results show that the Si-PDKT that was built can be accessed at the address https://sipdkt.ksopcirebon.id. The stages of using Si-PDKT are (1) creating an account via email; (2) the user uploading the company decree; (3) After being verified, the user changes the profile; (4) on the company data menu, the user can choose the company where it works; (5) on the ship data menu, the user can add ships; (6) on the menu data memo-in contains the ship's data along with the documents and the memo-in (7.) If it has been filled in, a memo-in history will appear. At the end of verification from the operator, a verification status will appear where there is a color change following the verification status, and if you click on verification, the verification history will appear. If it has been verified as final, then the Memo In document can be downloaded.

Keywords *Web Application, KSOP Cirebon, Si-PDKT*

INTRODUCTION

The sea transportation sector in the Resolution 4.0 era is faced with digitalization systems, including the shipping industry's competitiveness and renewal of technology applications in the shipping sector (Pratama & Iryanti, 2020), such as the use of inaportnet (Maulita & Rahmat, 2022), My JICT (Dewi & Fakhrurrozi, 2021) which has been used as a demand for a management digitalization system at ports. Globally, the Indonesian sea transportation sector must also respond to Blockchain Technology and Smart Port (Ricardianto et al., 2020) in realizing the Indonesian government's program regarding sea highways, which demands increased human resources (Utami, 2021). This is based on the fact that sea transportation has a very important role in Indonesia as the largest archipelagic country in the world, with sea territory approaching 80% with 3 million territories in Indonesia which are included in the Exclusive Economic Zone (Pudjiastuti, 2014; Coordinating Ministry for Maritime Affairs of the Republic of Indonesia, 2017).

Sea transportation helps sustain life and improves the economy of the Indonesian people (Rumaji & Adiliya, 2019), which can reduce logistics costs (Fahmiasari, 2016b; Fahmiasari, 2016a). Sea transportation activities are driven by shipping companies or shipping agencies that support port operations. As a result of the 4.0 revolution, there is an urgency to empower technological advances in several service processes. So, for KSOP, it is necessary to improve services assisted by

digital systems, including the development of the Arrival Ship Document Inspection System (Si-PDKT). In examining arriving ship documents at the Kesyahbandaran and Port Authority Office (KSOP), this authority is given to the Legal Status and ship certification section (Regulation of the Minister of Transportation Number 36 of 2012 in Hidayatullah, 2013). For KSOP Class II Cirebon (Darsono et al., 2021) is carried out manually in various parts of the relevant section to check the completeness of the ship's certificate file (Fatah et al., 2019). When the COVID-19 pandemic came, and service activities were not carried out optimally (Arianto & Sutrisno, 2021), problems occurred because no information system supported online memorandum inspection services in a structured manner. Hence, the service process became hampered and difficult to monitor and document by KSOP Class II Cirebon.

LITERATURE REVIEW

Si-PDKT is an acronym for Arriving Ship Document Inspection System, a web-based application implemented by utilizing information technology as a supporting tool for optimizing memorandum-in services in inspecting ship documents at the KSOP Class Office. This system is created with a certain algorithm to analyze the required documents. The recapitulation of inspection results is based, among other things, on inputting the name of the ship, type of ship, ship tonnage, ship dimensions, ship cargo, and shipping area so that the system can display documents that must be owned by each particular ship and can be immediately presented by the system according to the desired time interval, the inspection results will be stored digitally, and the data can be downloaded at any time when needed by interested parties development of the Si-PDKT application which will be implemented in KSOP Class II Cirebon Section Legal Status and Ship Certification where if this system is implemented several indicators of success will be obtained namely 1. Management of ship data is more efficient; 2. Vessel documents are stored digitally; 3. Avoid losing documents; 4. Facilitate the management of ship transactions; 5. Perform validation and verification quickly.

In carrying out its duties, the Class II Cirebon KSOP Authority and Harbormaster Office has the following functions (Kemenhub, n. d.):

1. Implementation of supervision and compliance with ship seaworthiness, certification of ship safety, prevention of pollution from ships, and determination of the legal status of ships;
2. Execution of ship safety management inspection;
3. Implementation of shipping safety and security supervision related to loading and unloading of dangerous goods, special goods, hazardous and toxic waste (B3), refueling, the orderliness of port facilities, dredging and reclamation, seaworthiness and seaworthiness, orderly ship traffic in port waters and shipping lanes, guiding and tugging ships, as well as the issuance of Sailing Approval Letters;
4. Carrying out investigations into ship accidents, prevention and suppression of fires in port waters, handling of disasters at sea, implementation of maritime environmental protection and law enforcement in the field of shipping safety and security;
5. Implementation of coordination of government activities at ports related to the implementation of supervision and law enforcement in the field of shipping safety and security;
6. Implementation of the preparation of Port Master Plans, Work Environment Areas, and Port Interest Environment Areas, as well as supervision of their use, proposing tariffs to be determined by the Minister;
7. Implementation of the provision, regulation, and supervision of the use of land and harbor waters, maintenance of wave breakers, port pools, shipping lanes, and road networks, as well as Navigational Auxiliary Facilities;

8. Implementation of guarantees and maintenance of environmental safety at ports, security and order, and smooth flow of goods at ports;
9. Implementation of regulation of ship traffic in and out of the port through ship pilotage, provision and/or shipping of other forms of services to Port Business Entities;
10. Preparation of material for determination and evaluation of operational performance standards for shipping port services and
11. Implementation of financial affairs, personnel and general, legal and public relations and reporting.

KSOP Class II Cirebon has the following roles:
1. As a node in the sea transportation network, the port of Cirebon acts as a collector port according to the hierarchy.
2. As a gateway for economic activities in the city of Cirebon.
3. As a place for the transfer of modes of transportation in trade between islands and between countries.
4. To support industrial and/or trading activities.
5. As a place for distribution, production and consolidation of cargo/goods from and to the port of Cirebon.
6. In order to realize the insight of the archipelago and the sovereignty of the Republic of Indonesia.

Information system (IS), in general, is a system that combines human activities and the use of technology to support management and operational activities. It refers to a relationship created based on the interaction of humans, data, information, technology, and algorithms. The Information System plan that will be created and developed is the Arrival Ship Data Registration Information System (Si-PDKT), which functions to check the document memorandum of ships that will arrive at the Port of Cirebon.

Research on the inspection of ship documents at KSOP has been carried out by several studies shown in Table 1.

Table 1 . Previous research

No	Writer	Title, results, and constraints
1.	Nurul Fadillah Novistia, Kamaruddin Tone, , Faisal Rahman. (Novistia, Tone and Rahman, 2016)	*Desktop-based ship inspection system in the field of sailing safety for the main Kesyahbandaran office*. The results of the study state that the Desktop application can help as a medium for interaction and information between KSOP employees and agents. However, there are deficiencies in the system where respondents said there was no online access service for agents.
2.	Yesi Wulandari, Yusron Bastian, Yosi Mulyana Pratiwi. (Wulandari, Bastian and Pratiwi, 2020)	*Vessel Document Examination Procedures at the Waingpu Port Authority and Harbormaster Office* From the research, it was found that (a) Every ship that will enter the port of Waingapu will go through a document inspection process during the ship document inspection activities; some problems occur during the inspection of ship documents which cause delays in the *clearance out*

process. The inspection is still done manually, not using the system/application.

RESEARCH METHOD

The method in this study uses development research (Sugiyono, 2013). In development research, the design and development of Si-PDKT is carried out, which is composed of several stages, namely:

1. Selection of infrastructure components

As shown in Table 2, infrastructure components are needed to create and develop the Information System.

Table 2. Hardware and Software infrastructure components

No	Hardware	Software
1	Dell PowerEdge T40 servers a. Xeon E2224G b. RAM DDR4 16GB c. SAS 1Tb	OSUbuntu Server 20.04 LTS

2. Information System Building Design

In designing this information system, we plan to create an information system using the PHP language with the Code Igniter 4 Framework and a MySQL Database that is maximized using Bootstrap 4. As for the flow chart on the development of Si-PDKT. The SI-PDKT development has a more complex database, with additional Port and Company tables that are separate from the user. This is intended so that data recording to the system can be faster and faster feedback to the user.
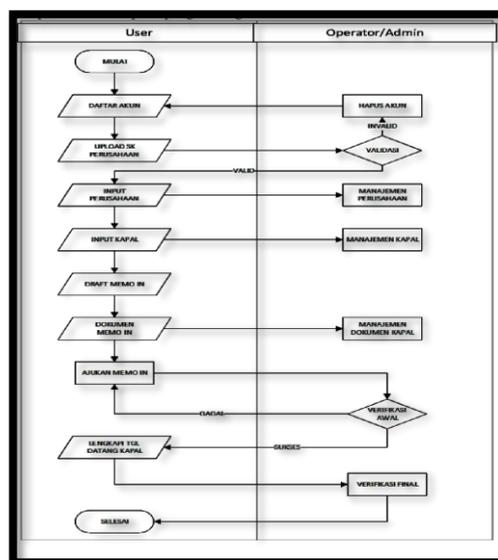

Figure 1. Si-PDKT development flowchart

FINDINGS AND DISCUSSION

The results of the development of Si-PDKT are divided into several stages of IT Infrastructure development and design with the following stages:

1. Making Information Systems
   a. Context Diagram
      System design begins with creating a context diagram (in Figure 2), which explains, in

general, the process of the information system to be created. The context diagram above explains that memo-in data processing at KSOP Cirebon has two entities, namely the Admin and Agent sections. Memo-in data processing begins or has input from the agent entity, namely in the form of data requirements the ship agent must complete to obtain a memo-in.
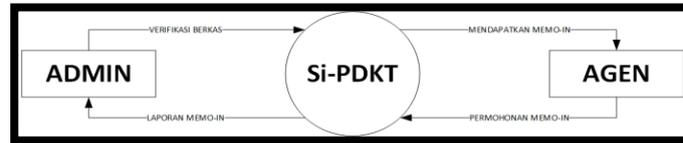

Figure 2. Context diagrams

Source: Researcher

b. Data Flow Diagrams (DFD Level 0)

At DFD level 0, the development of Si-PDKT has three processes, namely: login admin, operator and agent, process input requirements, and output in the form of a memo-in. The diagram can be seen in Figure 3.
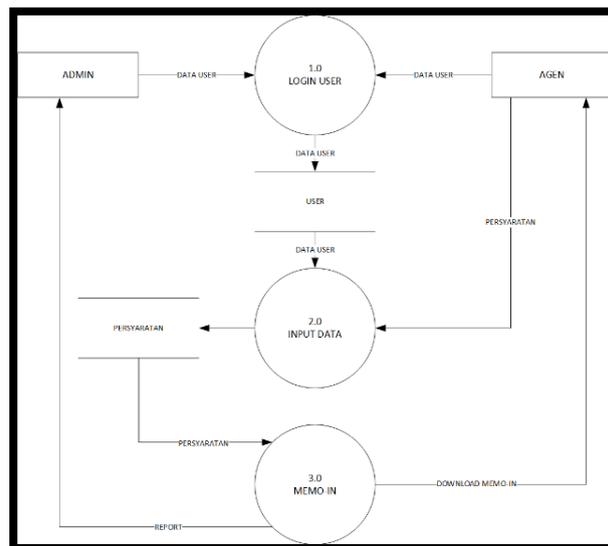

Figure 3. Level 0 chart

Based on the level 0 diagram above, it can be explained as follows:
1. Process 1.0 Login Admin: Admin login
2. Process 1.0 Agent Registration and Login: To be able to enter the dashboard, agents must register first.
3. Process 2.0 Data Input: This is a data input process in the form of transaction data, ship data, and document upload data.
4. Process 3.0 Memo-in: This is a report on the results of admin verification of the requirements that the agent has input. If it passes the verification, the agent will get a Memo-in.
c. Operating System Installation

The operating system (OS) used to deploy Si-PDKT is Linux Ubuntu Server 20.04 LTS.

Several things make us choose Linux, especially Ubuntu, to be used as a server, including:
1. It is a Freeware Operating System
2. Scheduled Security Updates
3. Easy to use
4. Reliable firewall
5. Lightweight and does not require a large memory
6. Compatible with several Web servers, such as LAMP and LNMP

2. Network Configuration and DNS

For network configuration, the first thing to do is embed the Public IP into the Mikrotik RB951G-2HnD Router via the SSTP-Client Tunnel and direct the Public IP to the Private IP via the NAT Firewall. After setting the Public IP and being directed to the Private IP, the next step is setting the IP and DNS as needed on the Server.

a. Control Panel Installation and Configuration (AAPanel)
    How to install aaPanel on the Server can be seen as follows:
    1. Please access the server, then type the following command:
        wget -O install.sh http://www.aaapanel.com/script/install-ubuntu_6.0_en.sh && sudo bash install.sh
    2. Next a dialog will appear as shown below, please type 'y' to continue the installation process.
    3. A display will appear below if the installation process is complete and successful. We will be given a URL, username, and password to login to the panel to manage the server.

b. Web Server Installation and Optimization (LNMP)
    After installing AAPanel, the next step is to install the webserver. The steps are as follows:
    1. Please login to aaPanel using the URL, username, and password provided during installation. Below is the aaPanel login display (Figure 4.)
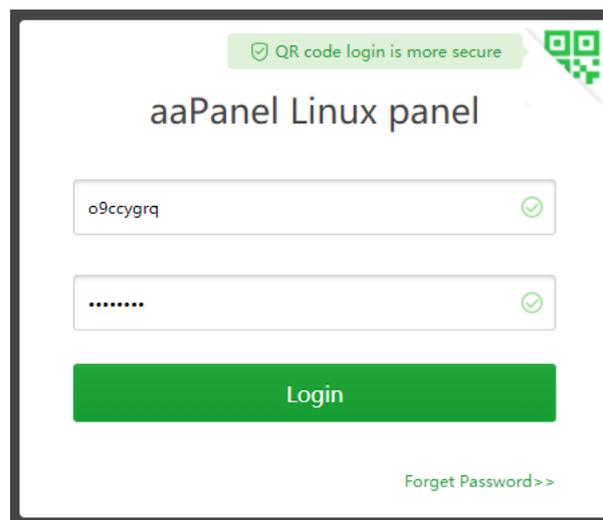

Figure 4. aaPanel login view

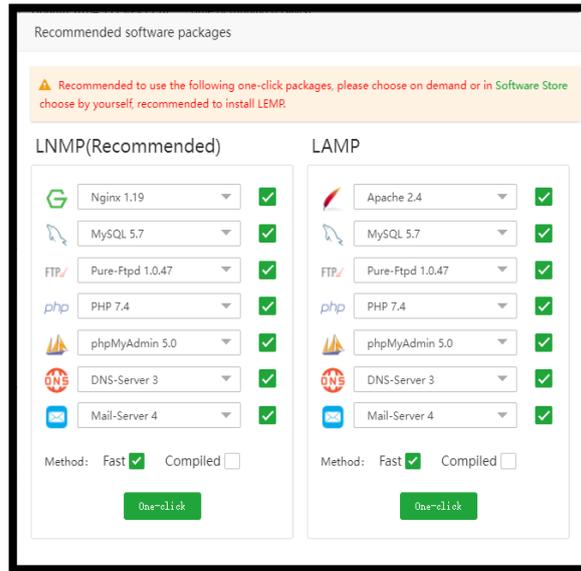Source: Researcher

2. After login, choose LNMP (Figure 5)

Figure 5. LNMP logins

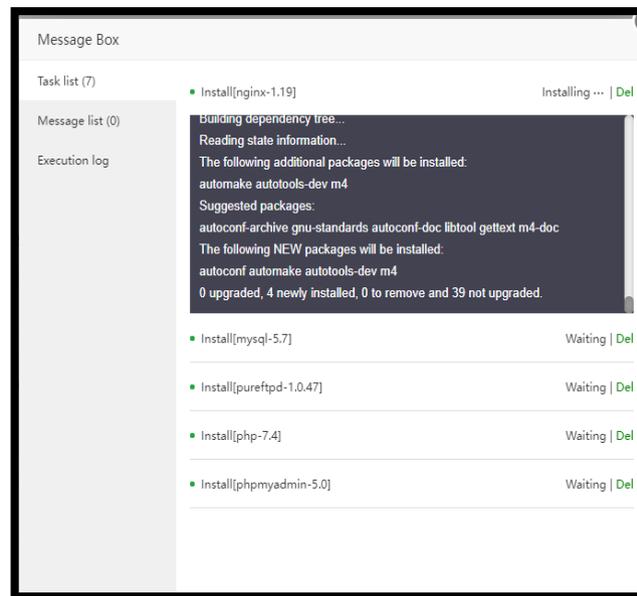Source: Researcher

3. Package installation (Figure 6).

Figure 6. Package installation

Source: Researcher

4. After the package is installed, the AAPanel dashboard page will appear (Figure 7).
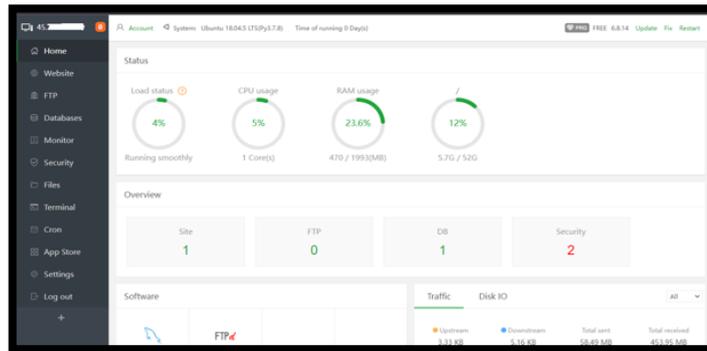

Figure 7. aaPanel Dashboard

Source: Researcher

The results of the Si-PDKT development are posted on the portal at the address: https://sipdkt.ksopcirebon.id. Si-PDKT 2.0 is the development of the Si-PDKT 1.0 application as a result of collaboration between the Kesyahbandaran Office and Class II Cirebon Port Authority and the Cirebon Maritime Suaka Bahari Academy, which the Directorate General of Vocational Education bridges through the Kedaireka Matching Fund Program (Humas Dikti, 2022; Kemenristekdikti, 2022).

Si-PDKT 2.0 is made using the PHP programming language with the latest CodeIgniter 4 Framework, making it more powerful and faster in data processing than the previous version. Si-PDKT 2.0 is also embedded with AdminLTE with Bootstrap, whose accessibility is no doubt.
So that it can be accessed multiplatform with very responsive.

Several stages of using Si-PDKT are:

1. Account List
   To register for a Si-PDKT account (in Figure 8), you can click the Register Account button when opening the Si-PDKT Application. The email contains validation information because the registration validation link will be emailed (Figure 9).
2. The user uploads the company decree
   After the account has been successfully activated, the dashboard display will be like this, the next step is to select My Profile Menu to edit the profile and upload the Company Decree (Figure 10).
3. After verified user changes profile.
   On the Edit Profile page (Figure 11), there are several action buttons, namely:
   a. Edit Profile (To change user personal data)
   b. Edit Password (To change password)
   c. Upload SK (To upload Company SK)
4. In the company data menu, the user can choose the company where he works,
5. On the ship data menu, the user can add ships,
6. The data memo in the menu contains the ship's data along with the documents and memos.
7. When it is filled, a memo-in history will appear.
   At the end of verification from the operator, a verification status will appear (Figure 12) where there is a color change following the verification status, and if you click on verification, the verification history will appear. If it has been verified as final, then the
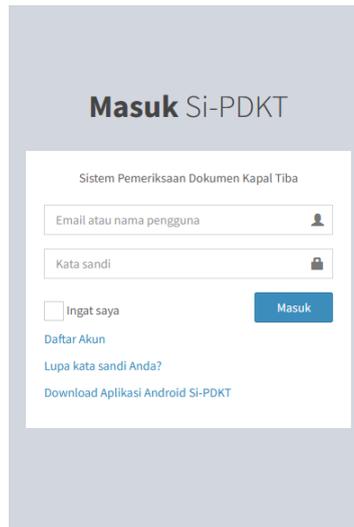
Memo In document can be downloaded.

Figure 8. Registration on the Si-PDKT account

Source: https://sipdkt.ksopcirebon.id

Figure 9. Verification via email

Source: https://sipdkt.ksopcirebon.id

Figure 10. User uploads the company decree

Source: https://sipdkt.ksopcirebon.id

Figure 11. User changes profile

Source: https://sipdkt.ksopcirebon.id

Figure 12. Memo In Verification History

Source: https://sipdkt.ksopcirebon.id

CONCLUSIONS

The study results show that the development of Si-PDKT can be accessed at https://sipdkt.ksopcirebon.id. The stages of using Si-PDKT are 1. creating an account via email, 2. the user uploads the company decree, 3. after being verified, the user changes the profile, 4. on the company data menu, the user can choose the company where he works, 5. on the ship data menu, the user can add ships, 6. on the menu data memo-in contains the ship's data along with the documents and the memo-in. 7. When it is filled in, a memo-in history will appear. At the end of verification from the operator, a verification status will appear where there is a color change following the verification status, and if you click on verification, the verification history will appear. If it has been verified as final, then the Memo In document can be downloaded.

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