



Development of SPS Inaportnet with Integration Web-Based Duty Officer Information at Tanjung Perak Surabaya Port

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Abstract

In the era of rapid digitalization, technology allows fast access to information via the internet. Digitalization of information systems is important to increase organizational efficiency. In the port sector, the Harbormaster's Office and the Tanjung Perak Surabaya First Class Port Authority have used Inaportnet to support shipping activities. One of the main services is the Sailing Approval Letter (SPB) which has been digitized in the Inaportnet SPS system. However, information dissemination by duty officers is still limited to WhatsApp groups and personal communications, causing inefficiencies. This research aims to evaluate the development and integration of an online guard officer information system using PHP. This research was carried out using the research and development method using a prototype model. Testing was carried out using the black box method with results showing a 100% functionality success rate. This integration produces additional features such as the main page, guard officer information dashboard, admin login and logout menus, as well as information notifications that can be used on all platforms. The research results show that this system increases operational effectiveness and efficiency at the Harbor Master of Tanjung Perak Surabaya. It is hoped that these findings can become a reference for the development of information systems in the maritime sector and increase understanding in data management.

Keywords: Sea Transportation, Duty Officer, Information Systems, SPS Inaportnet, Technology.

1. INTRODUCTION

In the era of rapid digitalization, technology allows fast access to information via the internet. Digitalization of information systems is important to increase organizational efficiency [1]. Information systems help organizations achieve goals by combining humans and computers to convert input into desired output [2].

In the port and maritime sector, the government can improve services through technology. The Harbormaster's Office and Tanjung Perak First Class Port Authority, Surabaya, have used Inaportnet, which facilitates various services to support shipping and port activities in Indonesia [3]. One of the main services is a Sailing Approval Letter (SPB) where the Harbormaster supervises ships that want to leave the port, ensuring that the ship, crew and cargo meets safety, security and marine environmental protection requirements [4].

SPB services have been digitized in the Inaportnet SPS system, which provides the harbormaster's approval online [5]. [6] Every ship that sails must have a Sailing Approval Letter issued by the Harbormaster. The harbormaster's approval, in this case the officer on duty at that time as a representative of the agency, plays a vital role in ensuring that activities at the port run according to procedures [7]. Watch officers have another term, namely watch service, watch officers are supervisory duties carried out both on ships and in ports with the aim of keeping the situation safe and under control for 24 hours, in order to safeguard the interests of staff and ensure safety and security in carrying out their duties [8].

However, currently, information dissemination by duty officers is still limited to WhatsApp groups and personal communications, causing inefficiencies and miscommunication. Therefore, a solution is needed that increases the efficiency of officer information management on duty and strengthens coordination at the port. Development website SPS Inaportnet with integrated guard officer information system online using PHP



becomes a relevant solution. This system will automate and centralize the management of guard officer information on one platform online, allowing access to duty officers' schedules and more efficient communication with all stakeholders. The integration of this system will increase transparency, accountability and coordination at the port. Duty officer information can be updated periodically real-time, helping to improve operational efficiency and maritime safety.

Therefore, the aim of this research is to evaluate the results of the development and integration of the guard officer information system online using PHP to improve the operations of the Tanjung Perak port, Surabaya. It is hoped that the benefits of this study can be a reference for readers who are interested and have an interest in developing information systems in the maritime world, as well as increasing understanding and knowledge in data management.

2. METHOD

This research was carried out at the Tanjung Perak Main Class Harbormaster and Port Authority Office, Surabaya. This research uses the method of research and development with model prototypes. This research focuses on development website SPS Inaportnet with online guard officer information system integration using the PHP programming language (Hypertext Preprocessor) with the Visual Studio Code editor tool. System design on a prototype Effective ones require in-depth analysis of user needs. Data analysis uses descriptive qualitative with the main focus being a good presentation to users to ensure an optimal experience according to the program's functionality. There are several methods used in website development.

2.1. System Planning

Firstly, Level 0 Diagram Design functions to show a process and describe the scope of a system. DFD level 0 describes how everything is overall input into the system or output of the system provides an overview of the entire system. The following is an image of the level 0 Data Flow Diagram of the system being developed

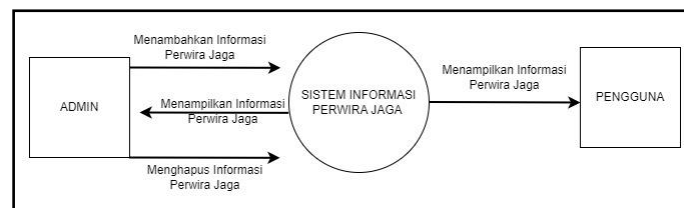


Figure 1. DFD level 0

The second stage of designing a level 1 Data Flow Diagram is a diagram from the development of a level 0 Data Flow Diagram. This diagram explains things that are more complex than a level 0 Data Flow Diagram. The following is a picture of a level 1 Data Flow Diagram from the system being developed

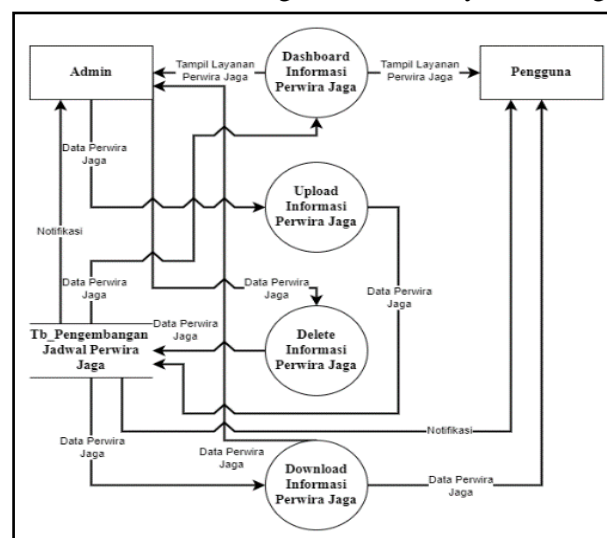


Figure 2. DFD level 1

Then the third stage of planning Use Case The diagram functions to describe the relationship between the system and actors. This diagram explains the interactions that occur between system users and the existing system and clarifies the steps that the system should take when the system is running. As for pictures Use Case Diagram of the developed system.

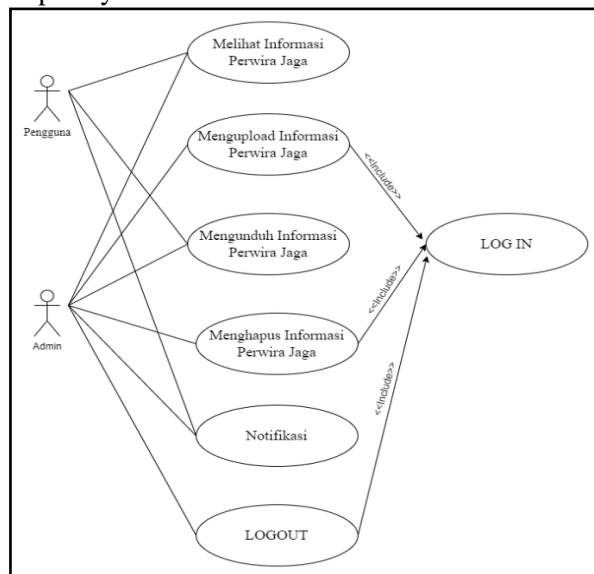


Figure 3. Use Case Diagram

The fourth stage of planning Flowchart describe each stage of problem solving in a simple, neat, detailed and clear manner using symbols that represent certain activities. Here's a picture Flowchart of the system being Developed

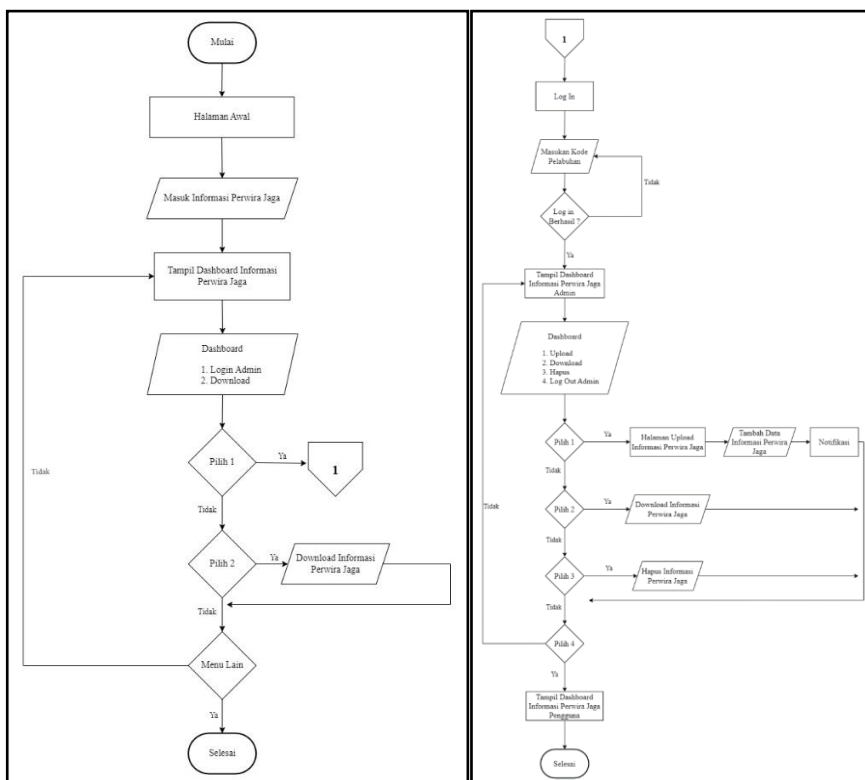


Figure 4. Flowchart

2.2. Development model

Model prototype is the life cycle of software that uses prototyping as a basis for development. In this method, the system is created based on a working model, allowing developers and clients to see and test the system from the early stages of development [9]



because the application design process requires a lot of communication between developers and system users. The prototype development model starts from Listen to Customer (Listening to Customers). Build and Revise Mock-up (Building and Repairing Prototype), Customer Test Drives Mock-up (Testing Prototype).

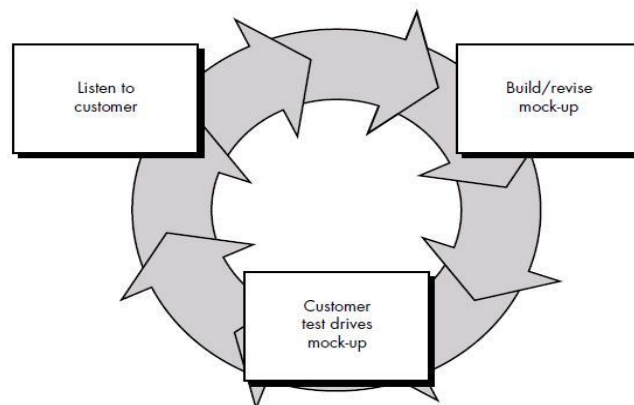


Figure 5. Model stages Prototype (Roger S. Pressman)

2.3. Test plan

The tests carried out by the author in this research used black box testing namely a software testing method that tests the program's functionality to meet the functional requirements of the program whether it can run well or not [10].

3. RESULT AND DISCUSSION

3.1. Needs Analysis

The author conducted interviews and observations with 10 respondents (5 admins and 5 service users) to identify the needs of service users on the SPS Inaportnet website at the Tanjung Perak Main Class Port Authority and Port Authority Office, Surabaya. The results of the analysis show that in an effort to improve technology and communication in the service system which is currently still incomplete, the use of WhatsApp groups as a temporary solution is considered ineffective because its scope is limited, so the development of services based on web considered to facilitate data processing and services call center emergencies, and providing information. This system involves admin and service users, with a focus on data processing, complaint service, and providing information by duty officers, where the admin's role is very important in all system activities, while the initial design website includes the main page, information dashboard for users, menu login, dashboard for admin, and menu logout admin, which allows admins to manage port data, schedule codes, telephone numbers and schedule documents and receive notifications update information, while users can access the guard officer information dashboard, download schedules, and receive update notifications.

3.2. Building / Coding System

In making the guard officer information system, the author used several specifications both from the hardware server side (hardware) or software (software). Then in the system development process website by translating the design prototype beginning into code based programming web which is functional. This step involves using development applications such as Visual Studio Code, to enable coding or HTML and PHP code more efficiently. Apart from that, Bootstrap is used as a CSS framework which makes it easier to design layouts and visual styles website.

The results of the integration that have been developed by the author in website SPS Inaportnet supports maritime operations, especially activities at the Harbor Master's Office and Tanjung Perak Main Class Port Authority, Surabaya as follows:

- a. main page,
- b. user duty officer information dashboard
- c. admin guard officer information dashboard,



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- d. menu login and logout admin,
- e. notification of information updates

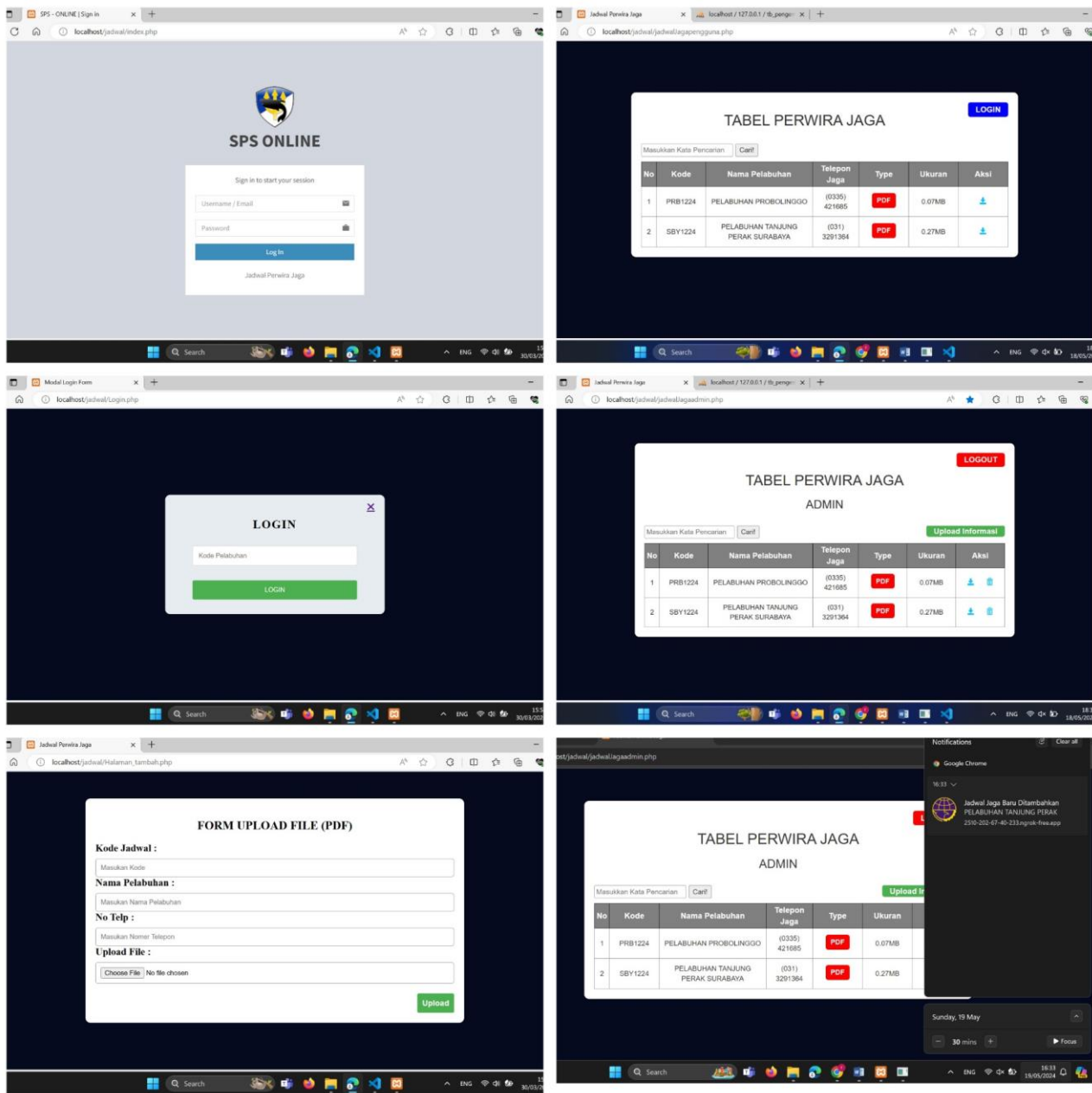


Figure 6. Results of the Integration of the Guard Officer Information System

3.3. Testing

This test was carried out by 10 respondents, consisting of users and admins. Test results black box then analyzed to describe the software and test the program's reliability. Based on the test results, the author concludes as follows:

Table 1. Data Analysis

No	Testing	Assessment	Success Percentage
1	Home Page	Good	100%
2	User duty officer information dashboard	Good	100%



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3	Admin duty officer information dashboard	Good	100%
4	Form login And logout	Good	100%
5	Notifications	Good	100%

The results of this analysis provide an understanding that in every system functional test that has been carried out no system functional failures were found. The system parts that have been tested show that the system functionality is reliable and works well according to the design process. Based on the results of research on the guard officer information system after being validated and tested using it black box testing it can be concluded that the guard officer information system can be used by users website on all platforms.

4. CONCLUSION

Based on the results of research on the development of a guard officer information system on the SPS Inaportnet website at the Harbor Master's Office and Tanjung Perak Port Authority, Surabaya, several conclusions can be drawn. First, system development using a prototyping model which consists of three stages (listening to customers, building and improving prototypes, and testing prototypes) has succeeded in producing the required features, including the main page, guard officer information dashboard for users and admins, login menu/ admin logout, as well as an information notification system that can be accessed via various platforms.

Test results using the black box method show a 100% functional success rate, however there are several implementation challenges that need to be considered. Based on interviews and observations with 10 respondents (5 admins and 5 service users), it was found that the transition from the WhatsApp system to the new system requires a period of adaptation and special training for users. Although the new system offers greater efficiency, some users still need time to adapt to the new interface and features.

To ensure system sustainability, an ongoing maintenance and development plan is required. This includes regular updates to system security, performance optimization based on user feedback, and additional features as operational needs evolve. The system also needs to be equipped with comprehensive technical documentation and user guides to facilitate the learning and adaptation process.

Overall, the implementation of the guard officer information system has increased operational effectiveness and efficiency at the Main Harbor Master of Tanjung Perak Surabaya, however its long-term success will depend on commitment to maintaining the system, ongoing training for users, and the ability to adapt to continuously evolving operational needs. For further research, it is recommended to carry out regular evaluations of user satisfaction and quantitatively analyze the impact of the system on port operational efficiency.

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