# A WEBSITE-BASED INFORMATION SYSTEM DEVELOPMENT FOR APPLYING TEMPORARY AIRPORT PASS REGISTRATION

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### Abstract

*Pass visitor is an entry permit used by guests (visitors) who carry out visits or activities at the airport, and the management and registration process for applying is still done manually. This research aims to build a website-based application for registered pass visitors and conduct black box testing. The research and development (R&D) method uses the System Life Development Cycle (SDLC) technique with waterfall as a development model that involves analysis, design, implementation, and testing. Data collection by conducting observation and document analysis. The result is a website-based application that is designed using Google Apps Script. This application has been validated by a media design expert with a validation result of 82.10% and a material expert with a validation result of 86.25% with the category "Very Feasible" and tested using Black box testing. The website information system for applying for Pass visitor registration can be used on various platforms and runs flexibly anywhere and anytime online. By conducting this system, airport management can achieve time flexibility in the registration process and convenience in managing pass visitor data storage. This system simplifies the registration process to improve the quality and security of the airport.*

***Keywords:*** *information system, airport pass, visitor pass, aviation security*

## Introduction

With the rapid development of transportation, companies are required to adjust to the development of existing progress to achieve the goals of the company or organization optimally. In addition, it is important to improve services to service users of other organizations as related partners that require increased efficiency and effectiveness of the organization (Gilliam, 2019). Service quality in the digital era improves services, as stated in (Titisan, 2023). Safety, order, and security are among the main supporting factors in the successful management and operation of airports (Wisjnoe, 2014) and the Airport Operation Service and Security Unit is responsible for maintaining the airport's security, order, and safety, and one of the related activities is issuing airport passes.

According to PM 33 of 2015, airport passes are divided into three categories: temporary individual passes (visitor), permanent individual passes, and vehicle passes. Furthermore, the airport pass (person) is an entry permit divided into two categories: permanent passes and temporary passes. The issuance of passes is adjusted to the type of needs, and the mechanism of the licensing system regulates the procedures, requirements, and provisions regarding entry permits for restricted areas with the use of airport passes as well as the duties and functions of each work unit related to the granting of entry permits. Airport passes are given to people who will carry out activities or have interests in aviation in a limited area at the airport (Aini et al., 2020). The airport pass is not only a sign of entry but also a security control for airport security officers to supervise or monitor people and motorized vehicles in and to restricted areas so that security and safety at the airport are more guaranteed. The issuance of airport passes can run smoothly if they meet the requirements and issuance procedures that have been determined.

At Jenderal Ahmad Yani Airport Semarang, temporary airport passes (visitors) are made manually, with the application procedure having to come to the airport pass service office. The handling of documents is still manual in contrast to applying for an individual airport pass extension and making a vehicle pass that can be accessed online starting from the end of 2023. The online making of airport passes can be accessed through the official website of Jenderal Ahmad Yani Airport Semarang. Service features have been provided for applying for an individual airport pass extension and a Vehicle Entry Permit. However, this does not apply to making a visitor airport pass, where the submission of a visitor airport pass is still manual. This is an obstacle for some agencies or companies that want to visit the airport, whether for audit/inspection purposes, official visits, or urgent training visits.

In implementing the issuance and printing of visitor passes at Jenderal Ahmad Yani Airport Semarang, a total of 30 visitor passes for each year. The Visitor Pass Loan is free of charge if the activities and use are for audits/inspections, official visits, and education and training practices. The visitor airport pass is only valid for one day and must be returned on the same day the pass holder receives the visitor pass. If the activities carried out at the airport are more than one day, the mechanism for borrowing the visitor pass is to return it on the same day. Still, for the next day, the applicant must take or borrow it again and return it at the specified time.

In the process of making and issuing visitor passes as mentioned above at this time at Jenderal Ahmad Yani Airport Semarang, there are still several obstacles related to coordination and communication between the Airport Operation Control Head (AOCH) as the one who approves the issuance of visitor passes, then the airport security who screens and is also responsible for the issuance of visitor passes, and the PAS service officer as the one who prints the visitor pass and checks the completeness of the required data. Therefore, there is a need for better coordination between several parties related to the issuance and printing of visitor passes, such as making a website system for submitting visitor passes where the required data and completeness of documents can be stored in digital form. Related parties can also check each other on the website so that

communication and coordination are expected to run well and smoothly.

(Nugraha et al., 2023) develop the web using Unified Modelling Langguage (UML) start with use case diagram, and based on research by (Amalia et al., 2022) the project start with the observation, for a better picture of the need of build the application. Our research using the System Development Life Cycle (SDLC) technique used in previous software system development (Wahyudin & Rahayu, 2020) and use the waterfall method due to the easiness and suitability in this research (Rifanda et al., 2023; Saravanos & Curinga, 2023). This research aims to develop a solution based on the problem of the airport Pass Service Unit by providing digital-based visitor airport pass submission services that can be accessed online which is then expected that the system can be connected to the official website of Jenderal Ahmad Yani Airport Semarang as an effort to improve the quality and effectiveness of the service of making visitor airport passes to make it easier for those who want to carry out a visit to Jenderal Ahmad Yani Airport Semarang. Through this research, we hope airport management can achieve time flexibility in the registration process and convenience in managing pass visitor data storage.

**Methods**

The website development design used in this study uses the System Development Life Cycle (SDLC) technique used in previous software system development (Wahyudin & Rahayu, 2020). In this study, we use the Waterfall method (Rifanda et al., 2023; Saravanos & Curinga, 2023). This research will be conducted in Ahmad Yani Airport Semarang, Central Java, Indonesia, for 6 months in 2024.



**Figure 1.** The Model Used in Research

Based on the figure above, there are five stages of the waterfall method, but in case of time limitation, this research finished in the fourth stage. Due to time and cost constraints, the system is still developing. This aligns with the research (Hikmah & Ahmadi, 201), which uses only four stages because it is limited to testing. First, the analysis stage involves collecting data and information measured by interviews with the airport pass service officer. Next is the design stage, which is designing a system adjusted to the needs (Leng et al., 2021; McGorry et al., 2022). This results in the analysis stage by arranging a use case diagram, flowchart system, and design interface system (Suratno & Shafira, 2022). Validation is also conducted in this stage. Material experts and media experts carry out the validation process.

**Table 1.** Validator Classification

| Scale | Validator Classification |
|---|---|
| 1, 0 – 1,8 | Vey Not good |
| >1,8 – 2,6 | Not Good |
| >2,6 – 3,4 | Less Good |
| >3,2 – 4,2 | Good |
| >4,2 – 5,0 | Very Good |

After obtaining data from the results of expert validation, calculate or analyze the data obtained. The alternative format refers to the scale initiated by (Putri et al., 2021). Calculate the percentage of eligibility for answers obtained from each validation sheet or validation questionnaire by experts with the following formula, $P = \frac{f}{N}$ x 100 %, with P = Percentage number, F = Number of scores obtained, and N = Total maximum score.

After calculating the percentage, interpret the results of the calculation of the percentage of feasibility obtained previously to determine the feasibility of the system as a whole. The expert validation (Divanca et al., 2024) assessment is based on the validation criteria in the table below.

**Table 2.** Media Feasible Category

| Score in Percent | Feasible Category |
|---|---|
| <21% | Ver Not Feasible |
| 21% - 40% | Not Feasible |
| 41% 60 % | Feasible Enough |
| 61 % - 80 % | Feasible |
| 81 % - 100% | Very Feasible |

Furthermore, after experts validate the initial product, the shortcomings of the

application system can be identified and corrected. The next step is validation again to determine the system's feasibility by experts. After the design stage, the implementation is followed by testing and evaluating the device's functionality using Google Apps Script. Furthermore, system testing uses black box testing focusing on the input and output processes.

## Results And Discussions

After carrying out the analysis by conducting interviews with the airport pass service officers, the result of the interview is the registration and submission procedure are still carried out manually with the procedure of coming directly to the Pass Service Unit by bringing the predetermined requirements; this is an obstacle for parties or companies that will carry out visits so that they have to take more time in the process. Furthermore, pass service officers also still record visitor airport pass loan data manually in the loan logbook, and service officers found problems such as lost visitor pass cards, data recording that creates the potential for loss of data in the logbook, and unsystematic loan data recording.

A design plan for the application to solve those problems was created for this website system, displayed in the use case diagram (Amalia et al., 2024), flowchart, and interface design, as shown in Figure 1.
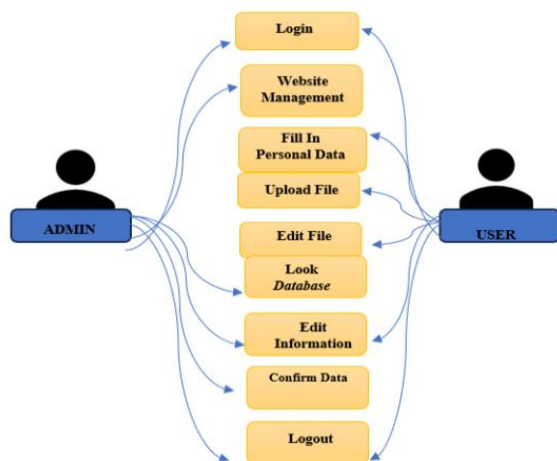


**Figure 2**. Use Case Diagram

The diagram shows a collection of use cases and the actors involved. This diagram is important in organizing and modeling the necessary system behavior.
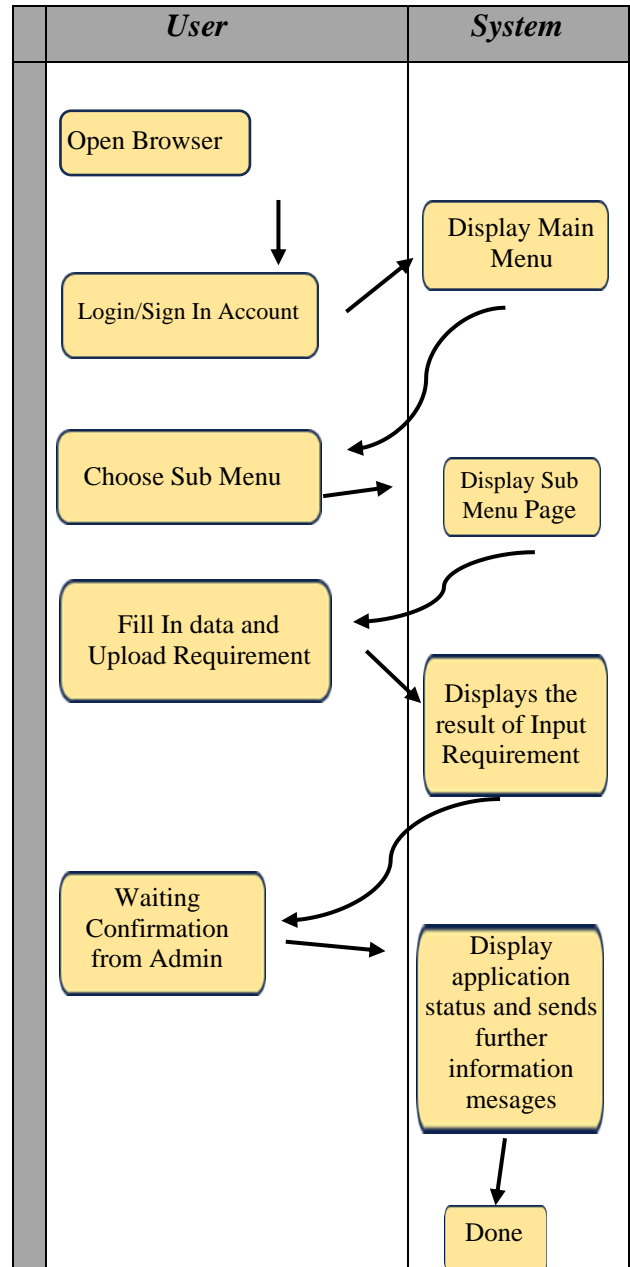


**Figure 3**. Flowchart Diagram

The system flowchart diagram is a chart that displays a workflow that occurs in the system as a whole and explains the sequence of processes in the system (Muhammad et al., 2022). The flow of information systems is significant in a system process when data is transmitted accurately and efficiently between different components within the system. A well-designed information flow can enhance decision-making, improve operational performance, and reduce potential errors. By streamlining data communication, organizations can better coordinate and achieve their objectives more effectively.

**Figure 4**. Interface Design

The Interface design of the website includes the main display and display model and menu on the system to be produced (Mubarok et al., 2022). The main page is the initial page when the website is accessed, and it displays the login form page. Inside is a textbox where you can fill in the email and password used to access the page as an admin or user. After completing the design stage, it is continued to the implementation stage, where a website-based visitor airport pass registration application is made following the design or design that has been made previously. After the interface design, we conduct limited testing by material and design experts (Ardianti & Susanti, 2022). The data collected at the evaluation stage came from 2 (two) types of subjects: the first was validation from practitioner experts, and the second was validation from design experts with validation sheets. The following is a product assessment from experts that is carried out before being implemented for users:

**Table 3.** Validation Results by Media Experts

| No | Assessment Aspects | Percentage | Criteria |
|----|--------------------|-----------|----------|
| 1 | Display | 80% | Feasible |
| 2 | Color | 80% | Feasible |
| 3 | Letter | 93% | Very Feasible |
| 4 | Figure | 80% | Feasible |
| 5 | Menu | 80% | Feasible |
| | Average | 82,10 % | Very Feasible |

The table above is the result of validation by media experts carried out by M. Wahid Alqorni, S.Kom as an expert in the field of media and informatics, where the results get a score of 80%, the coloring aspect 80%, the font aspect 90%, the image aspect 80%, the menu aspect with a score of 80%. It is known that the average score of the five aspects is 82.10% and is included in the "Very Feasible" category.

**Table 4.** Validation Results by Expert Practitioners

| No | Assessment Aspects | Percentage | Criteria |
|----|--------------------|-----------|----------|
| 1 | Practicability | 85% | Very Feasible |
| 2 | Ease of Use | 95% | Very Feasible |
| 3 | Content | 85% | Very Feasible |
| 4 | Language | 80% | Feasible |
| | Average | 86,25 % | Very Feasible |

The table above is the result of validation by practitioner experts carried out by Heppy Widya Antika as a PAS officer in the Airport Operation Landside, Terminal & Service Improvement (AOLTSI) unit, where the results of the validation above are included in the "Very Feasible" category because the average score of 4 (four) aspects of practitioner expert assessment is 86.25%.
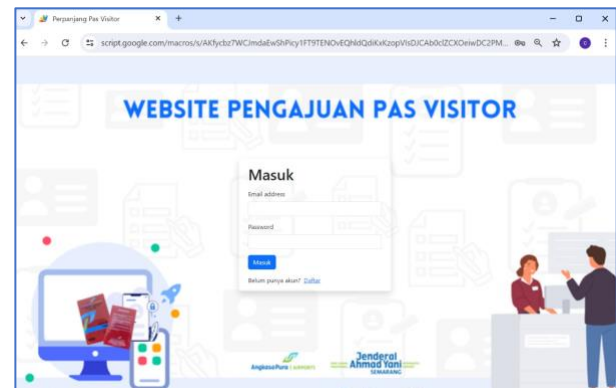


**Figure 5**. Website Login Page

There is a login page or registration (sign up) through the email of each representative/individual who will apply for a visitor airport pass. After successfully logging in through their respective email accounts, the main menu page will appear.



**Figure 6**. Main Menu Page

Figure 6 shows the main page, which contains information related to the terms and conditions for submitting a visitor pass application. Furthermore, a "Visitor Pass Application" feature can be accessed to input personal data and files required for submitting a visitor airport pass.
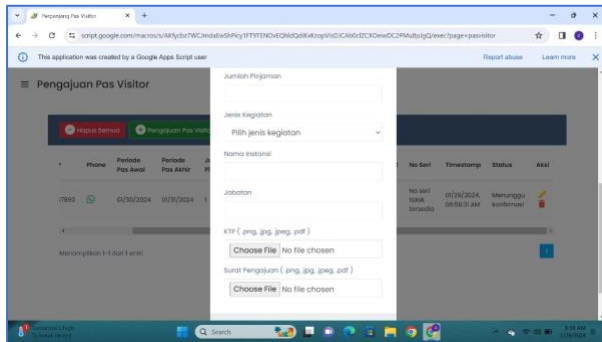


**Figure 7**. Registration Form Page

After implementation, System Testing is continued, where, at this stage, the aim is to determine whether the system program used can function either as an input or output produced (Abdillah et al., 2023). Application testing of the system uses *black box testing,* which focuses on the input and output process of results in the application system program (Widhyaestoeti et al., 2021). The black box testing carried out is in the click section of the login button, menu button, calendar button, activity type button, "choose file" button, "add' button, action button, number button, confirm and reject button, logout button, and guide menu button. In the part that was tested, it was concluded that all tests on the buttons were appropriate.

Based on the results, we know that the waterfall model is suitable for this research because it is a classic model that is systematic and sequential in building software to minimize errors that might occur (Setiawan et al., 2020). The waterfall method is considered a very suitable method for developing a system. Although this waterfall mode has been around for a long time, this model is often used in Software Engineering development (Listiyan & Subhiyakto, 2021). The waterfall model is also often used because it is a simple and systematic classic method consisting of several stages where the previous stage's output can be input for the next stage (Andry & Stefanus, 2020). The design of the visitor pass application website design at Ahmad Yani Airport Semarang adapts to the design of the airport's official website, especially on the features of the airport pass extension website page that are already available, namely coloring and layout, which are then modified and the addition of several new features that have been adapted to the needs of the visitor pass application and the flow of the application process (Oktaviani et al., 2022). In addition, this design also pays attention to the user-friendly aspect so that users can access and understand the submission flow more intuitively. Adjustments are made by considering the user experience, things like simplifying navigation, using informative icons, and including visual step guides to minimize errors in the submission process, which are essential parts of making applications (Rohmah & Yulianton, 2024).

The results of the validation of material experts, with an average score of 86.25%, and media experts, with an average score of 82.10%, are in the "very feasible" category, meaning that the application is following the needs in line with the research (Putri et al., 2021) who came up with the rating scale format and its classification. The expert validation assessment is based on criteria according to the research (Divanca et al., 2024) related to the interpretation of the calculation of the percentage of feasibility obtained previously to determine the system's feasibility as a whole. The calculation uses the validation of material and media experts because the calculation is easy to understand by expert validators in assessing several aspects and then facilitates the process of managing the validation results of the assessments that have been obtained (Taufik & Doyan, 2022).

**Conclusion**

The website-based visitor airport pass registration information system simplifies the process of applying for registration and borrowing the visitor airport pass for parties who will carry out activities at Jenderal Ahmad Yani Airport Semarang. Thus, this system can be used on various platforms and runs flexibly anywhere and anytime online, so it can simplify registering a visitor pass to improve

the quality of service, especially at the Ahmad Yani Semarang Airport Pass Service Unit.

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