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Design of a Lost and Found Reporting Website Using the Prototype Method at Adi Soemarmo Airport

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Abstract

Adi Soemarmo Airport is one of the airports responsible for providing optimal service to passengers, including in the handling of lost and found items. Until now, the reporting process for lost items has been carried out manually, making it inefficient and potentially causing delays in the item retrieval process. Therefore, a website-based system is needed to facilitate passengers in reporting lost items independently. The research problem in this study is how to design a website-based lost item reporting system using the prototype method to improve passenger service at Adi Soemarmo Airport. This research is a system development study aimed at providing a more practical and effective platform for reporting lost items. The results of testing conducted on 97 respondents who had previously used air transportation services indicate that the lost item reporting website functions properly and is suitable for use. Based on the usability test, a score of 95.7% was obtained, which falls within the 81%–100% range, placing it in the "Highly Feasible" category. In addition, validation by three subject matter experts showed a feasibility score of 94%, which is also categorized as "Eligible for Publication." From these results, it can be concluded that the website-based lost item reporting system can help simplify the reporting process for passengers and support efforts to improve service quality at Adi Soemarmo Airport.

1 INTRODUCTION

Airports play a crucial role in the national transportation system, especially in an archipelagic country like Indonesia. As primary hubs of inter-island mobility, airports involve a range of intensive activities, from check-in to boarding [1]. During these processes, it is common for passengers to accidentally leave behind personal belongings such as bags, wallets, or important documents [2]. If not addressed efficiently, such incidents can hinder passenger convenience and delay services. Unfortunately, many airports still rely on manual systems to report lost items, which are often time-consuming and ineffective [3].

Passengers may be unaware of the reporting procedures or find it difficult to access available services [4]. In response to technological advancements, digital solutions—particularly web-based systems offer an effective alternative to streamline the reporting and handling of lost items. A web-based lost and found reporting system can enhance efficiency, transparency, and accessibility for both passengers and airport staff. Such systems allow reports to be submitted anytime and anywhere, while enabling airport authorities to manage data in real time and in a more organized manner [5]. This study focuses on designing

a prototype-based website system for reporting lost items at Adi Soemarmo Airport to improve overall passenger service quality.

The system design refers to standard development principles, including structured input-process-output mechanisms and interconnected subsystems [6]. A good reporting system must be capable of collecting, processing, and delivering data accurately and on time [7]. The main platform used for implementation is a dynamic website, built using programming languages such as HTML, CSS, PHP, and JavaScript [8]. Visual Studio Code was used as the main development environment due to its flexibility and support for multiple languages [9], while hosting and management were conducted using cPanel Hosting services were supported by appropriate domain naming systems, including gTLDs and ccTLDs [10].Through the integration of these components and technologies, the proposed system aims to improve the quality of passenger services and support airport digital transformation initiatives.

2 METHOD

This study adopts the Research and Development (R&D) approach as described by [11], which aims to produce and refine a specific productin this case, a web-based system for lost item reporting at Adi Soemarmo Airport. The research focuses on applying the Prototype model, known for its interactive and iterative design process, allowing developers and users to collaborate closely throughout the development phase [12]. According to Gordon [13], a prototype serves as a preliminary model of a system that can be evaluated and improved based on user feedback before full implementation. This method is particularly suitable for solving communication gaps between users and system analysts, as it enables users to visualize and interact with the system early in development [14]. Prototyping also offers time efficiency, cost-effectiveness, and allows for user-centered design improvements during the system iteration process [15]. The main function of this website is to manage user reports and ensure efficient response handling through an interactive online interface [16].

The prototyping process in this study involves several key stages: needs assessment, rapid prototyping, user feedback, and refinement. Initial data collection was conducted through direct interviews with AVSEC personnel at Adi Soemarmo Airport to identify problems in the current manual process and to understand system requirements. The next stage involved designing a mock-up using Visual Studio Code and implementing basic functions such as form submission and data handling, which were hosted via cPanel and domain integration as suggested [17]. The prototype was evaluated by several experts including one IT specialist from Politeknik Penerbangan Surabaya, one airport operations expert, and one AVSEC officer, who assessed the prototype based on performance, efficiency, service quality, user control, and clarity of information criteria adapted from the Web Quality Evaluation Method [18]. The goal of this validation process was to ensure that the system met both technical and operational expectations, and that it could contribute to improving passenger services, Content Management System (CMS) is a software application that facilitates the management of website content without requiring users to have advanced web development knowledge [5].

To strengthen the validation, a usability evaluation was conducted using a questionnaire distributed to 97 cadets from the Air Transportation Management program at Politeknik Penerbangan Surabaya, representing end-users familiar with airport procedures. The questionnaire design was based on Likert-scale-based assessment as recommended by [12] and [11], covering aspects such as interface usability, accessibility, response time, and overall system effectiveness. The feasibility of the system was then calculated using a percentage-based formula as proposed by [19], which categorizes system feasibility into five levels, ranging from "very unfeasible" to "very feasible." A system is considered valid when the feasibility percentage exceeds 61%, which serves as the benchmark in this study. Overall, the chosen methodology aligns with similar digital service innovation research frameworks, such as those implemented in airport information systems [7] and e-service quality evaluations [20], making it well-suited for addressing real-world service challenges in the aviation sector.

3 RESULTS

This section presents the results and findings obtained during the development of the Lost and Found Reporting Website at Adi Soemarmo Airport using the Prototype Method. The development was carried out through several iterative phases, including information gathering, prototype construction, system interface design, system deployment, and expert/user testing. Each phase is detailed below.and evaluate the existing shortcomings and issues in the current passenger service system.

Information Gathering

Data collection was conducted through direct interviews with the Aviation Security (AVSEC) Supervisor at Adi Soemarmo Airport. The purpose of this interview was to obtain insights into the current procedures for handling lost and found items, which are still performed manually. The collected information helped determine the system's key features and align the web application with real operational needs.

Prototype Development

A responsive and interactive prototype was built using HTML, CSS, JavaScript, and PHP. Key features included:

1. A report form with fields for name, contact, item details, and image upload.
2. Automatic tracking code generation.
3. Confirmation page and notification via PHPMailer.
4. Embedded Google Maps for airport location.
5. Admin-side interface for managing submissions.

Website Deployment

The website was hosted on Hyper Cloud Host and made publicly accessible via the domain www.bandara.my.id. Files were uploaded using cPanel, and the DNS configuration was completed to connect the domain with the hosting server.

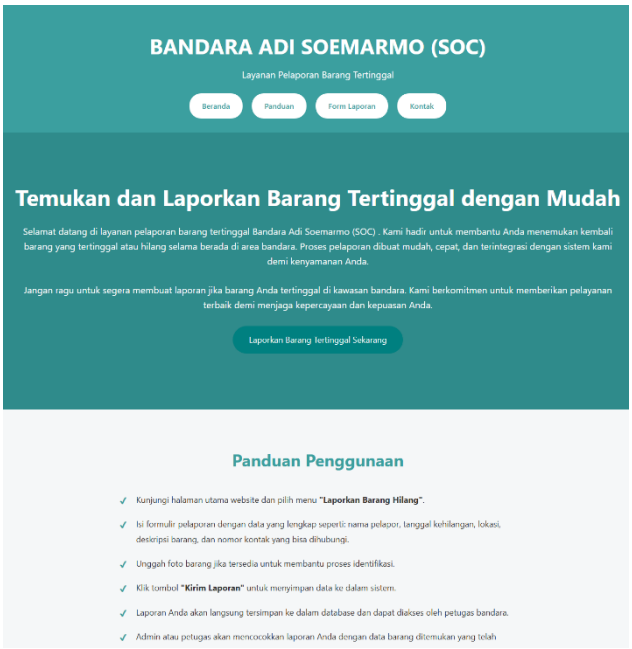

Figure 1. Lost and Found Reporting Website

Expert Testing

Three experts evaluated the system using the PICES framework:

1. Performance, Information, Control, Efficiency, and Services were scored.
2. The system received an average expert score of 94%, indicating it is valid and operationally feasible.

Table 1. Expert Testing

No	Aspect	Scores Obtained from Subject Matter Experts			Max Score
		IT Expert	Airport Ops	Avsec	
1	*Performance*	9	10	8	10
2	*Information*	10	10	10	10
3	*Control*	10	10	7	10
4	*Efficiency*	9	10	10	10
5	*Services*	9	10	9	10
Total		**47**	**50**	**44**	**50**

Overall Expert Score: 94% → Valid

Aspect	Percentage of Scores Obtained from Subject Matter Experts (%)			Accumulated Score Percentage	Remarks
	IT Expert	Airport Ops	Avsec		
Total	**94**	**100**	**88**	**94**	**Suitable for Use**

User Feedback

A usability questionnaire was distributed to 97 student respondents. The analysis showed a total usability score of 95.7%, placing the system in the "Very Feasible" category. Users reported ease of use, clarity of language, accessibility, and usefulness of the information provided.

Usability Indicator	Percentage
Website is a good information medium	99.3%
Website is easy to access	93.6%
Language is easy to understand	94.8%
Information is helpful	94.8%
Users feel benefited from the website	94.8%
Website improves passenger service	96.9%

Research Discussion

The purpose of this discussion is to evaluate whether the Lost and Found Reporting Website is functioning as expected or still requires further refinement. System testing was conducted to determine the compatibility of the developed website with the initial prototype design and whether it meets user needs in an operational environment.The evaluation process involved testing each component of the website—ranging from form inputs, image uploads, email notification functions, to admin panel accessibility—to identify any errors or areas for improvement. This testing was performed in collaboration with subject matter experts (IT professionals, airport security officers, and airport staff) as well as student users to ensure the system aligns with real-world requirements.

Based on expert validation and user feedback, the following observations were made:

1. Website Accessibility and Performance: The website can be accessed properly via desktop and mobile devices, with all main features (report submission form, automatic email notification, and report tracking code) functioning as designed.
2. Areas for Improvement Identified:
    - Occasional delay in email delivery due to server processing time.
    - Limited offline usability, as the system is fully web-based and depends on internet access.
    - Some users requested a search feature to track the status of submitted reports directly via the website.

Despite these minor issues, the system is considered highly usable and effective, as confirmed by an average validation score of 95.7% from a total of 97 respondents. According to the usability scoring interpretation, this percentage falls into the category of "Very Feasible", indicating the system is ready to be implemented in a real airport environment with minor adjustments. Overall, the Lost and Found Reporting Website has proven to significantly improve the reporting process at Adi Soemarmo Airport, offering a more structured, responsive, and accessible solution for both passengers and airport staff.

CONCLUSION AND RECOMMENDATIONS

The Lost and Found Reporting Website developed for Adi Soemarmo Airport serves as a digital solution to improve reporting services for lost items. This system was built using the Prototype Method, ensuring continuous refinement based on expert and user feedback. Designed to be accessible and user-friendly, the website enables passengers to report lost items online, reducing manual processes and enhancing overall service quality. With a validation score of 94% from experts and a usability score of 95.7% from 97 users, the system has proven to be both technically and operationally feasible.

To fully implement this system in the airport environment, institutional support from airport management is essential. Further development can be achieved by adding smart features such as real-time notification systems, integration with internal airport services, and improved mobile responsiveness. Broader promotion and user education are also crucial to maximize adoption. With future improvements and cross-department collaboration, this web-based system can serve as an innovative public service tool, supporting airport digital transformation and improving the passenger experience in Indonesia's aviation sector.

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