DESIGN OF CORE SECURITY APPLICATION AS A WEBSITE-BASED RECORDING OF VIOLATIONS OF AIRPORT PASS HOLDERS AT AIRPORTS

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ABSTRACT
With the increasing number of flights and the increasing mobility of service users, an airport must maintain the quality of service to achieve optimal flight security and safety. One of the efforts made by the Jenderal Ahmad Yani Airport in Semarang in maintaining the quality of aviation personnel is by recording violations of airport pass holders. The recording of violations by airport pass holders is intended to improve the discipline of airport pass holders, improve order, and determine the security culture at Jenderal Ahmad Yani Airport Semarang. One of the efforts to create this is by developing a website-based application for recording violations of airport pass holders. This research aims to design a Core Security application as a website-based recording of violations of Airport pass holders at Jenderal Ahmad Yani Airport Semarang. The research method used in this study is the Research and Development (R&D) method with seven stages of research, namely: Potential Problem Identification, Information Collection, Product Design, Product Validation, Product Improvement, Product Trial, and Product Revision. The results of this study show that validation has been carried out with an average assessment of 85% with a very feasible category. Based on the results of the research and discussion, it can be concluded that the website-based Core Security application is effective in supporting the operation of recording violations of airport pass holders at Jenderal Ahmad Yani Airport, Semarang.

Keywords: *Violation recording, airport pass, website.*

1. INTRODUCTION

It was explained that 1% of all total airport pass holders who have been issued at Zainuddin Abdul Madjid Lombok Airport were recorded as committing violations of misuse of the entrance permit card or airport pass. In the study, it was concluded that it is important to record violations of airport pass holders to find out what security culture is suitable to be applied to an airport so that the violation does not occur repeatedly [1].

The registration of violations of airport pass holders at Jenderal Ahmad Yani Airport Semarang was handled by Aviaton Security personnel., the recording of violations of Airport pass holders at Jenderal Ahmad Yani Airport Semarang is still conventional recording, the Aviation Security receives a report through a message from the whatsapp group then the Aviation Security Investigator records the reported violation on the microsoft excel application.

Therefore, in an effort to create aviation security and safety, the author has innovations regarding the digital-based recording of violations of Airport pass holders at Jenderal Ahmad Yani Airport Semarang. So that it can make it easier for related personnel to record violations with better output and storage by utilizing the QR Code contained in the Airport pass with data input through the website so that it can be easily accessed titled, "Design of Core Security Application as Recording Violations of Website-Based Airport pass Holders at Airports" to improve the security culture at Jenderal Ahmad Yani Airport Semarang.

2. LITERATURE REVIEW

2.1 AIRPORT

According to the Law of the Republic of Indonesia Number 1 of 2009 concerning Aviation, an airport is defined as an area on land or waters with certain boundaries that is used as a place for aircraft to land and take off, passenger boarding and disembarking activities, loading and unloading goods, and also as a place for intra and inter-mode of transportation. This area is equipped with aviation safety and security facilities, as well as various other basic and supporting facilities that support airport operations.

2.2 AIRPORT PASS

According to the Regulation of the Minister of Transportation Number PM 33 of 2015 concerning Access Control to Restricted Security Areas at Airports, Airport pass or Access Control Signs are officially into Security Restricted Areas, Sterile Areas, and Restricted Areas of Airports.

2.3 AIRPORT PERSONEL

According to the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 37 of 2021 concerning Airport Personnel, Airport Personnel are individuals who are responsible for business processes at airports that are directly related to the implementation of the operation or maintenance of airport facilities.

2.4 WEBSITE

A website is a set of interconnected pages that can be accessed through the internet. That way, websites become an important means to access various information more efficiently and easily [2]

2.5 QUICK RESPONSE CODE

The word "QR" is meant for a quick response or quick response that suits the purpose, i.e. to take data quickly and get feedback quickly as well [3].

Quick Response Code is an update of barcodes or barcodes, QR Codes are able to store more information, both vertical and horizontal information. Therefore, QR Codes are able to accommodate more information [4].

3. METHODOLOGY

3.1 RESEARCH AND DEVELOPMENT

In this study, the author uses the Research and Development (R&D) research method, Research and Development (R&D) is a method developed to make a new product, currently this Research and Development method is often used for research related to the technology development process [5].

This research is generally carried out systematically, to find, revise, develop, produce, and test the effectiveness of a product, so that it can get newer, more effective, efficient, productive, and meaningful methods or strategies [6].

This research was created using the development model popularized by Borg & Gall. The Borg & Gall development model is a process used to design a system and validate the system [7]

In the 10 (Ten) stages of the Borg & Gall development model, the author simplifies it to 7 (Seven) stages of the development model to produce a product that is ready to be implemented. The simplification of the stages of the Borg & Gall development model from 10 (Ten) stages to 7 (Seven) stages is carried out to shorten time and save costs but still with results that are in accordance with the criteria for writing the development model. The simplification of the development model is carried out to increase efficiency and effectiveness while maintaining scientific rigor for optimal results [8]

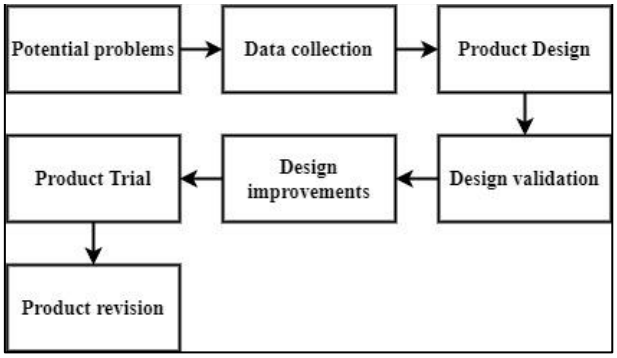

Figure 3.1 Research and Development Borg & Gall Model

3.2 RESEARCH TECHNIQUES

The stages in this Testing Technique include 3 (Three) stages, these stages are used to analyze the application [9]. The three stages are testing, system evaluation, and use the system.

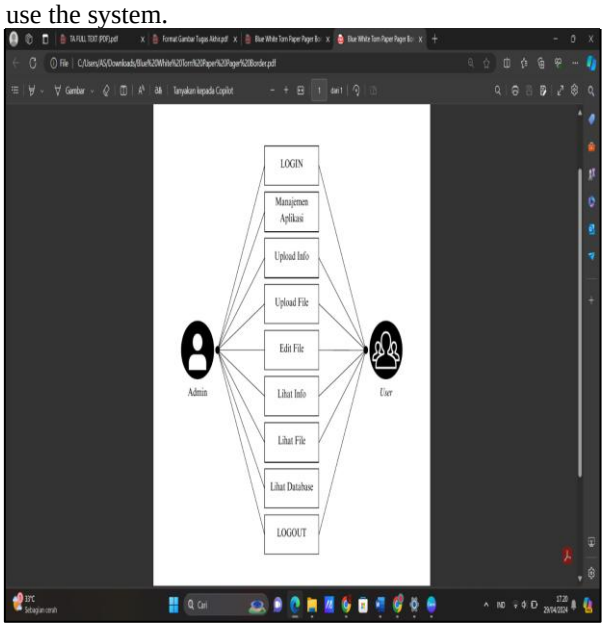

Figure 3.2 Use Case Diagram

3.3 DATA COLLECTION

The data collection method in this study uses tests carried out by experts or a small group, namely users as validators who are poured into a validation questionnaire [5].

3.3.1 Quantitative Data

The data collection method to determine product quality by providing a questionnaire in the form of a checklist to obtain an assessment consisting of design experts and material experts and providing a questionnaire to users to obtain responses [10]

3.3.2 Qualitative Data

The qualitative data collection method in this study is by:

a. Observation

Observation is a data collection technique that has its own characteristics compared to other qualitative data collection, namely obtaining information by directly observing an object carefully and researching it carefully

[11]. In this study, the author uses an observation sheet in data collection [12].

b. Interviews

The information collection in this study uses purposive sampling, which is a non-probability technique, where the author deliberately selects individuals based on their relevance to the research question or expertise in their field [5]. Therefore, the author chose the Airport Security Investigator as a source of information, because the handling of violations at Jenderal Ahmad Yani Airport Semarang is handled by the Airport Security Investigator

c. Documentation

It is a collection of evidence in the form of pictures or photographs. In the research that has been carried out, documentation is carried out to strengthen data on the problems that occur [5].

3.4 DATA ANALYSIS TECHNIQUES

At this stage, there are two data analysis techniques carried out by researchers, namely data analysis techniques carried out by experts and data analysis techniques carried out by Aviation Security personnel. The data analysis techniques used in this analysis technique are:

3.4.1 Quantitative Data Analysis Techniques

Quantitative data for this study were obtained from test sheets for material experts and design experts as well as test results from representatives of Aviation Security personnel of Jenderal Ahmad Yani Airport Semarang. The assessment steps are as follows:

a. Data Analysis Techniques by Experts

The research instrument uses design experts and material experts to determine the suitability of the display of colors, letters, and images based on the perspective of design experts, and the analysis of the conformity of the Core Security application to applicable regulations and operational standards by material experts. The design quality and content of the application are analyzed and then validated by interpreting the results of the Likert scale.

Table 3.3 Table of eligibility criteria

No	Skor dalam persen (%)	Skala nilai	Kategori kelayakan
1	< 21%	1	Sangat Tidak Layak
2	21 – 40%	2	Tidak Layak
3	41 – 60 %	3	Cukup Layak
4	61 – 80 %	4	Layak
5	81 – 100 %	5	Sangat Layak

To draw conclusions related to the results of data analysis, the author draws conclusions by taking the average value with the following formula (Sugiyono, 2022) [5].

$$X = \frac{\sum Xi}{n}$$

X : Mean (average)
∑ Xi : Total of 1st X to Xn
N : Number of Respondents

b. Data Analysis Techniques by Aviation Security Personnel

The data analysis technique carried out by Aviation Security personnel is carried out by testing the Core Security application in recording violations of airport pass holders, the data obtained is quantitative data.

3.4.2 Qualitative Data

Qualitative Data Analysis is obtained from the process of selecting existing data from observation sheets that have been carried out in the field which can be in the form of descriptive findings [5].

Based on the standard percentage criteria on the questionnaire, the indicator for the development of a website-based Airport pass violation registration application called Core Security can be said to be successful if it gets a percentage of ≥ 61%, which means that the research conducted by the author can be said to be successful. If the percentage shows a result ≤ 60%, it indicates that this development research study is not ready to be implemented or can be implemented by requiring further revision [13].

3.5 PLACE AND TIME OF RESEARCH

The research time used by the author to conduct this research is from October 2023 to July 2024. The place of research and the place of this research is at Jenderal Ahmad Yani Airport Semarang. The author chose this location as the object of research because he has carried out On the Job Training on October 5, 2023 – January 31, 2024.

4. RESULTS AND DISCUSSION

4.1 PLAN RESULTS

Research on the design of the Core Security application as a record of violations of airport pass holders was carried out by the author based on the Research and Development (R&D) research method with the Borg & Gall development model which has been simplified into 7 (seven) stages, namely: Potential Problems, Information Collection, Product Design, Product Validation, Product Improvement, Product Trial, and Product Revision.

4.1.1 Potential Problem Stage

Potential analysis and initial stage of the problem to determine the type of application design that needs to be developed from November 2023 to January 2024 at Jenderal Ahmad Yani Airport Semarang.

The problem that occurs in the recording system of violations of airport pass holders is that the recording is still conventional which is less efficient and does not have a storage medium.

Potential solutions to problems that occur in the Airport Pass holder violation recording system are by updating the system that can be accessed by Aviation Security personnel using smartphones.

In the conditions that occur at Jenderal Ahmad Yani Airport, Semarang can be solved by establishing a Core Security application system as a website-based recording of violations of airport pass holders. Core Security is designed to make it easier for Aviation Security to record violations of airport pass holders with more accurate information.

4.1.2 Information Collection Stage

The information collection stage is the stage where the author observes the recording of violations of airport pass holders at Jenderal Ahmad Yani Airport Semarang, the process of reporting and recording violations of airport pass holders at Jenderal Ahmad Yani Airport Semarang as follows.

a. Enforcement of airport pass holders

Aviation Security personnel received reports of violations committed by airport pass holders through a whatsapp group. Then Aviation Security personnel in the field visited the location of the violation and identified the violation that occurred.

b. Follow-up on airport pass holder violations

If the violation is only "light", then only a reprimand is given. However, if the violation is "moderate/severe", the violator must be taken to the screening office so that further violations are identified by the Aviation Security Investigator to determine sanctions for the violator, then the violation and sanctions received by the violator are recorded on the Microsoft Excel application

c. Violation Sanctions

If violations have been identified, sanctions will be imposed for violators According to the Regulation of the Minister of Transportation Number PM 33 of 2015 concerning Access Control

Sanctions for violators are:

1) Warnings 1, 2, & 3 (Light)
2) Airport pass freeze (Moderate)
3) Crevocation of airport pass permit (Heavy)

In addition to the sanctions set above, violators can also deal with the authorities if the violations committed violate the law.

According to the results of an interview conducted with the Airport Security Investigator, "there is a need for an update from the old recording system to the new recording system because the current recording system has never been updated from 2018". Based on the existing problems, it is necessary to design a Core Security application as a record of violations of airport pass holders at Jenderal Ahmad Yani Airport Semarang.

4.1.3 Product Design Results

The results of the design stage are based on the information that has been researched at the information collection stage, then will display the system flowchart and the display of the Core Security application design.

a. System Flowchart Diagram

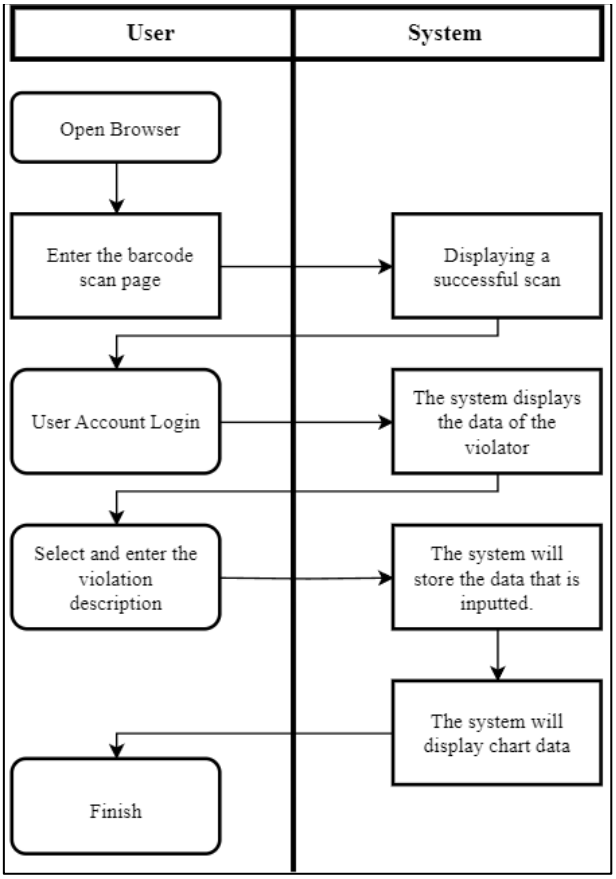

Figure 4.1 Core Security Application Flowchart

b. Core Security Design Display

1) QR Code Scanner

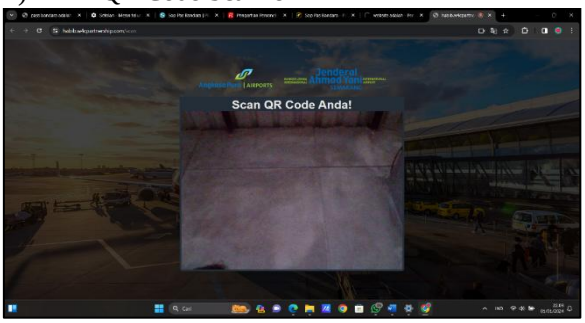

Figure 4.2 Display of QR Code Scanner Core Security Application

2) Dashboard

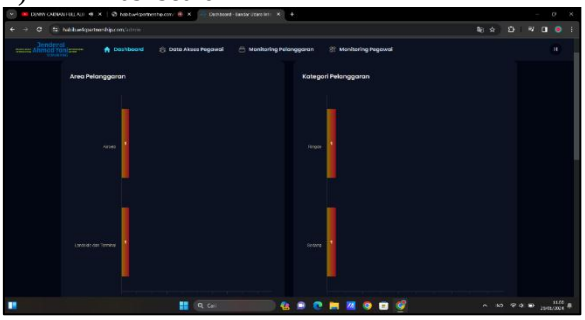

Figure 4.3 Dashboard Page View

4.1.4 Product Feasibility Validation Stage

The product feasibility validation stage is a stage to assess the Core Security application as a website-based record of airport pass holder violations that have been designed before the application will be tested to respondents, namely experts

a. Validation of Design Experts

Table 4.1 Design Validation results by Design Expert Validators

No.	Aspek Penilaian	Persentase	Kriteria
1.	Tampilan	90%	Sangat Layak
2.	Pewarnaan	95%	Sangat Layak
3.	Huruf	90%	Sangat Layak
4.	Gambar	95%	Sangat Layak
Rata-rata		92,5 %	Sangat Layak

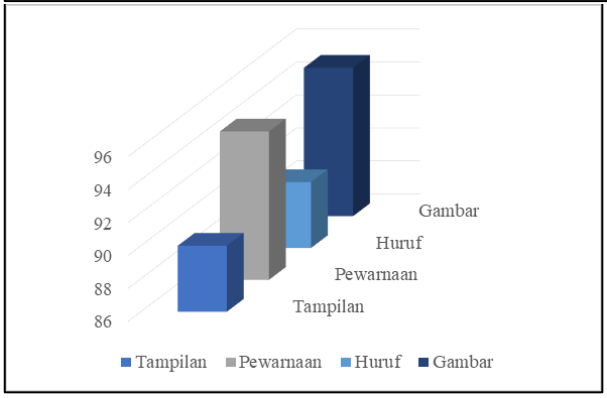

Figure 4.4 Graph of Design Expert Validation Results

b. Validation of Material Experts

Table 4.2 Results of Material Validation by Material Experts

No.	Aspek Penilaian	Persentase	Kriteria
1	Keterlaksanaan	70%	Layak
2	Kemudahan Penggunaan	85%	Sangat Layak
3	Isi Konten	75%	Layak
4	Kebahasaan	80%	Sangat Layak
Rata-rata		77,5%	Layak

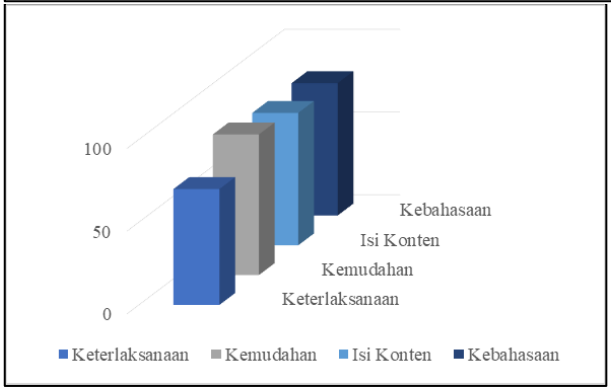

Figure 4.5 Graph of Material Expert Validation Results
Validator Assessment Results

Table 4.3 Validator Assessment Results

No.	Hasil Penilaian Validator	Hasil Skor
1	Validasi Ahli Desain	92,5%
2	Validasi Ahli Materi	77,5%
Rata-rata		85%

Based on the results of validation conducted by experts, before product improvements, the Core Security application obtained an average assessment percentage of 85% with the category of "Very Feasible".

4.1.5 Product Repair Stage

In the product improvement stage, at this stage the author makes improvements to the Core Security application as a form of evaluation of the criticism and suggestions given by the validator, the author makes revisions to the application as a form to correct the shortcomings contained in the Core Security application system.

Table 4.4 Revised Results

No.	Revision	Before	After
1.	The menu to add employee data can only be done gradually. Added a feature to add employee data on a large scale	Nothing	Exist
2.	The information form regarding the details of the violation specifications is not yet available in the violation registration sub-menu. An information form regarding the specification of the violation and photo evidence of the violation is added to the violation registration sub-menu.	Nothing	Exist

4.1.6 Product Trial Stage

The data below is the result of the trial phase that has been approved by the Aviation Security Team Leader and obtained based on an assessment questionnaire derived from the opinions and suggestions of Aviation Security from representatives of each squad.

Table 4.4 Application Trial by Aviaton Security Squad Personnel

No.	Respond	Indicator	Score					Opinions & Suggestions
			1	2	3	4	5	
1.	Personel *Aviation Security* Regu *Alpha*	Performance					✓	A camera option has been added to the *QR Code scan page*, because if you use the front camera, you may not be able to focus
		Facilities				✓		
		Necessity					✓	
		Functionality					✓	
		Efficiency					✓	
2.	Personel *Aviation Security* Regu *Bravo*	Performance				✓		Suggestions for the application, hopefully continue to be developed and still maintain the privacy of the data in the application
		Facilities				✓		
		Necessity					✓	
		Functionality				✓		
		Efficiency					✓	
3.	Personel *Aviation Security* Regu *Charlie*	Performance				✓		The app is already good. My suggestion is to add a feature that clarifies the place and occurrence of violations.
		Facilities				✓		
		Necessity				✓		
		Functionality					✓	
		Efficiency					✓	
TOTAL SCORE		68						90,6%

Based on the assessment of the questionnaire given by the representative of the Aviation Security squad of Jenderal Ahmad Yani Semarang Airport which was randomly selected on the level of satisfaction with the use of the Core Security application, an average score percentage value (68/75) x 100% = 90.6% was obtained with the category "Very Feasible".

4.1.7 Product Revision

The result of the revision of the Core Security application is carried out so that the performance of the application can be optimized, the result of the revision that has been carried out is the addition of a camera selection option feature so that users can choose the camera option used to scan the QR Code located at the airport pass, this is done to facilitate the use of the application by users and increase the speed of the QR Code scanning process. The revisions made can help improve the process of recording violations of airport pass holders to be smoother and more responsive.

4.2 DISCUSSION OF THE DRAFT

After the trial stage of the Core Security application, receive input and suggestions from users on the running of the application, then the author revises the application to suit the needs of the user, then re-tests to check each feature contained in the application with the aim of testing whether the application runs well or needs revision in line with the research [9]

4.2.1 *Black Box Testing*

Black Box Testing is a testing method in which system test results are observed using test data to check the functionality of the software that has been designed [14]. There are several testing activities in Black box testing that are carried out, including QR Code Scanner, Login User, Menu Dashboard, Menu Data Akses Pegawai, Menu Monitoring Pegawai dan Tombol Sign Out. From the results of Black Box Testing, it can be concluded that all testing activities are declared valid.

4.2.2 Application Access Testing Using Browser Links

Testing is carried out as a test tool to find out whether the application is running or not or still needs revision [9]. Application testing through a browser link to ensure that the Core Security application can be accessed on desktop or mobile with a predetermined browser link.

Based on the test results, the website-based Core Security application was successfully tested using a browser link. The Core Security application can be accessed using smartphones and computers, this makes it easier for Aviation Security personnel at Jenderal Ahmad Yani Airport Semarang to access the Core Security application.

5 CONCLUSION

Based on the stages that have been carried out on the Core Security application, the results of research and discussion have been obtained which show that the results of the Core Security application trial that has been carried out on Aviation Security personnel of Jenderal Ahmad Yani Airport Semarang received an assessment score of 90.6% with the Very Feasible category, with the assessment that has been obtained showing that the Core Security application can be applied at Jenderal Ahmad Yani Airport Semarang as a support for order airport pass holder personnel and improve the security culture. Based on the results of validation by design experts and material experts, an average percentage score of 85% was obtained with the category of "Very Feasible", with this category it can be concluded that the Core Security application is very feasible as a support for the order of airport pass holders and to improve the security culture at Jenderal Ahmad Yani Airport Semarang.

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