

# ANALYSIS AND DESIGN OF WEB-BASED AERONAUTICAL COMMUNICATION OFFICER (ACO) RATING TEST

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## Abstract

At the JATSC Branch of Perum LPPNPI, the rating test is held using the Google form which is easier to implement compared to paper-based, but the scores are still processed manually, and the collection of documents required for extending the rating is still through different media. The purpose of this research is to develop the analysis and design of the ACO Performance Check website which is used as a medium for performance checks for rating tests at the JATSC. To handle the constraints obtained from the existing test rating system, this website was built through research using the Goal-Directed Design method which focuses on user goals and experience. This research took 6 stages, which are Research, Modeling, Requirement Definition, Framework, Design Refinement, and Support. To measure the feasibility of using the website, a trial used the WEBUSE (Website Usability Evaluation Tools) approach as a usability evaluation method. This method will focus on testing the usability, value, convenience, and preferences of the website for the user experience in using it. The results of this study are the usability level obtained from website testing including the Content, Organization & Readability category with Excellent level, the Navigation & Links category with Good level, the User Interface Design category with Excellent level, and the Performance & Effectiveness category with Excellent level. In conclusion, the development of the analysis and design of the ACO Performance Check website has fulfilled the user's goals and wishes as a performance check media for rating extension.

**Keywords:** Performance Check, License, Website, Goal-Directed Design.

## INTRODUCTION

The provision of services in the world of aviation is always a highly safe mode of transportation. In part, this has come about as technological advances have improved aircraft, navigation systems, and air traffic control. There have also been significant advances in relevant ergonomics and in aircrew training and practices [1]. One important factor is the flight personnel with high quality standards in providing services within their knowledge and abilities. Aviation personnel always maintain the quality of service by following performance checks which are carried out within a certain period. It is related to Crew Resource Management that is the species of the genus Human Resource Management which has been defined as: "a set of processes, which – through the recruitment, training, motivation, appraisal, reward, and development of individuals, and through the effective handling of industrial relations - translates strategy into action" [2].

Aeronautical Communication Officer (ACO) in an Air Traffic Service/ATC Unit has a rating that is valid for one year from the date of approval. According to PM 87 of 2021 concerning Licenses, Ratings, Training and

Proficiency of Flight Navigation Personnel subpart 69.A no 69.025 "the rating of flight communication guide personnel and aeronautical information services is valid for 1 (one) year from the date of ratification of the rating;". [3] The procedure for issuing/extending the rating includes evaluating the fulfillment of administrative requirements, conducting the rating exam, and announcing the results of the rating exam [4]. Personnel carry out performance checks for rating extensions by passing practical and theoretical tests carried out by checkers who have been appointed by the Director of Aviation Navigation. One of the crucial things that must always be maintained is the personnel's phraseology during their radiotelephony communication with pilot. Phraseology, which is used in the majority of cases of communication in this context, is a language consisting of a restricted repertoire. This means that the language needed is strictly controlled and standardized. [5]

The implementation of flight communication performance checks in each unit has a different method according to the condition of the unit. Starting from the peer-based method to applications used to carry out rating extension tests while continuing to carry out exams

honestly and reliably so that the results obtained can become personnel competency standards. The minimum score limit to be declared eligible is 70 percent of the exam questions, and if participants are declared not to pass they can take part in a re-check a maximum of 1 time.

Aeronautical Communication Officer (ACO) at JATSC uses an online exam method based on google form and quiziz. Considering the number of Aeronautical Communication Officers (ACOs) at the JATSC, many online examination methods can shorten time and reduce paper usage, this is good enough for personnel and checkers. However, several upgrades can be applied to its implementation. Over the past three years, the collection of administrative requirements is still being sent via e-mail, WhatsApp, or soft-files using a flash drive to checkers separately, where there is a risk that the files are not stored properly or even lost. Assessments on Google form or quiziz must also be processed in advance by the checkers so that new personnel will know whether or not they have passed the exam after the checkers give the announcement of the overall exam results. [6]

This research is intended to create and implement a website for carrying out performance checks at the JATSC, from collecting administrative requirements, and debriefing, to conducting exams. A website is a collection of interconnected pages in which there are several items such as documents and images stored on a web server (Vermaat, Sebok, Freund, Campbell, & Frydenberg, 2018). [6] The emergence of the network society as a new social form has greatly impacted how people access and consume information. Websites are the information portals of online society, and recently, the number of websites on the Internet has exceeded 2 billion. [7] [8]

This website assists checkers in processing and collecting data as well as personnel values in carrying out performance checks so that the implementation can be carried out systematically with regular data storage without disturbing established procedures. The main elements of the website include:

- a) Domains. A domain is a unique address or name used to identify a website on the internet, consisting of a unique domain name and a domain extension such as .com, .org or .net
- b) Hosting. Is a server where the website will be stored and can be accessed via the internet. This hosting determines whether this website will run quickly and stably.
- c) Programming language. Special languages used to create this type of software include websites such as HTML, CSS, JavaScript, PHP, or CMS (WordPress, Joomla, and Drupal). [9]

CMS are software platforms with strong ability, flexibility and extensibility, considered as one of the most important Information and Communication Technologies (ICTs) in managing organisations' information and knowledge [10] [11]. CMS are applied when a website is needed, commonly requiring different user roles in a situation when programming knowledge is missing [12] [13] [14], [15]. The group of the most prominent ones includes WordPress (WP). [16] [17] [18]

Wordpress is an open-source content management system platform, which means developers can modify the platform. Wordpress is divided into two, including WordPress.com, which is a website builder platform from WordPress which also provides domains and hosting, and WordPress.org: a WordPress CMS platform provider that can be downloaded and installed for free, but users must subscribe to hosting and get a domain at another provider. [19]

To run the website according to the needs of ACO in carrying out performance checks, the appropriate system for the rating performance check exam is the Learning Management System (LMS). Learning Management System (LMS) is software designed to create, distribute, manage the delivery of materials, and assess learning and development processes.

The adoption of a variety of online technologies has given rise to a worldwide e-learning expansion, opening up possibilities for new forms of engagement and inviting innovative pedagogy. With the introduction of e-learning in education, learning management system (LMS) has been a crucial platform enabling e-learning technology to support various synchronous and asynchronous learning activities, such as accessing high-quality and different formats of learning materials, providing multiple types of interactive features, and recording student participation and performance. [20]

In this study, researchers will use the Goal Directed-Design research method. Goal Directed-Design is an interface design or development model that focuses on goals and user experience. [21] The development process is carried out by modeling the user persona on the user, scenario context, and domain. The flow of this research method is research, modeling, requirement, framework, refinement, support. The following 6 phases have included major collaboration points including designers, management, and technologies that provide the key to success in designing a product, and also include design issues [22] [23]

Researchers used the Website Usability Evaluation Tools (WEBUSE) method for testing websites. This method is a website-based application usability evaluation method which is a combination of existing evaluation tools such as WAMMI, WebSAT, Bobby, and Protocol Analysis. This test will focus on the categories Content, Organization & Readability, Navigation &

Links, User Interface Design, and Performance & Effectiveness [24]. Aspects that will be the main concern in testing are:

- a. Aspects of Usability, with the aim that users can feel the ease, comfort, and speed of use.
- b. Aspects of Value (Valuable), where the available features are adjusted to the wishes and uses.
- c. Aspects of convenience, the website must be easy to apply.
- d. Aspects of Likes, users must like and feel interested when accessing the website, not monotonous and interactive. [25]

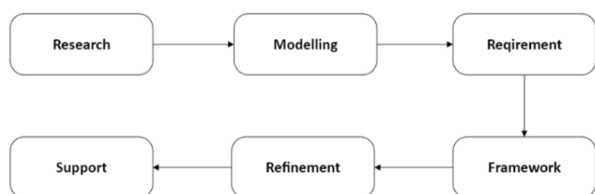
Based on the narration background above, the formulation of the problem that can be taken is:

1. How is the application and use of the website regarding the processing and announcement of exam results in the implementation of performance checks for the extension of the Aeronautical Communication Officer (ACO) rating exam at JATSC?
2. How is the application and use of the website related to the process of collecting administrative requirements for the extension of the Aeronautical Communication Officer (ACO) rating at the JATSC?
3. Does the application and use of the website affect the effectiveness of the implementation of performance checks both from the checkers and personnel side?

## METODE

### Research design

In this study, researchers will use the Goal Directed-Design research method. Goal Directed-Design is an interface design or development model that focuses on goals and user experience.



**Figure 2.1** Goal-Directed Design Research Method

In Figure 2.1 above, the research flow is explained using the Goal-Directed Design method, each stage of which is explained as follows.

- a) Research. Is the data collection phase that can be carried out by interviews, observations, questionnaires, literature studies, recording the

activities of respondents, to obtain qualitative and quantitative data of users.

- b) Modeling. This phase produces a persona which is a user representation that will describe specific things such as activities, user goals, constraints, and user needs. This persona will later act as the object of the approach in building the design.
- c) Requirements. The phase needed to determine what needs are needed by each persona. It is at this point that the need to balance the user, business, and engineering needs of the design scenario is a scenario context.
- d) Frameworks. At this stage, we will design interactions between frameworks using visual tools to explain elements of existing functions such as application wireframes from context scenarios, which are used to provide an overview when users interact with the system.
- e) Refinements. In this phase the researcher will build an application design related to the appearance of the user interface, user experience, and other supporting information.
- f) Support. The last stage is evaluating and testing the interface design that has been made. [26]

## Instrument Design

### Design

Both Checkers and Personnel will have a personal account to use the website. Checkers will have access to compile, create, and publish content or material on the website which has 5 main features, namely access to SOP, LOCA, and Regulations, Requirements Collection page, Exposure Page, Theory Test Page (Rating Examination), and Test Results or Exam Results.

Meanwhile, personnel can access these contents and features after the content is published by the Checker and fulfills the conditions set. Checkers can arrange when personnel can access published content, so checkers can first consider whether personnel meet the requirements by uploading the required documents. Checkers can check uploaded documents while withholding presentation materials and exam questions until the personnel meets the requirements, only then do personnel have access to the next stage..

## Instrument Works

How the website works will be divided according to the predetermined user persona, namely from the Instructor/Checker and personnel side.

#### a. Use by checkers

Website usage from the Checker side are carried out in detail as follows.

- 1) Checkers enter materials such as SOP, LOCA, and Regulations to be accessed by the Aeronautical Communication Officer (ACO). In addition, checkers can upload video meeting links and presentation materials as well as questions that will be used for theory exams.
- 2) Checkers can set the time for each session starting from uploading the required documents by the Aeronautical Communication Officer (ACO), downloading the uploaded documents can be accessed on a predetermined page. The checker determines the date of presentation of the material along with access to the page of the presentation session after the personnel has validated the document requirements.
- 3) Checkers set the date for the theory exam and publish the questions so that they can be accessed according to the specified time. Checkers can give an opportunity to re-examine Aeronautical Communication Officer (ACO) who fail once.
- 4) Data on the results of the rating exam can be downloaded on a predetermined page to then be reported to the Director of Aviation Navigation

#### b. Use by personnel

Website usage from the Personnel side each stage is carried out with the flow as follows.

- 1) Registration personnel use personal e-mail.
- 2) Personnel access SOP, LOCA, and regulations that have been provided.
- 3) Personnel access the required document collection session and upload the required documents in the column provided.
- 4) Personnel can access the exposure page after uploading documents and according to the date set by the checker.
- 5) The theory exam is carried out according to the date it was held, personnel can only access this page after uploading documents and following the presentation.
- 6) Exam results will be immediately displayed on the screen with details sent to the personnel's personal e-mail. Personnel who do not meet the passing grade may submit a re-examination to the checkers at least once.

## Instrument Components

In making this website supported by the tools used to get the desired results.

#### a. Hardware

The hardware used in this study includes laptops/PCs and their devices as the main media for creating websites that are accessed via a browser, mobile phones which also play a role as media in making websites other than PCs, flash drives as a medium for transferring data and documents needed in making websites and research, as well as modems as internet sources in making websites and research.

#### b. Software (Software)

Researchers are assisted by the application of several software including Wordpress as a CMS which is the basis for website creation, for LMS researchers use LearnPress provided by ThimPress, Elementor as a plugin that helps researchers realize the design into an applicable website. In terms of appearance, researchers use Canva to create designs, logos, and other media that beautify the appearance of the website. Researchers use the Zoom application to provide video meetings in presentations, as well as Microsoft Office to provide and access the required documents in various existing formats (PowerPoint, MicrosoftWord, MicrosoftExcel, and others).

## Testing Techniques

Researchers used the Website Usability Evaluation Tools (WEBUSE) method for testing websites. Testing of the website will be carried out based on User Experience in accordance with predetermined user personas, namely Instructor/Checker and Aeronautical Communication Officer (ACO) where testing will focus on perceptions and responses to the website and its systems.

## Data Analysis Techniques

Process analysis techniques for searching data, systematically compiling data obtained from interviews, field notes, and documentation by organizing data into categories, describing them into units, carrying out synthesis, compiling into patterns choosing which ones are important and which will be studied, and draw conclusions so that they are easily understood by themselves and others. [27]

In this study the authors obtained data from research results during field practice and existing literature. Data collection techniques for website usage will be carried out using the Website Usability Evaluation Tools (WEBUSE) approach. Researchers will collect data using a questionnaire that will be distributed to

respondents. This questionnaire will be answered using the answer choices as below.

**Table 2.1.** [28] Merit in the Answer Choices

Merit	Answer
0.00	Strongly Disagree
0.25	No/Disagree
0.50	Neutral
0.75	Agree
1.00	Strongly agree

The results of the merit questionnaire answers will be calculated based on 5 answers. Usability points for each category are obtained from the mean of each category with the following formula:

$$x = \frac{[\sum(\text{Merit for each question on the category})]}{[\text{Number of Questions}]} \quad (3.1)$$

The overall usability point of the website is determined from the mean usability points of the four categories. The higher the usability point, the higher the usability level of the website [28], as illustrated and explained in table 2.2.

**Table 2.2.** Relationship Usability Point and Usability Level

Poin, x	$0 \leq x < 0.2$	$0.2 \leq x < 0.4$	$0.4 \leq x < 0.6$	$0.6 \leq x < 0.8$	$0.8 \leq x < 1.0$
Level Usability	Bad	Poor	Moderate	Good	Excellent

## RESULT AND DISCUSSION

### Research Result

#### Analysis

##### Running System Analysis

The system used for the rating test is the media google form or quiziz to replace the manual system, namely paper media. This system makes it easy for both checkers who do not need to print large numbers of questions, as well as personnel who do not need to fill in answers manually. Implementation can also be done anywhere and anytime, without requiring a special room. However, there are still a number of problems with the current system, including the processing of test scores manually and the collection of documents required for rating extensions sent via personal media such as WhatsApp, e-mail, or via flash drives. So that it is necessary to improve the system for implementing rating exams by using

media or platforms that can cover all the needs and objectives of checkers and personnel to conduct tests. In this case the media that is suitable for carrying out performance checks is a website that can accommodate administrative requirements for extending the rating of personnel or examinees, storing and managing examinees' test scores for later export to assessment data as a whole, and facilitating personnel or examinees as media. to follow the presentation of the material as well as access to SOP, LOCA, and regulations that are still in effect.

The processing of the ACO rating test scores at the JATSC is carried out after all personnel have completed the exam, by entering data on the scores of personnel or examinees one by one into Microsoft Excel. The theory rating exam is carried out in two days, according to the personnel's service schedule. Examinees do not immediately know the value obtained, because the overall test results are distributed when the test scores of all personnel have been obtained. The process of entering value data into Microsoft Excel carries the risk of errors in the data collection, in which there is a possibility that one personnel's value data is confused with other personnel. Personnel or examinees also cannot immediately know the value obtained.

In carrying out the rating test, personnel are given one opportunity to re-check if the scores obtained do not meet the specified standards. Personnel can apply for a re-check when the scores have been announced which determine whether or not the exam is passed. This should be shortened if the personnel already know the results of the exam to immediately schedule a re-examination to the checkers. This system will also minimize the risk of schedule conflicts between checkers and personnel.

In addition, the collection of documents required for rating extension is sent via personal media such as Whatsapp, e-mail, or via flash media. This is quite confusing for checkers in checking the completeness of the required documents from personnel or examinees. There is also a risk that the document requirements of one personnel are confused with other personnel. So a container is needed to store the entire personnel requirements document so that it is not separated and confused.

The current state of the system is running according to existing regulations, but the above constraints are still obstacles in its implementation. Considering the relatively large number of ACOs at the JATSC, one data error can affect other data. This is also an obstacle because it is part of the ACO workload for both checkers and personnel in terms of manpower and time. So that media is needed to overcome these obstacles so that the implementation of performance checks, especially in

processing value data and requirements documents, can be carried out effectively, efficiently and systematically.

### 1) Flowchart of the old system from Checker

The flow of the performance check implementation system from the checkers can be seen in Figure 3.1 below.



**Figure 3.1** Running System Flowchart From Checker

From the flowchart above, the performance check implementation uses the old system from the checker's side starting with the checker having to collect the required documents, prepare and present material before the exam, then prepare and review questions with relevant material. After all are ready, the checkers will determine the time and place of the exam, oversee the course of the exam, manage scores, and make a submission to the Director of Aviation Navigation for an extension of the personnel rating and submit the required documents and exam results.

### 2) Flowchart of the running system from Personnel

In Figure 3.2, the flow of performance checks by personnel or examinees is illustrated.



**Figure 3.2** Running System Flowchart of Personnel

To apply for a rating extension, personnel must submit the complete rating extension requirement documents consisting of an application letter, license book, application form, medical certificate, ILP certificate, competency certificate, and ACO personal logbook. After all requirements are met, the personnel will be given a presentation of the material by the checkers and wait for the exam schedule to be determined. After the date and place of the exam is announced, personnel must be present on time and carry out the exam according to regulations. Examination results will be announced after being processed by the checkers, for examinees who do not meet the passing grade, they can re-check and schedule a re-examination to the checkers.

### Proposed System Analysis

To overcome the obstacles in the previous system, a performance check system was needed to extend the rating using one medium that could assist the implementation of both checkers and personnel. A website is needed that can be used for submitting, supplying, rating exams, and processing grades for extending the ACO rating. Through this website, all personnel can carry out performance checks on just one website. On this website, personnel and checkers each have an account that will be used to access the website during the performance check process. Some of the main features offered on this website include Profile, Material, Group video calls, Collection of documents, Rating Exam, and Exam Results

In this system, users of the website are divided into two types of users, namely Checkers and Personnel (Exam Participants). The role of each user in using the website is explained as follows.

#### a. Checker

Checkers are in charge of coordinating the implementation of performance checks on the website

- 1) Uploading the latest SOP, LOCA and Regulations.
- 2) Prepare the media for the collection of requirements.
- 3) Uploading the presentation material before the exam.
- 4) Prepare exam questions.
- 5) Manage time and publish exams.
- 6) Processing test scores.

#### b. Personnel

On this website, personnel or examinees can follow each flow after having an account and completing the required documents.

- 1) Access SOP, LOCA, and Regulations that have been provided by the Checker.
- 2) Upload the required rating extension documents.
- 3) Following the presentation of the material.
- 4) Take the rating exam.
- 5) Get details of test scores.

### Comparison of the Old System and the New System

The following is a comparison of the application system for extending the ACO unit rating at the current JATSC and the ACO Performance Check website.

**Table 3.1.** Comparison of the Old System with the New System

ACO Unit Perum LPPNPI JATSC Branch System	ACO Performance Check Website System
<ol style="list-style-type: none"> <li>1) Personnel collect administrative requirements via whatsapp or email.</li> <li>2) Personnel follow debriefing.</li> <li>3) Personnel take the exam after taking attendance.</li> <li>4) The personnel waits for the exam results to come out, after which the personnel can re-test if the score is insufficient.</li> </ol>	<ol style="list-style-type: none"> <li>1) Personnel collect administrative requirements in the given column.</li> <li>2) Personnel follow the debriefing at the appointed time.</li> <li>3) Personnel take exams where the results can be seen immediately after completing the exam questions, and can immediately apply for a re-examination if the score is insufficient.</li> </ol>

### Design

#### Research

The researcher understands the Aeronautical Communication Officer (ACO) performance check implementation system at the JATSC by observing the implementation of the performance check and studying the literature as a guide in its implementation.

##### a. Study of literature

The first data and information collection technique that the researchers carried out was through reading written sources such as regulations that apply to countries and also internationally as well as SOPs that apply in related units. In addition, researchers also look for sources from other units, such as SOPs, as a comparison in the system and its implementation. Researchers also collect sources in the form of previous studies related to performance checks and website development as references. From this literacy study, researchers received guidelines, references, and comparisons of implementation systems as provisions for conducting

research and development in implementing performance checks at the JATSC.

##### b. Observation

Researchers made observations during the implementation of the Aeronautical Communication Officer (ACO) performance check at JATSC, especially the theory rating test for the Aeronautical Fixed (AF) rating which was held on December 6 2022. The performance check implementation began with collecting the rating extension requirements that were sent to the checker, after which the personnel will follow the exposure which has been determined by the date and place. After going through the previous stages, the personnel will take the theory exam prepared by the checkers. In its implementation, the collection of requirements uses Whatsapp media, e-mail, and flash drives.

### Modelling

At this stage the researcher will identify users through activities, user goals, constraints, and needs which are the results of the research stage to then be classified into one or more user personas.

##### a. User Personas

The researcher divides the types of users, namely Checkers (exam organizers) and Personnel (exam participants). Checkers as user 1 have the goal of being able to use a website which will become a medium or platform for gathering requirements, presentations, theoretical exams, and grade management in just one place so that the implementation of performance checks can run systematically and easily.

Personnel (Exam Participants) need a website that can be a medium for gathering requirements, attending presentations, theoretical exams, and knowing test results directly with the aim of being able to take performance checks easily and quickly.

##### b. User Flow

This stage will explain the flow which contains the process of how the user will use the website for performance checks. The flowchart for using this website will provide an overview of the user's steps in accessing the website, both Checkers and Personnel Flowcharts for using the website can be seen in Figure 3.4 with the following explanation.

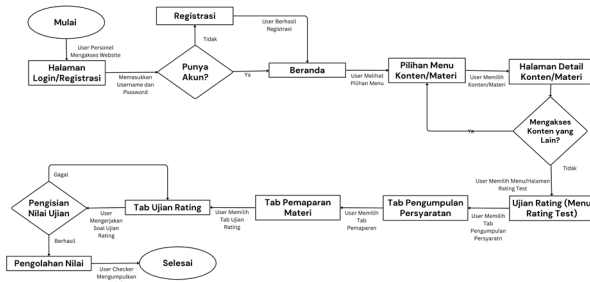


Figure 3.4 User Flow Website ACO Performance Check

Requirement Definition

In its implementation, the author will create a scenario context and Hierarchical Task Analysis (HTA) based on the results of the modeling stage. The researcher ensures that the user can achieve the goal with an activity plan that is defined from the user flow that has been made.

a. Scenario Context

Contains user scenario questions with fictitious characters created to carry out tasks so that they can be understood easily and clearly.

b. Functionality Requirements

Here the researcher describes the function of each feature and menu on the website.

Table 3.2. Functionality Requirements

No	Needs	Description
1	Requirements Document Collection Feature	Used for personnel in uploading documents and checkers in their grouping.
2	Provisioning Features	Used for personnel to gain access to links and materials in the exposure.
3	Rating Exam Feature (Quiz)	Used to facilitate personnel in notifying value and Checkers in processing and storing values.
4	LOCA, SOP, and Regulation	Used as a source of information on the latest regulations and provisions as personnel and checkers.
5	Home Menu	Used to display all content and material that will help the rating performance check test take place.

c. Hierarchical Task Analysis (HTA)

The researcher will make a Hierarchical Task Analysis (HTA) based on the context of the scenario for identification and depiction of features to determine what steps are needed to achieve user goals. This Hierarchical

Task Analysis (HTA) is in the form of a flow structure arranged to form a tree diagram. Hierarchical Task Analysis (HTA) of the website describes the flow of each of the main features. Each feature is built to flow towards the desired usability goal starting from accessing the website's landing page.

Framework

At this stage a wireframe or low-fidelity is created which is based on the previous steps as the overall conceptual design of the website interface design. This wireframe will contain a layout, content space, button locations, and typography.

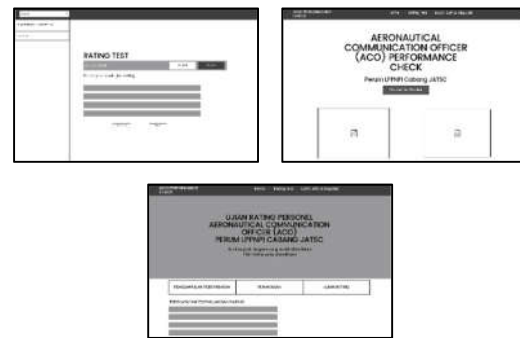


Figure 3.6 Website Page Wireframe

Design Refinement

This stage focuses on developing the appearance of the website such as colors and typography. Starting from the design guideline so that the components displayed have a visual guide with the aim of having a consistent website appearance.



Figure 3.7 Design Guidelines

The specified design guideline for this website can be seen in Figure 3.7 above. This design also aims to provide characteristics and character, to be more recognizable and to be able to represent the agency with the website itself.

Support

To test the usability of this website, Researchers prepared a Website Usability Evaluation Tools (WEBUSE) Questionnaire to obtain results in quantitative form which were divided into four categories. This questionnaire was distributed using the Zoho Form media to respondents who had been divided into two users, namely Checkers and Personnel (Exam Participants) with a website usage guide (user scenario)



included and socialization using zoom media. The following are the results of the questionnaire that has been calculated.

**Table 3.4.** Website Trial Questionnaire Results

Kode	Jumlah	Mean	Level
K1_1	13	0,87	Excellent
K1_2	13	0,87	Excellent
K1_3	11,5	0,76	Good
K2_1	13,25	0,88	Excellent
K2_2	11	0,73	Good
K2_3	11,75	0,78	Good
K3_1	12,75	0,85	Excellent
K3_2	11,25	0,75	Good
K3_3	13,25	0,88	Excellent
K4_1	11,75	0,78	Good
K4_2	13,25	0,88	Excellent
K4_3	12,25	0,82	Excellent

Furthermore, the calculation of the average or mean value of each category of questions determines the usability point as a reference for the usability level of the website.

**Table 3.5.** Usability Points and Usability Levels

Kategori	Poin Usability	Level Usability
<i>Content, Organization and Readability</i>	0,83	<i>Excellent</i>
<i>Navigation and Links</i>	0,79	<i>Good</i>
<i>User Interface Design</i>	0,82	<i>Excellent</i>
<i>Performance and Effectiveness</i>	0,82	<i>Excellent</i>

From the calculation of the website test results above, it can be seen that based on user experience among other categories, the Navigation and Links category most needs improvement.

## Discussion of Research Results

Researcher has observed, designed, and built a simple website but with as detailed information and features as possible so that it can be used by users according to their goals and uses. In this study, there are two user personas, namely Checkers and Personnel (Exam Participants). By paying attention to the timeline for implementing performance checks, researchers arrange existing

features and content to make it easier for users to access the website.

With the Goal Directed Design research method, testing on the website is based on and aimed at the design desired by the user. The trial was carried out using a media questionnaire based on the Website Usability Evaluation Tools (WEBUSE) method which was categorized into four categories, namely Content, Organization & Readability, Navigation & Links, User Interface Design, and Performance & Effectiveness.

Based on the tests that have been carried out, the researcher received several notes, namely the placement of the Dashboard menu for checkers is not visible because it is too small, the marking feature for questions that have or have not been answered is not yet available, the Request as Checker button is not visible or read clearly by the user because the color is not clear, and a dashboard display for checkers that can be simplified.

The rest of the notes above received a positive response from respondents. The display of questions is quite clear with values that appear immediately when the user finishes taking the exam, the required features and menus function properly, such as columns for collecting requirements documents, exposure links, and rating exam options. The website works quickly, the appearance of the website is not monotonous, the links and buttons work properly by not taking the user to a different page with clear descriptions, instructions and descriptions given, and clear page descriptions.

The features for processing and announcing exam results can be implemented properly and fulfill the four categories tested. The display of the rating test scores is immediately displayed clearly and in detail after the user has worked on the questions, the scores are directly entered into the database, the instructions are displayed clearly, and the contents are in accordance with what is required.

The collection of administrative requirements for extending the rating can be used on pages that have been made, the instructions are considered clear, the send button is visible to the user and functions, the document is stored in the database, and the columns provided are in accordance with the stipulated conditions.

From the test results, the usability level obtained includes the Content, Organization & Readability category with Excellent Level, the Navigation & Links category with Good Level, the User Interface Design category with Excellent Level, and the Performance & Effectiveness category with Excellent Level. With this test the result is that the ACO Performance Check Website can be accessed by both users according to their needs and uses which later can become a medium for

carrying out performance checks in an effective, efficient and systematic manner.

This website can be used as an ACO performance check media in accordance with existing requirements and conditions. However, this website has problems in data storage security. For this reason, the method of collecting the document requirements for rating extension is carried out by uploading the latest requirements document files to be deleted by the Checker when the performance check is completed in order to avoid leaking personal data of personnel and important files that are personal and confidential. Because of this, the accounts of the two users do not need to complete their personal data. The data used to access accounts on this website are only names and personal e-mails.

## CONCLUSION

Researchers found several obstacles that could be improved to assist checkers and personnel in carrying out rating tests. Because the implementation of the theory test is carried out using Googleform, processing scores requires quite a lot of time in collecting data. In addition, the collection of separate requirements documents is at risk of being lost and disorganized. For this reason, the design of the ACO Performance Check Website is intended to assist the implementation of the exam so that it can be held and managed systematically.

In the website testing conducted based on the experience of the respondents, it was found that this website is in accordance with the goals and wishes of users, both checkers and personnel from the four categories. Some of the features and content provided include gathering requirements, presentation, rating exams, access to LOCA, SOP, and Regulations, as well as data processing and test scores can run well.

Suggestions that can be conveyed from this Final Project research are that the ACO Performance Check website is expected to be maintained and maintained in a sustainable manner, because this website is not only used by the Aviation Communications Unit but can be applied to other units. Starting from security enhancements, storage optimization, to hosting and domain extensions so you can continue to use them safely. In addition, this website needs to be improved from time to time according to the times and technology so that it remains relevant. It is hoped that this research can become a reference for future researchers so that it can continue to be perfected and developed.

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