



Design AFSI APPS (Airport Flight Service Information) as an Android-Based Air Transport Information Application

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Abstract. Air transport has become the primary mode of connecting global regions, supporting international trade, cultural exchange, and economic growth. Data from Indonesia's Central Statistics Agency (BPS) shows a significant contribution of the transportation and warehousing sectors to the country's GDP, reaching IDR 208.52 trillion in the first quarter of 2022, with the largest growth occurring in air transportation at 53.2% from the previous year. However, the rapid growth in the aviation industry has also increased the need for accurate and timely information regarding aviation. Unfortunately, there are often communication problems where passengers still experience delays in check-in and boarding, which has the potential to hamper flight operations. To overcome this problem, Airport Flight Service Information (AFSI) comes as a solution that integrates various features and information related to flights and airports and provides a holistic flight experience. AFSI APPS consists of six main features, namely ticket search and booking, flight reminders, baggage tracking system, language translator, weather monitor, and an interactive airport guide in the form of a virtual tour. This study applies the R&D methodology of the Waterfall model by Pressman (2015), which is currently in stage 3 of 5 stages. The output of this research is in the form of a design from AFSI APPS, which needs to proceed to the next stage for further implementation. AFSI APPS is expected to help passengers overcome potential problems during the trip, provide relevant information, and provide necessary guidance so that air travel is more enjoyable and efficient.

Keywords: AFSI APPS · app design · service information · virtual tour · waterfall

1 Introduction

Aircraft have become a very important means of transportation in connecting different regions around the world, facilitating international trade, supporting widespread cultural exchanges, and significantly promoting economic growth [1]. Data released by the Central Statistics Agency (BPS) shows that the transportation and warehousing sector in Indonesia has a very large contribution to the country's gross domestic product (GDP). In the first quarter of 2022, this sector reached a GDP of around IDR 208.52 trillion, with the fastest growth occurring in the field of air transportation, which

increased by 53.2% from the previous year.

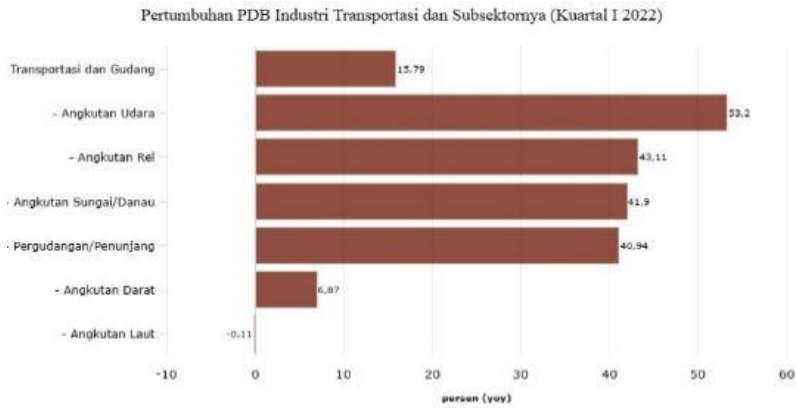


Fig. 1. Industrial GDP Growth Transportation

In line with the rapid growth in the aviation industry, the demand for accurate and timely flight information is increasing [2]. Information about flight schedules, arrival status, and departures is very important for passengers. Unfortunately, there are still frequent obstacles in communication, where passengers often do not know the right time to check in and board, which can disrupt flight operations [3]. To solve this problem, researchers aim to design AFSI APPS (Airport Flight Service Information), an Android-based air transport information application that is relevant and useful. So that passengers will be easier and more punctual in accessing important information related to their flights.

In previous research, it was found that the design of an android-based urban public transportation information system [4] and the design of an android-based public transportation information application in Surabaya [5]. There are also applications such as [traveloka](#), [tiket.com](#), and [flyhub](#) that provide flight ticket sales, lodging, and flight information services. However, what distinguishes AFSI APPS is the integration of these features into one comprehensive application, covering flight information, airports, and the overall flight experience.

AFSI APPS is an Android-based application that offers a wide range of services, including ticket search and booking, flight schedule reminders, baggage trackers, language translators, weather monitors, and interactive airport guides in the form of virtual tours. The app allows passengers to easily search and book tickets, receive important flight schedule reminders, track baggage, communicate efficiently, monitor weather conditions, and virtually explore the airport before their arrival.

The result of this research is the design of AFSI APPS, which aims to improve the air travel experience more smoothly, informatively, and comfortably for passengers. The app is expected to help passengers overcome potential problems during travel, provide relevant information, and provide the necessary guidance to make air travel more enjoyable and efficient. Thus, AFSI APPS is expected to provide significant added value in the world of air transport.

2 Research Methods

This research applies research and development (R&D) methodology to achieve a predetermined level of quality [6]. In this context, the R&D methodology applied is a waterfall model in software development. The waterfall model used in this study follows structured stages, referring to the five stages described by Pressman (2015), which include:



Fig. 2. The Waterfall Method by Pressman (2015)

Waterfall method This research is limited to the third stage, namely:

2.1 Communication Stage

At the communication stage, involves determining the title idea through observation, survey, and search and analysis of various ideas to be incorporated into the design [7]. This stage involves the collection of information. Regarding the problem and needs through literature study, observation, and survey with questionnaires related to constraints faced when using air transport

2.2 Planning Stage

At the planning stage, researchers develop a basic plan for applications that will be designed to be solutions to existing problems [8]. This includes a root-cause analysis of the current situation and AFSI mind-map planning.

2.3 Modelling Stage

This stage involves the analysis and design required in software development [9]. At the time of designing software, important aspects such as data structures, interfaces, and logarithmic details must be represented before starting to write code. At the modeling stage, the steps taken include designing AFSI APPS flowcharts, creating AFSI APPS interfaces using the Unity platform, and utilizing various supporting software such as SketchUp, C# programming language, and Corel Draw to design the appearance of AFSI APPS.

3 Results and Discussion

This research resulted in the design of AFSI APPS through an efficient and effective

process. The initial stage involves communication, literature study, observation, and surveys to understand the obstacles that are being faced today. Followed by planning and modeling, including designing the AFSI APPS interface on the Unity platform and designing the appearance of AFSI APPS using Corel Draw and the C# programming language.

3.1 Communication Stage

1. Literature Study

In journals previous, such as [5], [4], [10], [11], [12], [13]–[17] it can be concluded that There is an opportunity to develop Apps that can combine Various features and related information flights and airports, to provide a comprehensive flight experience.

2. Observation and Survey

In the process of observation, identification of differences and development potential that can be found in flight ticket sales, lodging, and flight information services that already exist on the [Traveloka](#), [tiket.com](#), and [FlyHub](#) applications As for the survey, data collection is carried out through the distribution of questionnaires in the form of Google Forms to users of transportation modes in Palembang City.

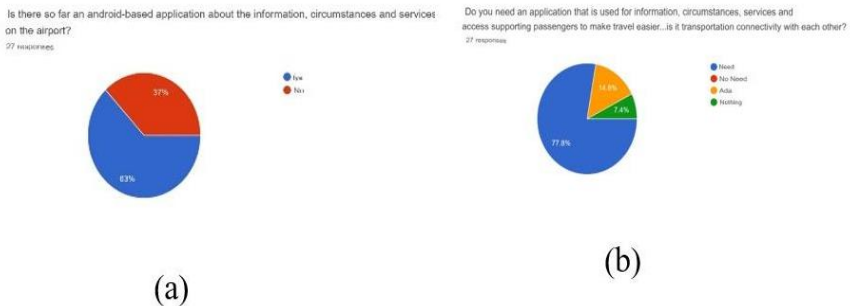


Fig. 3. (a) Survey Result First Question, (b) Survey Result Second Question

From Figure 3 (a), it is known that 63% of respondents stated that they were not aware of any application that provided information, conditions, and services related to airports. From Figure 3 (b), 77.8% of respondents revealed the need for an application that can provide information, circumstances, services, and access that can support passengers during their journey.

3.2 Planning Stage

1. Root Cause Analysis

The planning stage is carried out by making a root-cause analysis in the form of a fishbone analysis. Fishbone analysis is used to carefully investigate existing problems, discrepancies, and gaps, to identify various relevant root causes of problems [18]. Through the use of fishbone analysis, we can find the root cause of the problem in a structured manner, and this will help in determining the direction of the research

objectives. The following is the fishbone analysis applied to AFSI APPS:

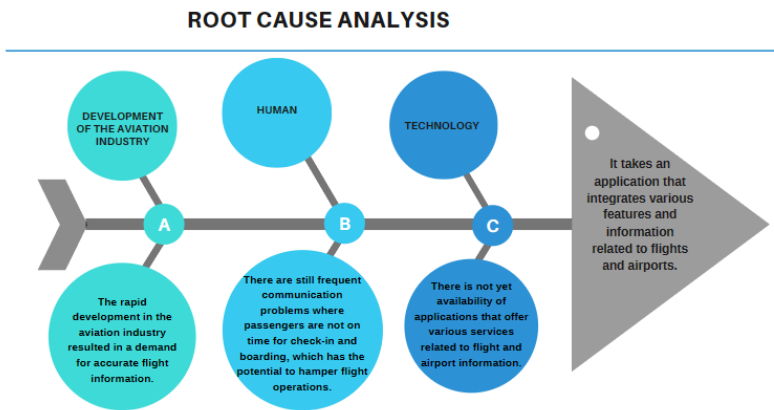


Fig. 4. Fishbone Analysis AFSI APPS

2. Mind-Map

A mind map was created to visualize the basic development concepts of AFSI APPS [19]. This mind map will help in describing the key steps to be taken in the development of AFSI APPS and how the elements are interrelated to achieve the desired goals. By using this mind map, it can be seen the structure of the AFSI APPS development plan and its relationship with the predetermined stages.

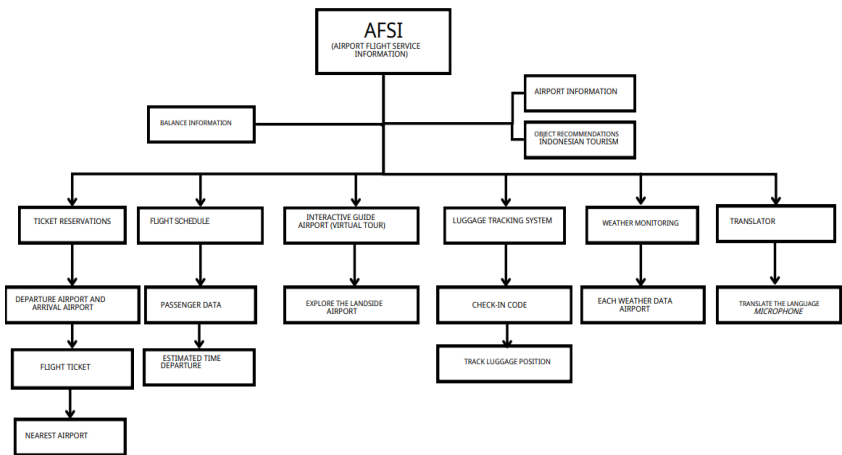


Fig. 5. Mind-Map AFSI APPS

3.3 Modelling Stage

Use case diagrams are created as representations of several interactions between components contained in AFSI APPS to describe the main functionality of a system as well as illustrate their relationship or interaction with the system [20]. Users can access the main menu, which consists of six menu options ticket reservation, flight schedule, interactive airport guide (virtual tour), luggage tracking system, weather monitoring, and translator.

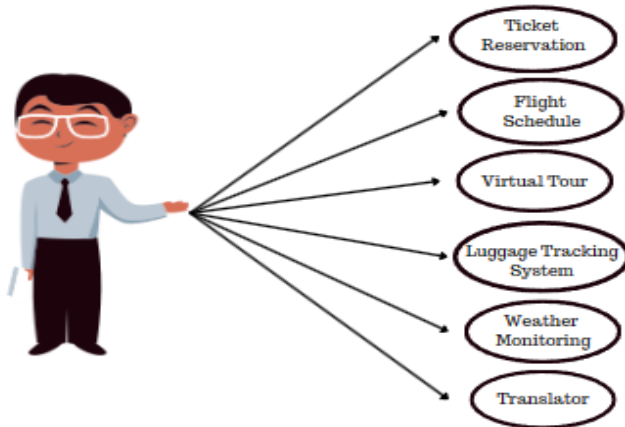


Fig. 6. Use Case Diagram in AFSI APPS

1. Flowchart

A flowchart contains an activity diagram that illustrates the workflow of a system or menu in a piece of software [21]. Here's the proposed AFSI APPS flowchart:

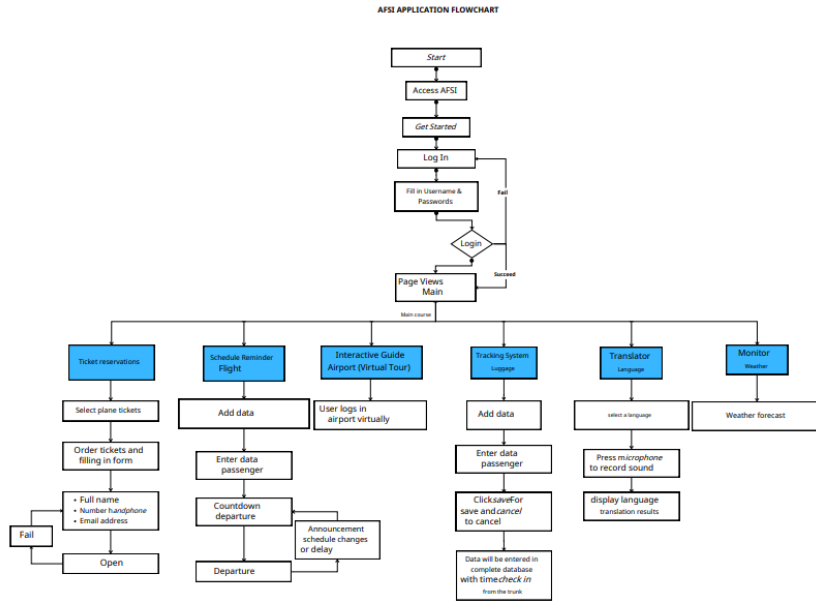


Fig. 7. Flowchart AFSI APPS

2. Interface

The AFSI APPS interface is designed in 3D models using SketchUp and then further developed through the Unity gaming platform. The following is an interface from AFSI APSS:



Fig. 8. (a) AFSI APPS Initial View, (b) AFSI APPS Login View, and (c) AFSI APPS Main

Page View

The main page of the AFSI APPS app displays the starting point that users see when opening the app. Here, there is a menu of options, airport information, and recommendations for attractions that support Indonesian tourism, including new destinations and super-priority tourism agendas.



Fig. 9. Ticket Reservation

In the flight ticket reservation feature, users can search for tickets with various filter options, such as price, flight time, airline, and connectivity. Information required for booking includes destination origin, departure and return dates, number of passengers, flight details, and seat selection. This application also provides convenience in the fast and secure payment process, as well as sending order confirmations to users.



Fig. 10. Virtual Tour Area Landside Airport

AFSI APPS has the main feature of an interactive airport guide in the form of a virtual tour that provides a map of terminals, gate locations, restaurants, rest areas, and other facilities at the airport. This feature allows passengers to explore the airport virtually before their arrival while also providing estimated security and immigration queue times based on flight times. Thus, AFSI APPS not only enhances the comfort of passengers upon arrival at the airport but also helps them plan their trips with accurate

and relevant information.

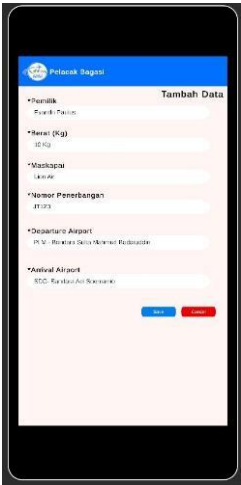


Fig. 11. Luggage Tracking System

The luggage tracking system serves to ensure the suitability of passenger or cargo baggage with the flight number concerned. This baggage tracking system allows passengers to easily check if their baggage has reached its correct destination, both during transit and upon arrival. In addition, the system notifies passengers when baggage has arrived or been received, complete with up-to-date location information. Thus, passengers can monitor the movement of their baggage to and from the airport more efficiently and more conveniently.



Fig. 12. Weather Monitoring

AFSI APPS provides weather information features that help passengers know weather conditions, such as heavy rain, so they can anticipate certain situations. In addition, AFSI APPS also provides personal transportation booking services, such as online transportation services, and promotes integration with other means of transportation available at the airport.



Fig. 13. Translator

AFSI APPS has features multilingual, which is useful for international users and tourists who want to explore attractions in Indonesia. This is in line with the development of integrated transportation technology and aims to promote tourism destinations in Indonesia.

4 Conclusion

AFSI APPS is an Android-based air transportation information application that has significant relevance and benefits. This application has been designed to solve communication problems in air travel by integrating various features and information related to flights and airports and providing a comprehensive flight experience. Key features provided by AFSI APPS include ticket search and booking, flight schedule reminders, baggage trackers, language translators, weather monitors, and an airport interactive guide. In its development process, AFSI APPS adopts a research and development (R&D) methodology with a waterfall model, which is currently in the third of five stages outlined by Pressman (2015). This stage results in the design of AFSI APPS, which then needs to proceed to the deployment stage so that it can be widely used and provide benefits as to where it was created. Thus, AFSI APPS is expected to be an effective solution to improve a more comfortable and efficient air travel experience.

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