

Analysis of the Digital Information System for Passenger Information Services at Sultan Thaha Airport, Jambi

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ABSTRACT

The increasing number of passengers at Sultan Thaha Jambi Airport triggers the need for faster and more accurate information services for passengers. One of the digital information systems used at Sultan Thaha Jambi Airport is the Flight Information Display System (FIDS), which is managed through an internal website by airport information officers. This research aims to analyze the factors that cause FIDS to not provide maximum service to passengers, identify what features need to be added to the website system, and examine the integration of the Flight Information Display System (FIDS) with the Public Address System (PAS) and Automatic Announcement System (AAS). This research uses a qualitative descriptive method with data collection techniques through observation, documentation, and interviews. The results of the study show that the main obstacles lie in data input errors by officers, delays in updating flight information by officers, less legible FIDS displays, and unstrategic screen locations. In addition, the absence of integration between FIDS and PAS makes the information between visual and audio not simultaneous. In conclusion, the FIDS system needs to be improved through officer training, development of real-time dashboard features, and automatic integration with PAS and AAS to improve fast, accurate, and user-friendly information services.

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INTRODUCTION

Air transportation is known for its high speed and ability to reach various locations, including areas that are difficult to reach by other types of transportation. Therefore, this mode of transportation is the main choice for many people [1]. With the significant increase in the number of passengers every year, especially during peak seasons such as Christmas, New Year, and Idul Fitri holidays, Sultan Thaha Airport Jambi continues to strive to improve service standards for service users. In accordance with the Minister of Transportation Regulation Number 178 of 2015 concerning Airport Service User Service Standards, Article 2 paragraph 1, the service standards set forth in this regulation include service standards for prospective passengers and passengers at the airport terminal. This service standard applies from the time of entering the service area as a service user in the departure area until exiting the service area in the arrival area. The standards include facilities used during the process of departure and arrival of passengers, facilities that provide comfort for passengers, and the capacity of the airport terminal to accommodate passengers during peak hours [2].

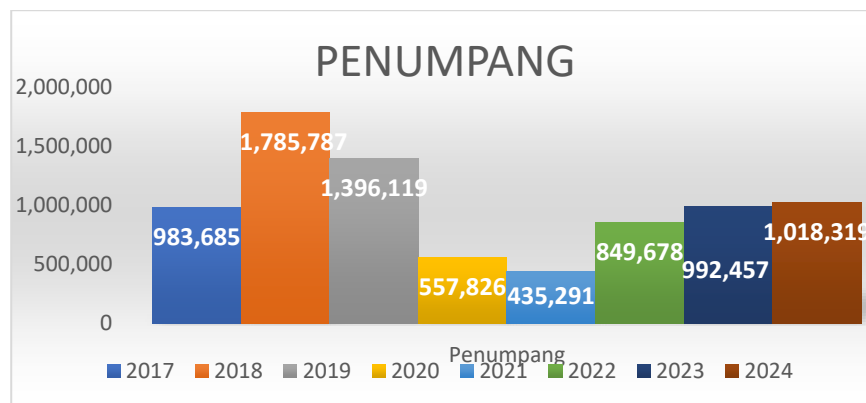


Figure 1 Traffic Data of Sultan Thaha Airport Jambi Year 2017-2024

One important aspect of passenger comfort is the availability of accurate and easily accessible information. This information can be provided through two methods: manually by officers and digitally through systems such as the Flight Information Display System (FIDS). FIDS is a digital flight information system that plays a crucial role in delivering real-time information to passengers, such as flight schedules, boarding times, baggage claim, and other announcements. This system not only displays information but also serves as a communication medium that supports a fast, accurate, and efficient user experience. This aligns with Minister of Transportation Regulation No. 41 of 2023, which emphasizes the importance of quality, affordable, and measurable public services [3]. The absence or inefficiency of FIDS has the potential to cause various problems, such as passenger confusion, delays, and a degraded airport image.

Digital Information System (DIS) is the core of modern business, enabling organizations to collect, store, manage, and analyze data to support decision making and improve operational efficiency. In an age where data is considered a highly valuable resource, understanding the various components of DIS is crucial for any business that wants to stay competitive. Digital information systems play an important role in today's business operations, providing the necessary tools to harness the potential of data. By understanding and optimizing each component, businesses can improve efficiency and drive sustainable growth [4].

Based on research conducted by Yuliana [5] at Kualanamu Airport in Medan, the results show that the airport has implemented the concept of a smart airport, passengers want technological innovations and real-time flight information facilities to help them at the airport. These facilities include facilities for monitoring baggage, check-in processes, and flight schedules. And according to Octavia and Andi [6] identify the use of FIDS at Kualanamu airports, there is obstacles that arise in its use and the solutions applied to overcome these problem. This research shows that some obstacles encountered

in the use of this FIDS at Kualanamu Airport include unsynchronized data information, which was resolved through coordination with Apron Movement Control (AMC) units, as well as lack of FIDS screen facilities.

At Sultan Thaha Airport in Jambi, the Flight Information Display System (FIDS) is operated through an internal website accessible only to information unit officers. However, based on observations during the author's On the Job Training (OJT), this system is deemed not to be functioning optimally. Several problems found include errors in data entry, displays that are too small for passengers to read, damage to the FIDS unit, less strategic placement locations, and the system not being integrated with other devices such as the Public Address System (PAS) and Automatic Announcement System (AAS). Based on these various obstacles, this study aims to identify factors that cause FIDS information services to be less than optimal, determine features that need to be added to the system, and analyze the need for FIDS integration with other information systems to improve the quality of information services to passengers. Based on the background above, this study is titled : " Analysis of the Digital Information for Passenger Information Services at Sultan Thaha Airport, Jambi".

METHODS

This study applied a qualitative descriptive approach to analyze digital information system for airports, the author focuses on the Flight Information Display System (FIDS) digital information system services for smooth information and operational services to passengers at Sultan Thaha Jambi Airport. Furthermore, factors that support and cause difficulties for passengers in finding the necessary information are further reviewed based on literature and previous research relevant to the research written. This method selected to gain in-depth into digital information services which is in this research is FIDS.

Research Design

This study uses a qualitative descriptive method to provide an in-depth description of the digital information service phenomenon through the Flight Information Display System (FIDS) at Sultan Thaha Airport in Jambi. Data collection techniques include observation, documentation, and interviews. Observations were conducted when author was doing on-the-job training at the landside terminal unit. Interviews were held with personel from information officers, customer service personel, aviation security, passengers, and airport electronics officers. Documentation reviewed included FIDS facilities, FIDS website system, FIDS screen display, passenger queues at check-in counters. This multi-source design helpen triangulate data for accuracy and reability.

Research Variables

- a. Independents Variable (X): Accuracy and speed of flight information updates, screen display design and readability, place,ent and availability of FIDS units at airports, features on the FIDS website, performance of information officers in operating FIDS
- b. Dependent Variable (Y): Passengers satisfaction with flight information services, ease of access to information, airport operational efficiency, synchronization of visual (FIDS), and audio (PAS and AAS) information.

Data collection technique

- a. Observation: Direct observation during OJT of the use of FIDS
- b. Documentation: Field photos as visual evidence
- c. Interviews: Semi-structured with information officers, customer service, passengers and technical staff.

Data Validity

The validity of the data was tested using triangulation techniques using various data sources (observation, interviews, documentation) to increase the credibility and validity of the results.

Data Analysis Techniques

The analysis was carried out descriptively qualitatively, by grouping the data into themes and patterns, then presented in narrative form based on the results of observations, interviews, and documentation.

Place and Time of Research

The research was conducted at Sultan Thaha Jambi Airport while the author was participating in On The Job Training (OJT) for approximately five months.

Gap Analysis

Previous study such as Putra et al. (2020) and Octavia and Andi et al. (2024) Discussing digital information services has a strong connection to passenger satisfaction. Passengers want information that is easily accessible and real-time so that they feel comfortable. This study also identifies the obstacles that prevent digital information services, namely FIDS, but lacked specific analysis of airports- level operational constraints. This study fills that gap by focusing on STAJ's environmental conditions and the phenomena that occur.

RESULT AND DISCUSSION

Sultan Thaha Airport in Jambi currently uses the Flight Information Display System (FIDS) as a digital flight information service for airport passengers. This system displays real-time data regarding flight schedules, flight numbers, departure gates, airline information, flight status, and baggage claim information. This digital information system in the form of FIDS is installed at several strategic points in the airport such as waiting rooms, check-in areas, and arrival areas. The information displayed on the Flight Information Display System (FIDS) screen that is seen by passengers through the screen, the information is operated and managed by the information unit officers at the airport through a dedicated website to operate the FIDS system.

FIDS Website

No	Flight No	Flight No Pair	Status	Action
1	IU 376	IU 377	Active	Action
2	GA 126	GA 127	Active	Action
3	SI 7228	SI 7229	Active	Action
4	ID 6802	ID 6803	Active	Action
5	SI 7225	SI 7223	Active	Action
6	GA 128	GA 125	Active	Action
7	JT 608	JT 609	Active	Action
8	Q6 906	Q6 907	Active	Action
9	ID 6804	ID 6805	Active	Action
10	IU 840	IU 841	Active	Action

Figure 2 Website Image for Managing FIDS Display

The FIDS website is the main control panel used by information officers at Sultan Thaha Airport in Jambi to manage and update the content displayed on FIDS screens in various areas of the airport. This website can only be accessed by authorized officers through the internal network by logging in with a username and password. This system enables real-time flight data updates, so that updated information immediately appears on the FIDS screens. However, the system's effectiveness depends on network speed, the accuracy of the data entered, and the readiness of the officers. Some of the main features of the FIDS website include:

- Login page: To access the system, officers must enter an account and password.
- Display Template: A feature for customizing the FIDS screen layout, rarely used except by IT personnel.

- c. Master Pairing: Contains a list of airlines and flight numbers active at the airport, used as a reference for data input.
- d. View Aircraft Flight Schedule (AFS): The main feature used daily to update flight information. It includes:
 - 1) Flight number & pairing: Manages arrival and departure number pairs.
 - 2) LEG Cat and City: Displays the flight category and origin-destination city.
 - 3) STAD, ETAD, ATAD: Displays scheduled, estimated, and actual arrival/departure times. B
 - 4) aggage Claim: Must be updated according to the baggage conveyor number for passenger convenience.
 - 5) Remark: Used to update flight statuses such as boarding (GBD), delay (FDL), landing (FLD), etc.
 - 6) Action: A core feature for storing and displaying all flight information changes on the FIDS screen.

Factors that cause fids to not be able to provide maximum information services

Information officers are professionals who deliver information directly or indirectly and play a vital role in airport schedule management. Their performance is crucial to service quality, as accurate information significantly impacts decision-making and user satisfaction [7] .

FIDS management is carried out by officers through data input on the website as explained above. However, field observations revealed errors in data entry, such as aircraft status, departure/arrival times, gate numbers, and delays in updating check-in desk status. These desks should open two hours before departure to allow passengers to check in and drop off their baggage on time.



Figure 3 Fids screen display on Desember 4, 2024

- a. In the observed image, the departure information for Citilink QG967 has not been updated on the FIDS screen even though the time is 3:04 PM and the scheduled departure time is 3:50 PM. Information about the check-in desk opening should have been displayed because the time is past the 2-hour limit before departure. This delay in updating confused passengers, created queues, and increased the workload of officers due to many passengers asking questions directly.
- b. Furthermore, the text and images on the FIDS screens, particularly for gate information in the waiting area, are too small, making them difficult to read from a distance. Passengers must move closer to read the information, which can reduce efficiency, especially for those in a hurry. This contradicts the primary function of FIDS, which is to provide information quickly and easily. While ICAO Annex 14 does not specifically regulate display sizes, the IATA ADRM provides technical guidelines regarding readability, such as a font size of 75–100 mm for a reading distance of 25 meters, contrast, and display position. Airports typically adjust FIDS displays based on passenger flow and effective viewing distance to ensure accessibility and user comfort.
- c. Several FIDS screens were damaged and malfunctioning. The FIDS screen located in the lobby area near the passenger drop-off/drop-off area, and the FIDS screen in the boarding lounge area , were not lit. This can limit passengers' access to real -time flight information in these areas . This condition can reduce the effectiveness of information services at the airport and potentially cause confusion for passengers, delays, and increase the workload of airport information officers. In addition to FIDS failures, the strategic location of the FIDS is also important. At Sultan Thaha Airport in Jambi, the FIDS in the departure gate area is installed in the middle of the entrance lane,

often causing congestion or obstruction of passenger traffic flow. According to [8] proper location is crucial to ensure the FIDS functions optimally in providing easily accessible flight information to passengers and airport staff, thus supporting smooth operations and the comfort of airport service users.

Development of Digital Flight Information Display System (FIDS) Information System Features

Based on interviews and analysis during On-The-Job Training, digital information services at airports, particularly through the Flight Information Display System (FIDS), still face various obstacles and are unable to provide optimal information services to passengers. These obstacles are related to the FIDS system itself, the role of information officers, and limited supporting facilities. The lack of effective communication from the airport regarding the importance of digital information also exacerbates the situation, leading to confusion, inefficient passenger flow, and decreased satisfaction and the airport's image among service users. Some features that can be added to support digital information services include :

a. Real-Time Dashboard for Officers

To improve the efficiency of digital information services, the proposed solution is the development of a real-time dashboard feature in the officer information system. This dashboard allows for a live, centralized, and automatically updated display of flight data, making it easier to monitor without opening multiple windows. This feature also provides notifications for changes such as delays or cancellations. Its advantages include work efficiency, high accuracy, rapid response, and potential integration with other systems such as public address systems. However, it has drawbacks such as network dependence, the need for officer training, high development costs, and the potential for errors if synchronization with airline data is not optimal. Here is a *real-time dashboard display design* and a diagram of its workflow for information officers:

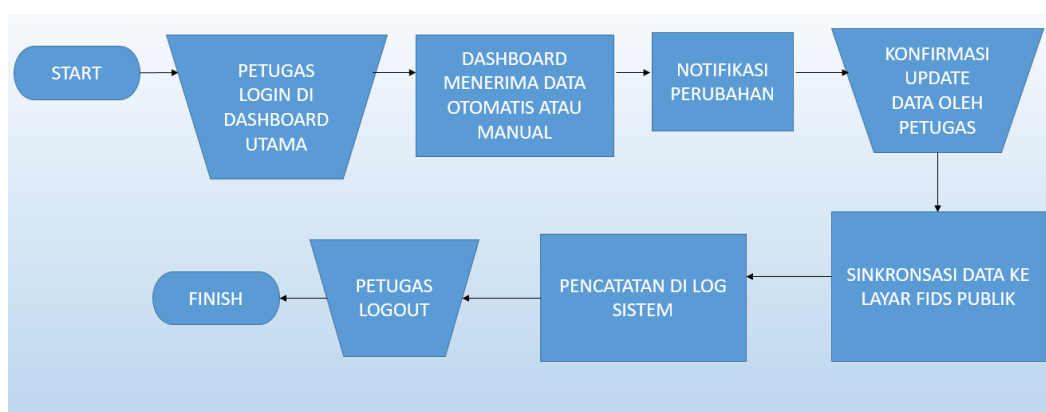


Figure 5 Dashboard real-time flow-charts

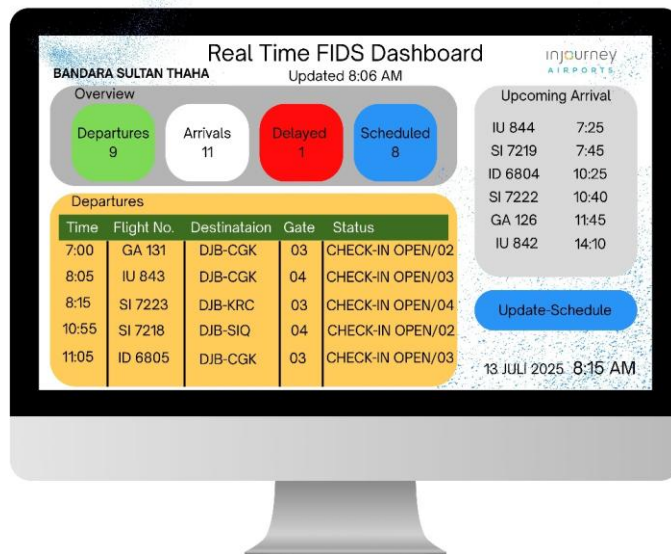


Figure 6 Design Real-time Dashboard

b. Additional information display on the FIDS screen

As a strategic step to improve the quality of digital information services at Sultan Thaha Jambi Airport, the next proposed solution is to add information in the form of check-in desk numbers and operating hours to the Flight Information Display System (FIDS) screen. This step is considered important because many passengers, especially tourists and visitors from outside the region, experience confusion and have to ask officers for the location and opening hours of check-in desks. This not only causes inconvenience but also has the potential to cause long queues at the inspection area and check-in counters due to simultaneous passenger arrivals. Adding information to the FIDS is considered not to require complex system changes, simply by inputting data when filling out the daily flight schedule by officers via the dashboard or website. This information can be inserted next to the flight status column, such as "Check-in open: Desk 1". However, there are disadvantages such as the need for additional display space, regular information updates, and the potential for distraction from the main information. However, the advantages of this innovation are very significant, including providing more complete information, reducing queues and confusion, and increasing service efficiency without the need for additional equipment.

Below is a screenshot of the departure information screen on the FIDS screen and the additional information design for FIDS:



Figure 7 (a) Current FIDS screen view for departure information (b) 1 design of FIDS screen display information

c. Automatic notification of schedule updates

Observations and interviews revealed that the Flight Information Display System (FIDS) screens frequently experienced delays in updating when there were schedule changes, delays, gate changes, or flight cancellations. This situation led to confusion and complaints from passengers, and reduced the quality of digital information services at the airport.

The proposed solution is to implement *automated notifications* to remind staff to promptly update FIDS information. This system can be built simply and inexpensively using Google Calendar, Google Sheets, or messaging bots like Telegram/WhatsApp, making it ideal for small airports.

The use of automated notifications in the FIDS system has advantages such as improving officer discipline, reducing negligence, and can be implemented inexpensively using a free platform. This system also helps deliver flight information in a timely manner. However, its disadvantages include dependence on an internet connection, the need for officer training, and the risk of notifications being overlooked if not properly integrated into official workflows.

d. Adjustment of the size, layout of display content, and placement of the FIDS screen

Adjusting the size, content layout, and placement of FIDS screens is crucial for improving readability and passenger comfort in the departure terminal. Small font sizes, inappropriate screen placement, and disproportionate information displays are all contributing to passenger confusion and complaints. Therefore, changes are needed, such as the use of large fonts, high color contrast, and clear airline images for easy readability from a distance. Screen placement must also consider passenger flow and safety aspects, for example, by mounting them on walls or hanging them above pedestrian walkways to avoid obstructing mobility. This solution has been implemented at several major airports, such as Juanda Airport.

The advantages of this adjustment include improved readability, easier access to information for all passengers, including those with limited time or vision, and more structured information delivery. However, the disadvantages include the cost of upgrading equipment, redesigning the interface, and the risk of confusion due to inconsistent design and layout.

Integration of Flight Information Display System (FIDS) with Public Address System (PAS) and Airport Announcement System (AAS)

Currently, the digital flight information system at Sultan Thaha Airport in Jambi is still operated separately between FIDS (Flight Information Display System) and PAS (Public Address System). PAS and AAS (Automatic Announcement System) are a single entity, PAS is a system that regulates information delivered audio, while AAS is a system that functions so that information is delivered automatically directly from the FIDS system. The Automatic Announcement System (AAS) is a system designed to deliver automatic announcements whenever there is a change in the flight schedule in the Flight Information Display System [9]. FIDS is used to display flight information visually through digital screens, while PAS is used to deliver information audibly through loudspeakers at the airport. Although both aim to provide information to passengers, these systems are not yet technically integrated. As a result, every time there is a change in the schedule or gate, officers must first update the data in the FIDS system, then manually re-enter the same information into the PAS system or make an announcement directly through a microphone. This dual processing often results in a lack of synchronization between the information displayed on the FIDS screen and the information heard over the loudspeaker. For example, information about a flight delay due to weather or a change in boarding gate information on the FIDS screen may be delayed in its transmission via the PAS because the officer hasn't re-entered the information into the PAS system to convey it over the loudspeaker. In busy airports or when a flight is suddenly delayed due to weather, this can confuse passengers and increase the risk of passenger complaints to the airport. Therefore, an integrated solution is needed between FIDS and PAS so that the two systems can work automatically and seamlessly without relying on duplicate input by officers.

With the integration of FIDS and PAS/AAS, every information update on the FIDS system can be directly linked to the automatic voice announcement system. For example, if the flight status for Garuda Indonesia flight GA 127, bound for Jakarta, changes from "Boarding" to "Final Call," the FIDS system will send a command to the PAS to play a pre-programmed voice recording or automated text. The result is faster, more consistent information delivery across all airport communication channels, both visual and audio, so airport users no longer have to rely on FIDS screens for schedule changes. This integration also reduces the workload for information officers, eliminating the need to update two systems separately. Officers simply update flight data in FIDS, and the system automatically adjusts the display changes on the FIDS screens and broadcasts announcements over the airport loudspeakers. With

the integration of FIDS, PAS, and AAS, digital information services at Sultan Thaha Airport in Jambi can be more integrated, responsive, and user-friendly, strengthening passenger confidence in the professionalism of airport services.

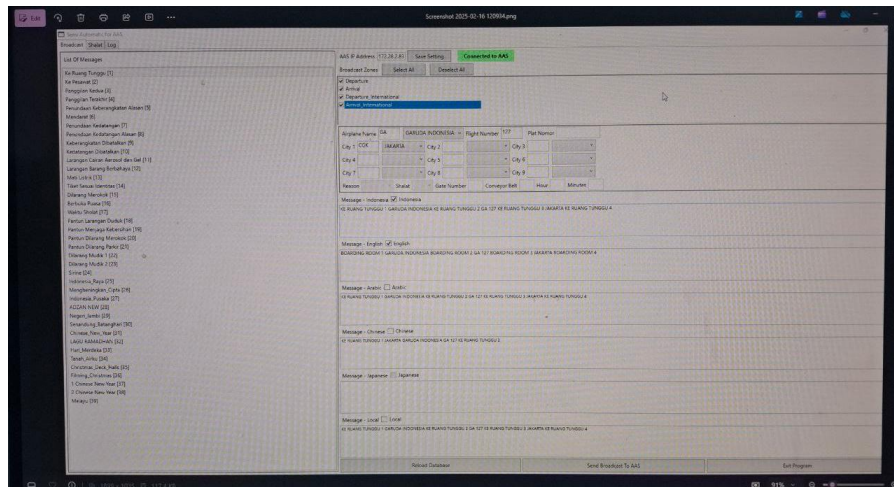


Figure 8 operating system that has not been integrated with FIDS and AAS Conclusion

Based on the background and problem identification described above, so that the discussion of this study does not expand and is directed, the problem in this study is limited to the digital information system for passenger information services, namely the Flight Information Display System at Sultan Thaha Jambi Airport.

The Flight Information Display System (FIDS) at Sultan Thaha Jambi Airport has not been able to provide maximum information services to passengers because several screen units are damaged, there are limited features on the FIDS website system, the screen display is less efficient and easy to read, the FIDS location is less efficient, FIDS has not been integrated with the Public Address System (PAS) and Automatic Announcement System (AAS), and there are still errors and delays in manual input of flight information data by officers. The FIDS website system needs to add features such as an integrated real-time dashboard, automatic notification features as a reminder for flight data updates, additional information on the FIDS screen display, namely information on the check-in desk number and its operating hours.

The integration of FIDS with PAS and AAS is necessary to increase efficiency, reduce the workload of officers, and provide visual and audio information in harmony for airport service users. The integration of FIDS with the Public Address System (PAS) and the Automatic Announcement System (AAS) is very necessary so that every flight information update from FIDS is conveyed automatically via voice announcements on the PAS.

Further research is recommended to expand the scope, such as comparing the FIDS system used at Sultan Thaha Airport in Jambi with other airports that have implemented optimal information system integration. Research can also deepen technical aspects, such as directly testing the integrated system between FIDS, PAS, and AAS to determine its effectiveness in conveying information to passengers. Furthermore, further studies can include the perceptions of airport service users, both passengers and operational staff, to obtain a more comprehensive picture of information needs in the terminal area.

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