

DIGITALIZATION OF GLOBAL REPORTING FORMAT IN JUWATA INTERNATIONAL AIRPORT, TARAKAN

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Received :
29 May 2024

Revised :
24 June 2024

Accepted :
27 June 2024

Abstract: The global reporting format at Juwata International Airport, Tarakan, is still inefficient and uses too much paper. This study aims to make the global reporting format more efficient and avoid excessive paper usage. To address the above problems, the study digitized the global reporting format using a website as the platform for data entry forms, making them easier to fill out and more efficient. The Research and Development (R&D) method was used with an eye to produce certain products. The method underwent several stages, starting from the needs analysis stage to the evaluation stage to test the effectiveness and quality of the product. By doing so, the product can be used in the wider community. The results showed that the website allows users to fill in the data more efficiently. In addition, the website promoted paperless campaigns and can be used online. Based on the results of the above method, it is concluded that digitizing the reporting format is very efficient and does not use a lot of paper. Moreover, such reporting can store the recap of reporting results in order to back up and neatly organize the data.

Keywords: digitalization, efficiency, method, website

Introduction

This research was motivated by the researchers' personal observation while carrying out on-the-job training at Juwata Tarakan International Airport. The researchers encountered some problems in the building and runway units, especially facilities in the airside area. The researchers identified problems that are caused by the lack of effective and efficient global reporting format. It was observed that the data were still reported manually and that too much paper was used. Based on the existing problems, a new global reporting format is urgently required by digitizing the format reports into a digital file using a website platform. Thus, the processes of filling in and storing data are easier and faster.

One of the problems that the author identified was how the officers manually reported the presence of water on the runway at Juwata Tarakan Airport. The report began by measuring the height of the water coverage on the runway. The results were written on a reporting form, which would later be communicated to the navigation officer or Air Traffic Controller (Bylica and Pashkevich, 2023). In addition, the reporting activity can even be more challenging when it rains because the paper form becomes untidy and at risk of tearing during sampling. In short, the manual global reporting format is less efficient and will take a lot of time to complete.

Given this reality, it seems necessary to provide the right solution. While this reporting activity is considered less efficient, the officers should be able to take advantage of the rapid growth of technology. In this research, the Global Reporting Format reporting form is converted into a database that will be stored on the website. The stored data includes the reporting number,

the time of reporting the presence of water, the ICAO reporting code, the conditions at the time the report was made, and the height of the water coverage (Sama *et al.*, 2022). The database also recorded the time when the report was made, the height of water coverage on the runway, a description of the runway surface conditions due to contamination, and the officers who made the report.

Based on the above research problems, this study is limited in several ways. First, the study does not include runway layouts and damage in airside facilities (Brassard *et al.*, 2022). This website is used by officers to report the presence of water to the Air Traffic Controller. The website listed reporting procedures and stated global reporting formats for reporting officers on duty. Additionally, it does not discuss the OS (Operating System) system used by the website.

Method

This study employed a Research and Development (R&D) method. This method aims to produce certain products through several stages. The stages start from needs analysis to the evaluation of the quality of the product so that it can be used in the wider community. According to Sugiyono (2010), Research and Development research is a research method used to produce a specific product and test the effectiveness of the product.

Data Collection

The method for data collection was a direct observation as an insider. This method was chosen to determine the conditions of the global reporting format at Juwata Tarakan International Airport. This allowed the study to obtain the most efficient and effective method for making global reporting format reports. The results of direct observation are presented in Figures 1 and 2 (Baykov, 2020).



Figure 1. Results of the global reporting format

Figure 2. Reporting worksheets in the global reporting format

The global reporting format should be reported as efficiently and effectively as possible. The information should be delivered quickly to the air traffic controller so that the aircraft landing can be safer. In accordance with SE 15 of 2021, the information included in the global reporting format are ICAO Airports Code, date and time (according to UTC hours) of sampling, lower runway designator, RYWCC code, coverage of water inundation, deepest point of inundation (Iyad Alomar, D, 2023).

1. Advantages and Weakness of the GRF Website

One of the advantages of this website is that it is more efficient and faster in creating and sending reports. The data can be stored and organized well. In addition, it saves on paper usage, so it is more environmentally friendly. Another advantage is the flexibility since the report results can be viewed from the website, and the data can be printed anywhere. Regarding compatibility, this website can be used with all types of browsers, computers, and handphones.

Despite the superiority, there are still limitations that can hamper the website's performance. One of them is that it can only be used when the computer is connected to an internet network (online). This is a problem with this website because an internet network is needed to access it. Thus, an internet subscription or data plan is also needed so that the desired results are in accordance with the rules and regulations arranged in SE 15 Year 2021 And KP 326 Year 2019.

2. Diagram Channel System How to Report the Global Reporting Format (GRF)

a. Procedures for Reporting the Existence of Water

The procedures for reporting the presence of water are provided in Annex 14 Vol 1 and Vol 2. The report contains the date, hour, officer, and the information description.

b. Reporting Form

This form is used to report the presence of water on the runway. This form contains information about the date and time that occurs when carrying out inspections, the ICAO *code at* each reporting airport, runway conditions, height and percentage of water coverage on the runway. The form conveys the report to the Air Traffic Controller.

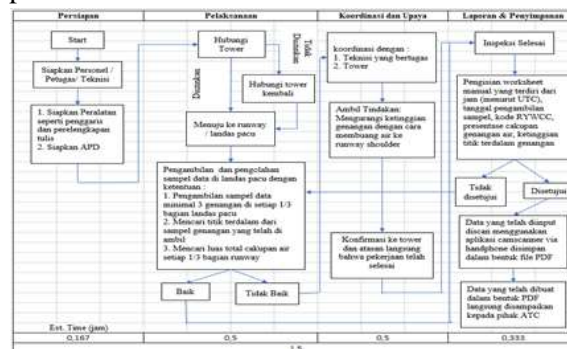


Figure 3. Flowchart of Reporting Procedures Using Manual

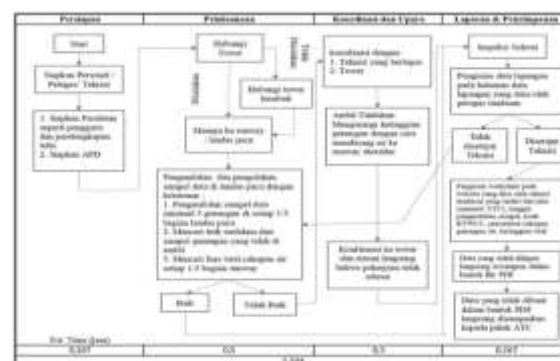


Figure 4. Flowchart of Reporting Procedures Using a Website

The Global Reporting Format website is a website-based reporting system designed by the authors. Technically, a GRF report can be made by accessing website <https://globalreportingformat.id> (Price *et al.*, 2014).

The comparison between the procedures of reporting manually and through websites is presented in Figures 3 and 4. Figure 3 notes the reporting procedures done manually. It shows that the GRF reports done manually using paper have several shortcomings that can affect effectiveness. On the other hand, the advantages of this website are that it can overcome the effectiveness problems and save time for ± 10 minutes (Gonçalves and Correia, 2015). This study designed the GRF website by surveying data and problems in the field and creating a page display design in the form of a website. Hence, it can be accessed anywhere and on any device. The GRF form was created like a database that was stored on the device's website. The website collected data, such as the reporting number, the time of reporting the presence of water, the ICAO reporting code, the conditions at the time the report was made, the height of the water coverage on the runway, a description of the runway surface conditions due to contamination, and the officers who made the report. It can also organize the results/data neatly and properly. This website can be used online and accessed from computers, laptops, and smartphones (Kováčiková *et al.*, 2022).

Based on current conditions, the author advises Juwata Tarakan International Airport to change the GRF reporting method, which originally used a manual system to be converted into a digital system. This innovation results from rapid technological advancement and is one solution that can be done to increase data effectiveness (Netto, Silva and Baltazar, 2020). The presentation of GRF data can be managed better and can facilitate ground personnel in reporting. The Airport management can provide training or socialization on how to use this GRF website so that this innovation can be used as much as possible to improve data management. In addition, the website can be developed to always keep up with the times. (TUNCAL, USLU and DURSUN, 2021)

It is important to note that the time information in the GRF might be slightly differences between the GRF data done manually or using the website. To address this issue, a mathematical formulation can be used as follows:

$$\Delta T = (T_1 + T_2) \times 60 \text{ minutes}$$

Information :

T_1 : Time to manually create a GRF report

T_2 : Time to create a GRF report using the GRF reporting website

$$\Delta T = (1.5 - 1,334) \times 60 \text{ minutes}$$

$$\Delta T = 0.167 \times 60 \text{ minutes} = 10 \text{ minutes}$$

Therefore, updating the data using the website can reduce time usage or make time use more efficient by 10 minutes.

3. Guide GRF assessment

Runway surface conditions should be reported when there are significant changes to the runway due to contamination. When reporting condition surfaces, the runway must reflect changes until it is no longer contaminated. The changes in conditions surface take-off spur used in the report are considered significant if there are changes on:

- runways condition code,
- the type of contamination,
- contaminant coverage, and/or
- contaminant depth.

The information that the assessing officer must include in this section is as follows:

- a. Aerodrome location indicator: 4 letters ICAO code for each airport, e.g. WAQQ (Juwata Tarakan Airport)

- b. Date and time assessment (time use time format UTC, Universal Time Coordinated)
Example: MMDDhhmm 07280930 (occurs on the date 28 months 7, o'clock 17.30 time local) (GMT+8)
- c. Runway Designation Number (written from lowest), e.g. 06- 24
- d. Runway Condition Code, which is assessed at each third of the runway. It is reported with code in the group that is separated with punctuation " / ", e.g. 5/5/2, with the first column representing the first third of the designated runway. The percentage of water coverage for each third of the runway is provided with the description "NR" if the scope water is less than 10% on the runway.
- e. An example of contaminant depth reporting is whenever there is a significant change
 - a) After evaluating the first runway condition, the first runway condition report is issued. The initial report is:
5 / 5 / 5 100 / 100 / 100 NR / NR / STANDING WET
For contaminants other than Standing Water, its depth is not reported. In the information string, the position of this type of information is identified as /NR/
 - b) Condition descriptions for each third of the runway are reported in letters capital use term *WET*, *STANDING WATER*, *DRY* for the third part on the runway, e.g. *STANDING WATER/STANDING WATER/STANDING WATER*
 - c) Write down the width of the runway, e.g. 45

4. Website Design

The Global Reporting Format website has several features. These features are listed as follows.

- a) Login Page

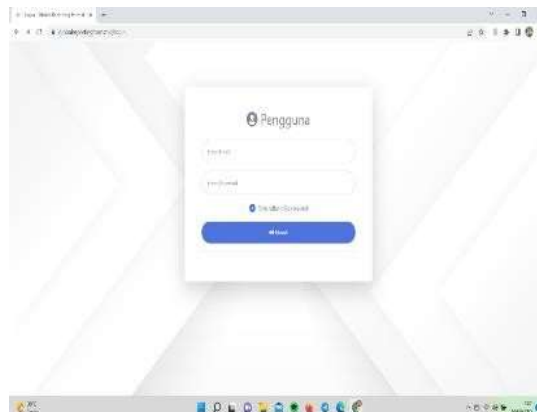


Figure 5. Page Login

Figure 5 shows the website's login page. It contains data from inspection officers who will report the condition of the runway whenever water coverage is found.

- b) Home page



Figure 6. Home Page

Figure 6 provides the home page containing menu options, such as recapitulation, user data, and worksheets.

c) Data User Page

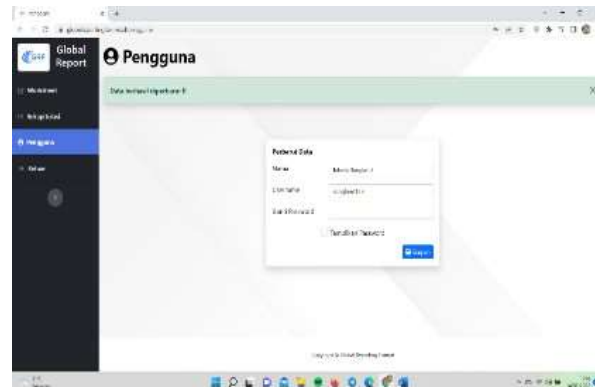


Figure 7. User Data Page

Figure 7 displays the user data page. This page contains user data which functions to change and store website *usernames* and *passwords*.

d) Data Filling Page

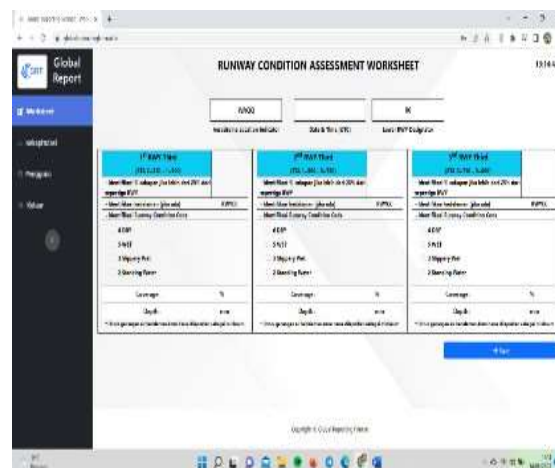


Figure 8. Data/Worksheet Filling Page

Figure 8 shows a page to fill in data. This page can be accessed after entering the username and password on the login page. Therefore, it cannot be freely accessed by random users.

e) Field Data Filling Page

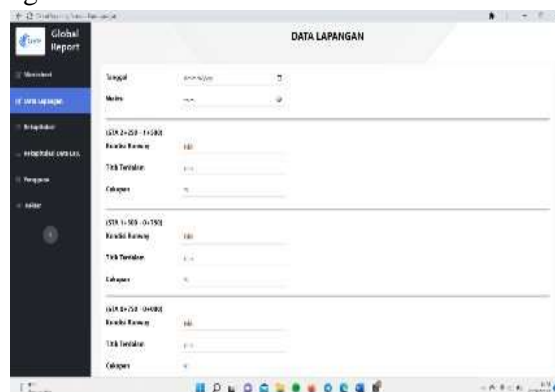


Figure 9. Field Data Page

This page functions as a place for filling in data that are still raw or have not been processed according to technical conditions.

f) Field Data Recapitulation Page



Figure 10. Recapitulation Field Data Page

The recapitulation of field data is presented in Figure 10. On this page, the results of the field data recapitulation are presented and filled in from days before. Therefore, the checking process is easier and organized neatly.

g) Data Page

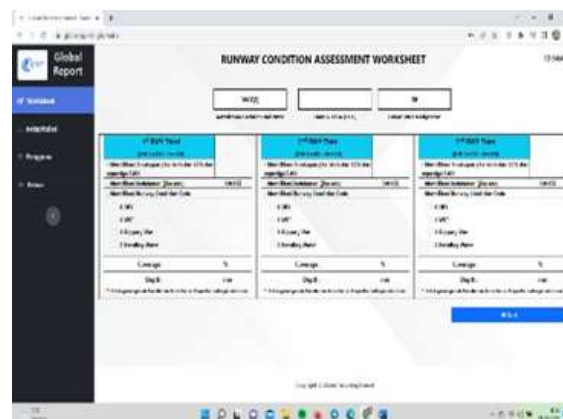


Figure 11. Page GRF data

The data that has been successfully entered and saved is presented on the data page, as shown in Figure 11. This data will then be received by the admin, the ATC officer.

h) Recap Data Page

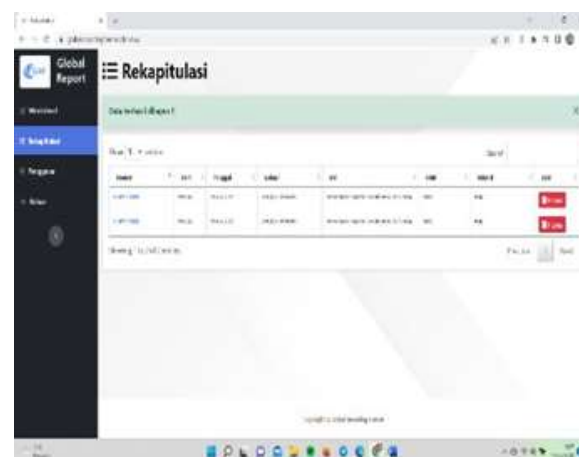


Figure 12. GRF Data Recap Page

Figure 12 illustrates the GRF data recap page. The page contains the results of data recaps that have been filled in from previous days are presented. Thus, the checking is easier, and the data can be neatly arranged.

i) Results



Figure 13. GRF Report Result Page

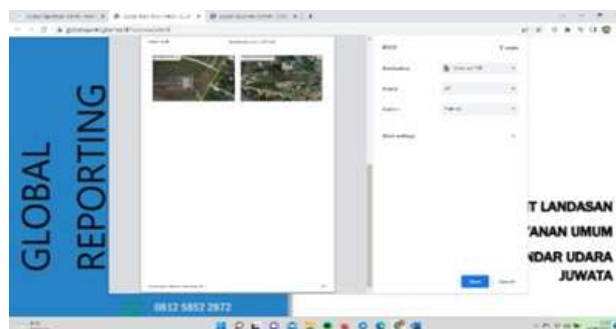


Figure 14. GRF Report Result Page



Figure 15. GRF Report Result Page

Figures 13-15 indicate the GRF report pages. The results are presented in a PDF file, allowing it to be sent to ATC without scanning it from paper or converting it from Word to PDF.

5. Report-Making Stage Using a Website

Several steps must be prepared and required to make the GRF through the website. First, data on puddle water were taken from the runway. After that, the GRF reporting website is accessed through Google Chrome or Mozilla by typing www.globalreportingformat.id. The next step is to log in to the website reporting GRF by filling in the username and password that has been

created. Then, the data field / the raw data on the field data page corresponding to the data should be filled in. The next step is to fill in the data in the reporting form/ worksheet under the procedure for reporting the presence of water on the runway. Finally, the data that has been filled in is saved and recapped.

6. Creating a shortcut on the desktop or home page of a laptop or smartphone

Users can create a shortcut on their device's main page to access the website quickly using the following steps. First, users need to open the global reporting format (GRF) reporting website by typing "globalreportingformat.id". After that, they can locate the top right and click more (⋮). Then, they can click more features (more tools). Finally, click create a shortcut, enter a name for the shortcut, and click on create.

Discussion

Reporting inundation requires an effective and efficient method so that the reports can be submitted quickly and accurately. One method is to digitize the global reporting format (GRF) into a website form. Evaluating the GRF website aims to find out whether the website can work well. Then, it examines whether existing water in the take-off runway has been successfully entered. In addition, the GRF website will be used by the airport unit service, so it should be tested to see if the website can work on smartphones, laptops, or PCs. Moreover, the digitalization of the GRF has several advantages and disadvantages. Therefore, this website needs to be developed and always evaluated to suit its function.

In order for the website to be implemented effectively, human resources who can operate it well are also needed. One way is to provide training or socialization regarding how to use the GRF website. Thus, this innovation can be used as optimally as possible to improve airport data management.

As argued earlier, this study changed the manual GRF reporting to a digital system. Developing methods by utilizing rapid technological progress is one solution that can be done to increase data effectiveness. Where the presentation of GRF data can be managed better and make it easier for basic personnel to carry out reporting.

Table 1. Test Results of the Website Data

Data Input	Expected results	Observation	Conclusion
Users can log in to access the global reporting format website	The login page can be accessed	User access The GRF website	Successful
Users can fill in their username and password	Username column and passwords can be filled	Users can fill in their username and password	Successful

Table 2. Test Results of the GRF Data

Input Data	Expected results	Observation	Conclusion
Users can enter the GRF reporting website	Users can enter the website	Users can access the website from the Google Chrome and Mozilla browsers	Successful
Users can enter data on water coverage on the website form	The data can be saved	Users can save that data	Successful

Users can save the GRF data which has been filled in	Users can save this data in the form of a PDF file	Users can save data in the PDF form	Successful
Users can see the data recap that has been previously recorded	Users can see the results of data recaps and save them in the PDF files	Users can see data recap and save them again in the PDF format	Successful

Table 3. Results of the Test Data from Different Devices

Device	Web Browser	Access Website	Reporting Results
Laptops / PC	Google Chrome	√	√
Smartphones	Google Chrome	√	√
Laptops / PC	Mozilla Firefox	√	√
Smartphones	Mozilla Firefox	√	√

Conclusion

Global Reporting Format, done manually using paper, has several shortcomings that can affect reporting effectiveness. On the other hand, the website-based paperless system has the advantages. For instance, it can increase the effectiveness of Global Reporting Format data reporting as it can save money and time for about ± 10 minutes.

Designing a Global Reporting Format website is conducted by surveying data and problems in the field and creating a page display design for the website height, scope water in the take-off runway, description of the runway surface condition due to contamination, and the officers who make the report.

The website can store and organize the results/reporting data of water level inspections on the runway neatly and properly. This website can be used online and on computers, laptops, and smartphones. Thus, it is more flexible to use. In addition, the GRF form would be saved into a database stored on the website. The data stored includes the reporting number, time of water presence reporting, ICAO code reporting, and information about the condition during the reporting.

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