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ANALYSIS OF DATA ACCESS USING LOOKER STUDIO-BASED E-REPORT FOR PROHIBITED ITEMS RECONCILIATION AT HBSCP IN KALIMARAU AIRPORT

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ABSTRACT
Aviation security is a crucial aspect of airport operations that requires proper recording and reporting systems according to established procedures. The Airport Management Unit (UPBU) Class I Kalimarau with Security System Category E faces challenges in the prohibited items reconciliation process that is still conducted manually at the Hold Baggage Security Check Point (HBSCP). This research aims to design a Looker Studio-based e-report for prohibited items reconciliation, understand the working mechanism of the e-report system, and determine its capability in addressing recording and reporting issues in reconciliation data. This study employs Research and Development (R&D) methodology with the ADDIE development model (Analysis, Design, Development, Implementation, Evaluation). The system was developed utilizing Google Sheets as the database and Looker Studio as the data visualization and analysis tool to facilitate coordination among AVSEC personnel, airline staff, and customer service. The evaluation results demonstrate that the system is highly suitable for implementation, with expert validation from subject matter experts and design/IT experts achieving an average percentage of 91.7%, while usability testing from users obtained a percentage of 95.27%, both categorized as "very worthy". This e-report system has proven capable of providing solutions for recording and reporting issues in prohibited items reconciliation, improving airport operations, aviation safety, and better archive management at Kalimarau Airport.

Keywords*:* e-report, prohibited items, Looker Studio, HBSCP, aviation security

1. INTRODUCTION

Despite numerous innovations in the transportation sector, airports and aircraft continue to play a vital role in connecting the world because of their time efficiency. With the ability to connect various cities and countries in relatively short periods, aircraft remain the primary choice for millions of passengers worldwide. Similarly, airports serve as the starting and ending points of air travel, functioning as connecting hubs between passengers and aircraft. It can be concluded that the transportation mode with the highest level of importance is air transportation, namely airplanes. This is because aircraft are far more effective, efficient, and faster compared to other modes of transportation. Aircraft are considered one of the safest modes of transportation in the world. This is due to the strict regulations, standards, and procedures that must be followed before an aircraft takes off, such as prohibitions on carrying items that could threaten flight safety, mandatory health tests for pilots and cabin crew, internal and external aircraft condition checks, and others. (Isra et al., 2022)

Therefore, every airport is obligated to provide excellent service, especially in aviation security and safety. At Kalimarau Airport Management Unit, the security system is categorized as Security System E (ASP KALIMARAU 2024, n.d.). Based on the Regulation of the Minister of Transportation of the Republic of Indonesia Number PM 9 of 2024 concerning National Aviation Security, airports with total domestic departing passengers of more than 500,000 (five hundred thousand) people/year up to a maximum of 1,000,000 (one million) people/year are airports with Security System E. Every party involved in the aviation process, including passengers, Aviation Security officers commonly referred to as AVSEC, airline companies, and other related parties, must ensure that air travel can be conducted safely, comfortably, and free from threats that could endanger flight safety. One important step to maintain security is by examining passenger baggage, both in the cabin and in checked luggage, to ensure that no prohibited items are transported.

To achieve this, a reconciliation process is required that involves various airport units: AVSEC officers,

airline companies, and customer service units. These three units play important roles in ensuring that prohibited items can be detected and prevented from the beginning of the journey through strict inspection procedures. This process takes place at the Hold Baggage Security Check Point (HBSCP), where passenger baggage inspection is conducted thoroughly. However, at Kalimarau Airport, this reconciliation process still operates manually, causing inefficiency. Airline officers must be called manually, and information regarding passengers that needs to be communicated to the information unit is also still delivered manually, including when passengers are already in the waiting room.

This research aims to identify the reconciliation process and inter-unit integration at Kalimarau Airport by developing a system that can facilitate coordination between AVSEC officers, airlines, and customer service units. This system is expected to reduce existing inefficiencies and improve safety, passenger comfort, and more efficient archive management. The main focus of this research is the development of an integrated e-report system for archiving prohibited items data. This research is expected to make a significant contribution to improving security systems, airport operations, and better archive management.

2. LITERATURE REVIEW

The reconciliation of prohibited items in aviation is a critical aspect of airport security management. According to the Indonesian Civil Aviation Safety Regulation (CASR) and PM 80 of 2017 on Aviation Security Programs, all items identified during Hold Baggage Security Check Point (HBSCP) inspections must be reconciled through a documented process. Manual recordkeeping often leads to delays, loss of data, and reduced traceability. Thus, the use of digital systems is increasingly important to improve efficiency and transparency.

E-reporting systems have emerged as effective tools for digital data logging and real-time monitoring. Kurniawan (2024) developed a daily security log application using AppSheet, which demonstrated improved accessibility and record accuracy. Similarly, Putri and Vaoutama (2024) employed Looker Studio for business intelligence dashboards, showing that data visualization improves decision-making across departments.

Looker Studio, formerly Google Looker Studio, is a cloud-based business intelligence tool that allows users to create interactive dashboards by connecting various data sources such as Google Sheets, BigQuery, and others. Purnama et al. (2025) emphasize that Looker Studio enhances data transparency and supports real-time filtering and sharing- making it suitable for operational environments like airports.

Google Sheets functions as a dynamic spreadsheet platform that supports collaborative data entry and real-time updates. It enables effective data collection, validation, and synchronization across departments, particularly when integrated with visualization tools.

The ADDIE model, used in this study, is a widely recognized framework for instructional system design, consisting of Analysis, Design, Development, Implementation, and Evaluation. It is applicable not only in educational contexts but also in the structured development of technological solutions, such as digital reporting tools.

Previous studies such as those by Modestania and Sutarwati (2023) have explored reconciliation in airport contexts; however, few have addressed the integration of Google-based platforms in reconciling prohibited items. This research contributes to filling that gap by presenting an interactive and role-based e-report model applicable to airport security workflows.

3. METHODOLOGY

This study used the Research and Development (R&D) methodology with the ADDIE development model, which consists of five sequential stages: Analysis, Design, Development, Implementation, and Evaluation. This model was choosen due to its structured approach the building digital systems while ensuring usability and feasibility at each stage.

- Analysis: Field observations were conducted at HBSCP in Kalimarau Airport during the On the Job Training activites to identify current manual workflows and inefficiencies in prohibited items reconciliation.
- Design: A structured Google Sheets system was developed to collect detailed dataa from AVSEC, airline, and Customer Service. Fields included passenger identify, item description, inspection outcomes, etc.
- Development: The system was built in Google Sheets and integrated into Looker Studio to create visual dashboards using scorecards, bar charts, pie charts, filter, etc.
- Implementation: The system was tested by real users in the field (AVSEC, airline, Customer Service). A usability feedback form was distributed via Google Forms.
- Evaluation: Three experts (two Material Expert & 1 Technology Information/Design Expert) validated the system. Their evaluations assessed relevance, functionality, design, and readability. Usability testing involved real users and measured overall ease of use and clarity.

4. RESULT AND DISCUSSION

4.1 System Design Output

The e-report system was succesfully built using Google Sheets and integrated into Looker Studio, allowing real-time data updates and visualization. Different sheets were provided for each role and user-friendly features such as drop-downs, date auto-fill, and color coding were implemented.

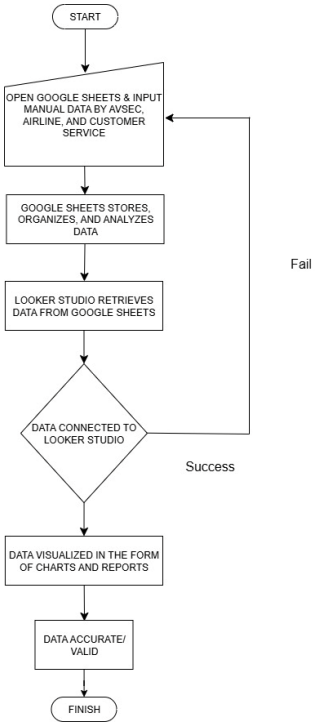

Figure 1 e-report system flow

4.2 Expert Validation

This indicates the system was relevant, clear, well-organized, and aligned with operational needs.

Table 1 Product Validation Test Results

NO.	ASSESSMENT ASPECTS	MAXIMUM SCORE	SCORE OBTAINED
1.	Product Design Appearance	20	20
2.	Product Functionality	20	20
3.	Product Ease of Use	20	20
TOTAL		**60**	**60**

Description:
Number of Aspects = 3
Number of Indicators = 12
Maximum Score = 60
Score Obtained = 60
Formula:
P (%) = (Σ Score from data collection) / (Criterion Sc ore) × 100%
P (%) = 60/60 × 100%
P (%) = **100%**

Table 2 Material Validation Test Results

NO.	ASSESSMENT ASPECTS	MAXIMUM SCORE	SCORE OBTAINED
1.	Material Relevance	36	40
2.	Language Clarity	34	40
3.	Pesentation Accuracy	35	40
TOTAL		**105**	**120**

Description:
Number of Aspects = 3
Number of Indicators = 12
Maximum Score = 120
Score Obtained = 105
Formula:
P (%) = (Σ Score from data collection) / (Criterion Score) × 100%

Material Expert with Mrs. Dr. Yuyun Suprapto, S.SiT., M.M.
P (%) = 56/60 × 100% → P (%) = **93.33%**

Material Expert with Mr. Triaji Wijaya, A.Md.Tra.
P (%) = 49/60 × 100% → P (%) = **81.67%**

Thus, the total overall percentage from the product validation and material validation results is:
P (%) = (100 + 93.33 + 81.67) / 3 × 100
P (%) = **91.7%**

When this result is associated with the score interpretation in Table 2 and Table 3, a feasibility score of 91.7% falls within the 81–100% interval, indicating that the validation result of the Looker Studio–based e-report for prohibited items reconciliation is classified as "Very Worthy."

4.3 Usability Testing

Table 3 Calculation Results Questionnaire Data Testing

NO	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	5	5	5	5	5	5	5	5	5	5
2	5	4	5	5	4	5	5	5	4	5
3	5	5	5	5	5	4	4	4	5	5
4	5	5	5	5	5	5	5	5	5	5
5	5	4	4	5	5	5	5	5	5	5
6	5	5	4	5	4	5	5	5	5	5
7	5	5	5	5	5	5	5	5	5	5
8	5	4	4	4	4	5	5	5	5	5
9	5	5	4	5	5	5	4	4	5	5
10	5	4	5	4	5	5	5	4	5	5
11	5	4	5	5	5	5	5	4	5	5
TOTAL	55	46	51	53	52	54	53	51	54	55
	524									

Description:
Expected score: 11 × 5 = 55 × 10 statements = 550

Formula:
Feasibility percentage = (Observed score) / (Expected score) × 100
Feasibility percentage = 524 / 550 × 100
Feasibility percentage = 95.27%

According to Arikunto: <21 = Very Unfeasible, 21–40 = Unfeasible, 41–60 = Fair, 61–80 = Feasible, 81–100 = Very Feasible.

Usability testing was carried out by calculating the percentage of responses from the respondents. The observed score was obtained from the total score of all responses from 11 respondents, amounting to 524. The

expected score was obtained from the maximum scale score multiplied by the number of statements and multiplied by the number of respondents, amounting to 550. After determining the observed and expected scores, the measurement result was 95.27%. A feasibility score of 95.27% falls within the 81–100% interval, indicating that the usability testing result for the Looker Studio–based e-report on prohibited items reconciliation is classified as **"Very Worthy".**

Usability testing with 11 users showed a 95,27% satisfaction rate, indicating that the system is:

- Easy to use
- Visually clear
- Useful in speeding up reconciliation processes

4.4 Discussion

Compared to previous manual records, the e-report offers significant improvements in speed, data accessibility, transparency, and coordination. This aligns with studies by Kurniawan (2024) and Putri & Vaoutama (2024), confirming the effectiveness of cloud-based reporting tools for security operations.

Figure 2 Final Display of the Data Input Sheet in Google Sheets

This form used by AVSEC officers, airline staff, and customer service to record the results of suspicious item inspections, as shown in this image. Each column in this sheet has supporting elements, including dropdown lists for the *Item Type*, *Item Indication*, and *Handling Status* columns, as well as a date picker for the *Time of Discovery* column, to ensure that no data is left blank. The form layout is designed to be consistent and easy to fill out, as well as to prevent input errors that could interfere with the data display process in the dashboard.

TANGGAL	NAMA PEMILIK BARANG	NOMOR BAGASI / JENIS BARANG	FLIGHT NUMBER	BOARDING TIME	JENIS BARANG	INDIKASI BARANG
3/14/2025	DIMAS PRATAMA	0614 65876	IW1361	07.00	LAGs	AMAN
3/19/2025	ARYA ANDIKA	0614 65877	IW1361	07.00	DANGEROUS ARTICLES	MENCURIGAKAN
5/22/2025	SURYA PATEH	0614 65878	IW1361	07.00	DANGEROUS GOODS	BERBAHAYA
5/22/2025	MARLINA	0614 65779	IW1361	07.00	EXPLOSIVE DEVICES	MENCURIGAKAN
5/22/2025	RIFQI FIRDIANSYAH	0663 58306	IW1361	07.00	WEAPONS	MENCURIGAKAN
5/23/2025	AGUS TEBE	0374 39419	IW1365	11.20	DANGEROUS GOODS	MENCURIGAKAN
5/24/2025	SITI NURHAEYATI	5531 43834	QG1403	12.05	DANGEROUS ARTICLES	MENCURIGAKAN
5/25/2025	PRIANKA	4144 41145	ID6347	14.00	WEAPONS	MENCURIGAKAN
5/25/2025	BINTANG	4155 51551	ID6347	14.00	LAGs	MENCURIGAKAN
5/25/2025	AHMAD NURROHMAN	5515 55613	QG1403	12.05	EXPLOSIVE DEVICES	MENCURIGAKAN
5/25/2025	AFTARA BRIAN	5621 51156	QG1403	12.05	DANGEROUS GOODS	MENCURIGAKAN
5/26/2025	PUJI	8510 85101	IU673	18.50	DANGEROUS ARTICLES	MENCURIGAKAN
5/26/2025	ANANDA BIANTORO	5515 54141	QG1403	12.05	WEAPONS	BERBAHAYA
5/27/2025	NURHALIMAH	5515 51515	QG1403	12.05	LAGs	MENCURIGAKAN
5/27/2025	SAL PRIYADI	5515 41416	QG1403	12.05	EXPLOSIVE DEVICES	MENCURIGAKAN
5/27/2025	LUNA MAYA	5515 58101	QG1403	12.05	DANGEROUS GOODS	BERBAHAYA
5/28/2025	KUNTO AJI	8510 48101	IU673	18.50	DANGEROUS ARTICLES	MENCURIGAKAN
5/29/2025	BASKARA	5518 59101	QG1403	12.05	WEAPONS	MENCURIGAKAN

Figure 3 Final Display of the Database Sheet in Google Sheets

This shows the DATABASE sheet, which functions as a storage for clean data resulting from the input in the INPUT DATA sheet. The data is automatically pulled from this sheet using the QUERY formula, which only displays rows that are complete and valid. Subsequently, this DATABASE sheet is used as the main data source in Looker Studio. Therefore, to ensure the dashboard displays accurate and up-to-date data, the column structure and data completeness must always be maintained.

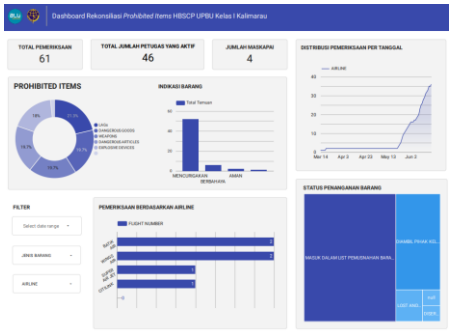

Figure 4
Final Display of the Dashboard in Google Looker Studio

This is the final display after all visual components have been built for the AVSEC unit, airline, and customer service involved in the HBSCP inspection process, the final dashboard layout is designed with consideration for readability, information flow, and ease of use. To enhance contrast and readability, dark blue and light gray colors are combined with a white background and black text. To maximize performance when accessed on connected devices, such as airport staff monitors, the font size and element positions have been adjusted. The system is intended to be instantly accessible via a Looker Studio link without the need to log in again. For daily reports, weekly evaluations, and monthly reports to management, the aim is to enable all units to share information seamlessly.

5. CLOSING

5.1 Conclusions

The analysis results indicate that the use of Google Sheets and Looker Studio in managing prohibited items reconciliation data at the Hold Baggage Screening Check Point (HBSCP) can enhance the accuracy and transparency of the reporting process. This cloud-based system enables stakeholders such as AVSEC, airlines, and customer service to access data in real time without location constraints, thereby accelerating coordination and decision-making processes.

Nevertheless, the analysis also identifies several challenges, including the storage capacity limitations of Google Sheets, the need for technical training for users, and potential data security risks that require strict access control arrangements. Overall, the implementation of this system makes a significant contribution to improving the

quality of prohibited items monitoring at the airport, although it still requires risk management strategies and the enhancement of user competencies to optimize its benefits.

5.2 Recommendations

Based on the analysis results, it is recommended that the management of prohibited items reconciliation data at HBSCP be continuously monitored to ensure that efficiency, accuracy, and transparency are maintained. Stakeholders are advised to conduct periodic trend analyses to identify occurrence patterns and potential security risks. In addition, consistent data input from all stakeholders should be monitored, along with the implementation of strict security policies to maintain the integrity and confidentiality of information. These measures will allow the analysis results to be fully utilized in supporting decision-making and enhancing oversight at the airport

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