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RESEARCH ARTICLE

Effects of Utilizing Google Drive as a Platform for Aircraft Maintenance Record Management

Author/s: Rayman King C. Gicale,* Alloisa Mae Baldueza, Jafeth Binas, Jemwil Dale Borres, Tom Andrew Hatague, Sunshine C. Iriarte, Eula Liza T. Manayon, Pedrich G. Redoblado, Rica Mae Tatchado, Zoren Torayno, Kimberly N. Cui-Toring, Eugene E. Toring, and Jhoselle Tus

Corresponding author email: *kingicale@gmail.com*
Affiliation: Indiana Aerospace University

Abstract

Google Drive is a cloud-based platform that enables efficient digital storage, sharing, and collaboration, making it a potential tool for modernizing aircraft maintenance documentation. This study examined the effects of utilizing Google Drive as a platform for aircraft maintenance record management at Ormoc Air, with the goal of enhancing operational efficiency and documentation practices in 2024. A quantitative research design was employed involving six licensed aircraft mechanics, four professional pilots, and ninety Aircraft Maintenance Technology (AMT) students from Indiana Aerospace University. Data were gathered using a structured Likert-scale questionnaire and analyzed through descriptive statistical methods, including frequency, weighted mean, and ranking. Results indicate that Google Drive positively supports record management, efficient data dissemination, and understanding of aircraft airworthiness, with airworthiness receiving the highest level of agreement among respondents. Despite these benefits, challenges related to limited audit features, security controls, and specialized aviation documentation tools were identified. The study concludes that Google Drive is an effective supplementary platform for aircraft maintenance record management and recommends its structured integration into aviation training institutions and maintenance operations to improve coordination, digital literacy, and documentation reliability.

Keywords: *google drive, aircraft maintenance record management, operational efficiency, digital documentation, aviation training*

Introduction

Aircraft maintenance plays a critical role in ensuring aviation safety, operational reliability, and regulatory compliance. Beyond mechanical upkeep, proper maintenance documentation is essential for tracking aircraft condition, supporting airworthiness certification, and ensuring accountability throughout an aircraft's service life. As global air traffic continues to increase, the demand for accurate, accessible, and well-organized aircraft maintenance records has become increasingly important.

Advancements in digital technology have transformed documentation practices across industries, including aviation. Traditional paper-based maintenance records are vulnerable to loss, damage, and inefficiency, particularly during audits and inspections. Consequently, aviation organizations and training institutions are increasingly exploring digital platforms to improve record accessibility, collaboration, and data integrity. Among these platforms, Google Drive has emerged as a widely used cloud-based application due to its flexibility, real-time collaboration features, and ease of access across devices.

Google Drive allows users to store, organize, and share documents securely through cloud storage, enabling collaborative work and version tracking. In the context of aviation, aircraft maintenance record management encompasses logbooks, inspection reports, compliance certificates, and maintenance histories that collectively establish an aircraft's airworthiness. Effective management of these records ensures timely maintenance, regulatory compliance, and enhanced operational safety.

Indiana Aerospace University has adopted Google Drive to support aircraft maintenance documentation for instructional and operational purposes. Through cloud-based access, AMT students, licensed mechanics, and professional pilots can manage and review maintenance records efficiently, reducing reliance on handwritten logs and minimizing documentation errors. This digital approach not only enhances compliance and transparency but also strengthens students' digital competence in preparation for industry practice.

This study aimed to assess the effects of utilizing Google Drive as a platform for aircraft maintenance record management at Ormoc Air. Specifically, it examined its effectiveness in terms of record management, efficient data dissemination, and aircraft airworthiness,

as well as identified the problems encountered by AMT students and aviation professionals when using the platform.

Research Objectives

The main purpose of this study was to assess the effects of utilizing Google Drive as a Platform for Aircraft Maintenance Record Management at Ormoc Air, aiming to enhance operations in 2024. Specifically, this study sought to answer the following sub-problems:

1. Evaluate the use of Google Drive as a digital tool to enhance hangar efficiency regarding aircraft maintenance documentation in terms of;
   1.1. record management;
   1.2. efficient data dissemination; and
   1.3. aircraft airworthiness?
2. Rank the problems encountered by the Aircraft Maintenance Students and Airmen

Methodology

Research Design

The study employed a quantitative research design to examine perceptions regarding the effectiveness of Google Drive as a platform for aircraft maintenance record management. Quantitative methods were appropriate as they allowed for systematic measurement of respondents' perceptions using numerical data and statistical analysis. The design enabled the assessment of trends related to workflow efficiency, record reliability, data dissemination, and airworthiness documentation.

Respondents

The study involved two groups of respondents selected to provide comprehensive insights into aircraft maintenance documentation practices. The first group consisted of six licensed aircraft mechanics from Ormoc Air and four professional pilots, chosen through purposive sampling due to their direct involvement in aircraft maintenance and reliance on maintenance records. The second group consisted of ninety AMT students from Indiana Aerospace University, selected through random sampling to ensure varied academic perspectives. In total, 100 respondents participated in the study.

Research Instrument

Data were collected using a self-constructed survey questionnaire designed to assess respondents' perceptions of Google Drive as a platform for aircraft maintenance record management. The instrument consisted of closed-ended statements measured using a five-point Likert scale, ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). The questionnaire addressed three key areas: record management, efficient data dissemination, and aircraft airworthiness. The instrument was distributed online via Messenger and in person, depending on respondents' availability.

Data Collection Procedure

The researchers conducted data collection over a two- to three-week period. Prior to distribution, respondents were informed of the study's objectives and assured of confidentiality. Surveys were administered to licensed aircraft mechanics, professional pilots, and AMT students using both online and face-to-face methods. Purposive sampling was applied to aviation professionals, while random sampling was used for student participants. Completed questionnaires were collected, encoded, and prepared for statistical analysis.

Data Analysis

Data were analyzed using descriptive statistical tools. Frequency and percentage distributions were used to determine response patterns, while weighted mean scores were computed to assess the overall level of agreement for each indicator. Ranking was applied to identify the most significant problems encountered by respondents in utilizing Google Drive for aircraft maintenance record management. These methods enabled a clear interpretation of respondents' perceptions relative to the study objectives.

Ethical Considerations

All respondents received a detailed description of the study's aim, procedure, and potential risks. All survey data were preserved by the researchers and kept in a secure database. The survey was designed to be non-intrusive and created no excessive stress or pain for participants. The study's results aimed to better understand the effects of utilizing Google Drive as a platform for managing aircraft maintenance records, ultimately leading to improved preparation for work in the aviation industry. These ethical standards were crucial for maintaining trust and integrity in academic research. By following these rules, the research was conducted professionally and respectfully, ensuring fairness and protecting participants throughout the study.

Results and Discussion

Record Management

Record Management is the efficient, systematic control of records from creation to disposal, in any format. In this study, systematic control of aircraft-related documentation, including maintenance records, logbooks, flight records, and compliance certificates, is used by aircraft maintenance students at Indiana Aerospace University.

It ensures accuracy, compliance, and safety. Information Management Theory highlights the role of organized information in supporting efficient decision-making (Detlor, 2010). Students' engagement with these systems reflects their reliance on structured information practices for aviation standards.

Table 1 presents the participants' responses regarding the use of Google Drive for record management.

Table 1. *Record Management*

Indicators	*Weighted Mean*	*Description*
1. Google Drive can help AMT students properly store and organize aircraft maintenance records during hands-on tasks or lab activities.	4.29	Strongly Agree
2. Google Drive's folders and search tools make it easier for AMT students to retrieve previous maintenance entries and documentation.	4.22	Strongly Agree
3. Version history in Google Drive allows AMT students to track updates and corrections made in their maintenance records.	4.18	Agree
4. Collaborating with classmates or instructors through Google Drive improves the accuracy and completeness of our maintenance logs.	4.18	Agree
5. Storage space in Google Drive is sufficient to keep multiple maintenance reports, manuals, and reference documents needed for AMT coursework and future fieldwork.	4.11	Agree
Average Weighted Mean	4.19	Agree

Legend: 4.21-5.00: Strongly Agree, 3.41- 4.20: Agree, 2.61.3.40: Neutral, 1.81-2.60: Disagree, 1.81 - 2.60: Strongly Disagree

Efficient Data Dissemination

Efficient data dissemination involves distributing information to maximize access and utility while minimizing costs. This study examines the effectiveness of Google Drive in disseminating data to aircraft maintenance students at Indiana Aerospace University, supporting the Technology Acceptance Model (TAM), which suggests that the perceived usefulness and ease of use of a technology significantly influence how often users engage with it (Alwi, 2021).

Table 2 presents the participants' responses in terms of how efficient Google Drive is in data dissemination.

Table 2. *Efficient Data Dissemination*

Indicators	*Weighted Mean*	*Description*
1.Google Drive enables AMT students to quickly and securely share maintenance files and reports with instructors or team members.	4.21	Strongly Agree
2. Real-time collaboration feature in Google Drive helps AMT students work together effectively on group maintenance projects or tasks.	4.21	Strongly Agree
3. Cloud access in Google Drive helps AMT students submit or receive aircraft maintenance records, especially during offcampus or field	4.12	Agree
4. Google Drive allows faster and more organized sharing of reports between students and instructors for evaluation and feedback.	4.14	Agree
5. Setting custom access permissions in Google Drive helps AMT students protect their work while still allowing collaboration when needed.	4.24	Strongly Agree
Average Weighted Mean	4.18	Agree

Legend: 4.21-5.00: Strongly Agree, 3.41- 4.20: Agree, 2.61.3.40: Neutral, 1.81-2.60: Disagree, 1.81 - 2.60: Strongly Disagree

Aircraft Airworthiness

Airworthiness of an aircraft refers to its suitability for safe flight, meaning it conforms to its approved design and is in a condition for safe operation. This study examines how aircraft maintenance students at Indiana Aerospace University interact with technical tools, such as Google Drive, to access and manage critical aircraft records, including maintenance logs and compliance certificates. The sociotechnical theory highlights the synergy between human and technical systems in ensuring airworthiness.

Sociotechnical theory emphasizes that airworthiness is contingent upon the interplay of social factors (e.g., students' skills and communication) and technical systems (e.g., user-friendly data-sharing platforms), thereby enhancing safety and educational efficiency (Ntara, 2023).

Table 3 presents the participants' perceptions of aircraft airworthiness associated with using Google Drive.

Table 3. *Aircraft Airworthiness*

Indicators	*Weighted Mean*	*Description*
1. Storing maintenance records on Google Drive helps AMT students understand how proper documentation supports airworthiness compliance.	4.15	Agree
2. Google Drive gives AMT students easy access to records that demonstrate the airworthiness of aircraft during training inspections or simulations.	4.19	Agree
3. I believe Google Drive's backup features protect the integrity of airworthiness records AMT students create in training.	4.32	Strongly Agree

4 Google Drive's backup features protect the integrity of the airworthiness records AMT students create in training.	4.12	Agree
5. Tracking changes in documents through Google Drive helps AMT students learn about transparency and traceability in airworthiness documentation.	4.35	Strongly Agree
Average Weighted Mean	4.22	Strongly Agree

Legend: 4.21-5.00: Strongly Agree, 3.41- 4.20: Agree, 2.61.3.40: Neutral, 1.81-2.60: Disagree, 1.81 - 2.60: Strongly Disagree

Problems Encountered

The problems encountered in the effects of utilizing Google Drive as a platform for aircraft maintenance record management include technical issues such as change tracking and system downtime, a lack of specialized safeguards needed for secure aircraft maintenance record dissemination, limited knowledge of features, organizing concerns, difficulties in tracking detailed audit features, and challenges with fast, streamlined sharing of aircraft records. These issues may affect users' trust and satisfaction, especially among students and airmen who rely on the app for managing their aircraft maintenance and academic records.

Table 4 lists the problems encountered in utilizing Google Drive as a platform for aircraft maintenance record management.

Table 4. *Problems Encountered*

Indicators	*Frequency*	*Rank*
Google Drive's change tracking lacks the detailed audit features needed to effectively document airworthiness records.	34	1
Google Drive's collaborative features lack the specialized tools and controls needed to effectively support students in managing detailed aircraft maintenance records	31	2
Google Drive's customizable permissions control access, but lacks advanced security and tracking for reliable data sharing	30	3
Google Drive's storage features offer basic reliability but lack specialized safeguards needed for secure aircraft maintenance record dissemination.	29	4
Google Drive's folder structure and search system lack specialized organization and filtering tools, making it difficult to quickly locate specific aircraft maintenance records.	27	5
Google Drive does not effectively organize aircraft maintenance records due to its lack of tracking tools, compliance features, structured data input, and automation	26	6
Google Drive's collaboration tools are not designed for fast, streamlined sharing of aircraft maintenance records essential for timely updates maintenance records essential for timely updates	21	8
Google Drive's permission settings are insufficient for controlling and securing the dissemination of sensitive aircraft maintenance data.	21	8
Google Drive for Aircraft Maintenance Record Management provides sufficiently accessible records for airmen in certifying airworthiness documents.	21	8
Google Drive's integration with Google Workspace tools does not enhance the efficient sharing or formatting of complex aircraft maintenance reports.	19	10

The ranking of the problems encountered in the effects of utilizing Google Drive as a platform for aircraft maintenance management in the Philippines faces several challenges, with the most significant being the lack of detailed change tracking, which occurs at a frequency of 34%.

The second-highest problem occurs at a frequency of 31. It is the collaborative features that lack the specialized tools and controls needed to effectively support students in managing detailed aircraft maintenance records.

The third highest problem is with a frequency of 30. The lack of advanced security and tracking for reliable data sharing is the fourth-highest problem, occurring at a frequency of 29. It is the lack of specialized safeguards needed for secure aircraft maintenance record dissemination.

The fifth most frequent problem occurs at a frequency of 29. The folder structure and search system lack specialized organization and filtering tools, making it difficult to quickly locate specific aircraft maintenance records.

Conclusion

The findings of the study demonstrate that both Aircraft Maintenance Technology students and aviation professionals perceive Google Drive as an effective platform for managing aircraft maintenance records. Respondents agreed that the platform supports organized record management, facilitates efficient data dissemination, and enhances understanding of aircraft airworthiness, with airworthiness receiving the strongest level of agreement. These results indicate that cloud-based documentation platforms such as Google Drive can positively contribute to both aviation training and operational environments.

Despite its advantages, the study identified several challenges, including limited audit tracking, insufficient specialized security features, and the absence of aviation-specific documentation tools. These limitations highlight the need for structured implementation and supplementary controls when using general-purpose cloud platforms for critical aviation records.

Overall, the study concludes that Google Drive serves as a viable supplementary tool for aircraft maintenance record management.

Aviation institutions and maintenance organizations are encouraged to integrate the platform into their workflows while establishing standardized procedures, access controls, and training programs. Such integration can enhance efficiency, promote digital literacy, and strengthen documentation practices aligned with airworthiness and regulatory requirements.

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