

Implementation of Electronic Document Management on Web Application for Teacher Supervision in Educational Institutions

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Received: September 22, 2025; Revised: November 03, 2025; Accepted: December 11, 2025

Please cite as: Sooksood, S. & Hinon, K. (2026). Implementation of Electronic Document Management on Web Application for Teacher Supervision in Educational Institutions. *International Journal of Educational Communications and Technology*, 6(1), 31-38.

ABSTRACT: *This research aimed to apply a web application for electronic document management for teacher supervision in educational institutions and to test the usability of the web application for electronic document management for teacher supervision in educational institutions. This research used an online questionnaire as a data collection tool to test the usability of 12 teacher supervision in educational institutions. The usability test results were analyzed using percentages, means, and standard deviations, along with descriptive statistics.*

The research findings revealed that applying a web application for electronic document management for teacher supervision in educational institutions using google workspace is appropriate for electronic document management by teacher supervision in educational institutions. It systematically organizes data structures according to the electronic document management flowchart for teacher supervision in educational institutions and can reduce document collaboration steps, enabling faster operations and reducing errors. The results of the usability test found that the level of opinion on the correctness and efficiency of collaboration of the document management on web application indicated an average score of 4.32, the convenience of using the document management on web application indicated an average score of 4.48, the results obtained from document management in the document management on web application indicated an average score of 4.50, the usefulness of using the document management on web application indicated an average score of 4.69, and the testers were most satisfied with using the document management on web application with an average of 4.64.

Keywords: Web application, Electronic document management, Teacher supervision

1. Introduction

Electronic documents are files in various formats, including document files, image files, and file extensions, that can be opened and used on electronic devices. Nowadays, electronic documents are widely used in various forms due to their ease of use. It can be easily edited and forwarded to the relevant parties immediately through electronic devices. Therefore, electronic documents are popular in the form of document files in education, communication, public relations, and other areas. Moreover, it potentially reduces the susceptibility of manual processes to human error (Klages & Zaeh, 2023). As a result, computers have been used to help process data, also known as electronic data processing (EDP). By integrating computer and network technologies, this workflow could accelerate information creation, thereby enhancing the accuracy of the outcome (Adebusayo et al., 2022). To enhance the efficiency of document operations. The process of creating electronic documents involves converting data files using computer programs. Therefore, in preparing electronic documents, the teacher supervision instructor requires the ability to

prepare and effectively manage documents and must be proficient in computer and information technology, with the ability to create documents across various office software platforms.

A web application is a form of software that combines the functionality of a desktop application with the accessibility of a website. It is hosted on a server and accessed by users over a network, typically via a web browser. Web applications provide users with enhanced usability and can be conveniently accessed from a variety of electronic devices (Iqbal et al., 2024). Due to their inherent capabilities, web applications not only enhance user convenience but also facilitate a reduction in the use of office resources. According to a study on operational efficiency, a web-based document management application was implemented to facilitate faster and more effective collaboration among users. A web application not only streamlined teamwork but also mitigated paper waste by reducing the loss and unnecessary disposal of physical documents. Especially in the field of teaching practice in educational institutions of supervisors, which require a large number of documents to perform their work, such as documents requesting to observe teaching, documents to submit to apply for teaching practice, and documents requesting to attend teacher supervision, documents for personal approval, travel expenses of the teacher supervision Instructor, report evaluation of teaching students in educational institutions, documents on disbursement and disbursement of teaching practices in educational institutions, travel reports and many other attachments that the instructor needs to report the results of the work after the teacher supervision operation is carried out. To facilitate the accurate and timely reporting of teacher supervision results via a web application.

2. Research Objectives

- 2.1 To apply web application for electronic document management for teacher supervision in educational institutions.
- 2.2 To test the use of web applications in electronic document management for teacher supervision in educational institutions.

3. Literature Review

Web applications are crucial for document management in today's organizations, significantly enhancing convenience and efficiency. This is primarily due to their cross-platform accessibility, which allows users to open, view, and edit through internet-connected devices seamlessly. This eliminates the need to carry a flash drive or paper documents and also mitigates the consumption of consumable resources such as paper and ink, which not only reduces cost but also contributes to environmental sustainability (Han et al., 2021). In addition, the web application supports real-time collaboration. Multiple people can edit and comment on the same document simultaneously without encountering version differences. Furthermore, a web application also includes robust document management capabilities, which simplify the organization and retrieval of large volumes of files and features permission management capabilities, which are crucial for data security by allowing administrators to assign varying levels of access, such as read-only or editing privileges, to specific users (Alade, 2023).

Early document management often relied solely on storing files on personal computers or within corporate networks. Most files are stored as basic documents such as word, excel, or pdf, without a complicated management system. File sharing via email or portable media, such as discs and flash drives, leads to the potential for data loss, unauthorized access, and version control errors. Access permissions are often limited to the file holder. It becomes challenging to control and track file usage. Nowadays, document management has evolved significantly with the advent of cloud computing and web application technology. Multiple people can edit or comment on the same file instantly. The system features fine-grained access control tools, including the ability to restrict permissions for viewing, editing, or sharing files, as well as an audit log system that tracks document-related activities, including user actions and timestamps. It also offers automatic file backup and restore. It also integrates with other tools, such as e-Signatures, intelligent search, and connection to ERP systems or corporate workflows (Iovescu & Tudose, 2024).

One of the most popular web applications for managing electronic documents is google workspace, which many organizations use to manage internal documents due to its convenience and ease of use. This is partly because internal personnel or internal users share the same access domain or account for the same purpose, which is considered a web application that is convenient and easy to use for large organizations. Additionally, it is suitable for securing and restricting access rights from outside the domain. It is software that is provided and processed on a server over the Internet and easily accessed by users through a web browser. When a user enables google docs or google sheets for data processing, recording, and sharing takes place on google's cloud, which is an entirely web-based application

format (Sopwandin & Junaidi ,2024). Therefore, the adoption of tools in google workspace is one of the most comprehensive applications of web application technology for electronic document management today, enabling the collection, creation, editing, sharing, and storage of documents on a single platform. It also helps organizations reduce paper consumption. Increase collaboration efficiency and data security better than traditional document systems in a sustainable.

Teacher supervision in Thailand has now changed its role from focusing on control and monitoring to promoting, supporting, and developing teachers in a more participatory manner. Supervisors, including educators, school administrators, and mentors, serve as coaches who offer guidance and facilitate a reciprocal learning process with teachers. In teaching practice, co-development supervision has emerged as a widely adopted model, in which teachers and supervisors work together from teaching planning. The use of professional learning communities (PLCs) facilitates collaborative problem-solving among teachers, leading to the development of new teaching and learning methodologies. Additionally, technology has played a crucial role in improving teaching through applications such as online remote instruction and the use of data analytics to enhance teaching practices (Pan-Ngam, 2021).

4. Research Methods

4.1 The population to collect data is teaching lecturers who have experience in teacher supervision in educational institutions of the Department of teacher training in electrical engineering 23 people and 12 supervisors were selected by a specific selection method.

4.2 This research is a research and development using tools that have been developed, including a web application to manage electronic documents for teacher supervision in educational institutions, and the tool used to collect data is an online questionnaire created by the researcher and presented to the experts. Three supervision experts were selected to check the consistency of the questions and determine the appropriateness of the questionnaire with the sample. The results of the expert investigation showed that the questionnaire used corresponded to the purpose of the research and was suitable for the questionnaire.

- 1) Aspect 1: Accuracy and efficiency of electronic document management on web application interoperability.
- 2) Aspect 2: Ease of use of electronic document management on web applications.
- 3) Aspect 3: Results obtained from document management in the electronic document management on web application.
- 4) Aspect 4: Benefits of using electronic document management on web applications.
- 5) Aspect 5: Satisfaction with accessing electronic document management on web applications.

At the end of the usage inquiry. Testers contribute comprehensive feedback and recommendations for the web application's improvement. Based on each aspect of the inquiry, the Likert scale determines user satisfaction across five levels from 1 (lowest) to 5 (highest). In interpretation to rank the average score in different score ranges, the inter-stratum of the mean can be calculated to be 0.49 (Kitpridaburisut, 1988). As follows.

Average score 1.00 – 1.50 lowest interpretation
Average score 1.51 – 2.50 low interpretation
Average score 2.51 – 3.50 medium interpretation
Average score 3.51 – 4.50 high interpretation
Average score 4.51 – 5.00 highest interpretation

Data collection and analysis. In the first semester of the 2025 academic year, data were collected after the instructor utilized electronic document management on web application for teacher supervision in educational institutions. The process of collecting information is as follows.

1. The facilitator accesses the electronic document management on web application through a shared drive. The sample will receive an invitation to join the shared drive by adding access from the web application administrator. The trial period is available throughout the semester.
2. At the end of the semester, after the trial of the electronic document management on the web application. The researcher distributed a questionnaire to the sample group to gather their feedback on how to use the web application

to improve and develop the web to be more suitable and convenient for users in the future.

3. Once the sample has successfully completed the online questionnaire. The researcher processed and analyzed the questionnaire data using statistical software. The researcher used basic statistics to analyze the data, including percentage, mean, standard deviation, and depiction.

5. Results and Discussion

5.1 From the application of a web application for electronic document management for teacher supervision in educational institutions. This was achieved by designing, planning, and implementing the document management on a web application. The document management analysis chart summarizes the entire document management process from the beginning to the end of the supervision process in the educational institution. To design and plan the use of the web application for electronic document management to be suitable for the use of instructors and teaching practitioners. The analysis chart shows as follows.

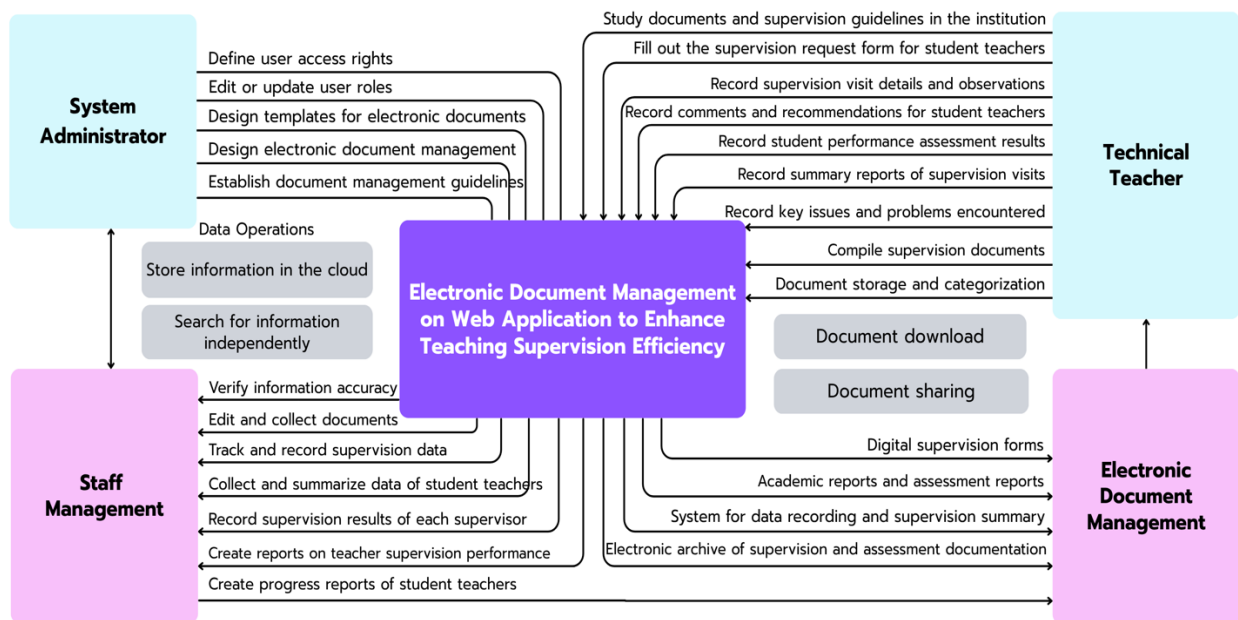


Figure 1. Document management analysis chart from supervision operations.

After a study was conducted to assess the suitability of web applications for electronic document management for supervision operations, and analyzing the document management chart in the supervision operation, and compiled in accordance with the operational procedures governing the different functions of a supervision practitioner, and the format of the document has been determined to be suitable for use in reporting the performance of the work. It is divided into folders for individual document management, which can be displayed as follows.

5.2 A study was conducted to assess the operational effectiveness of a web application for electronic document management, focusing on five aspects: (1) the accuracy and interoperability of the electronic document management on web application, (2) the ease of use of the electronic document management on web application, (3) the results obtained from document management in the electronic document management on web application, (4) the benefits of using the electronic document management on web application, and (5) the satisfaction of accessing the electronic document management on web application.

Based on inquiries regarding the accuracy and interoperability of electronic document management on web applications, The average score was 4.32, divided into the results of each question, including (1) the suitability of doc, excel, pdf, etc. files for editing documents, (2) the completeness of information as a guide for preparing supervision documents, (3) Able to add, print, delete, and edit information in the document without distortion, (4) Able to receive, send, and store documents on the shared drive correctly. From web application testing, it was found that the limitations

of using google workspace for document editing became apparent. If the computer's operating system is different, it results in the document's formatting differing from the original format.

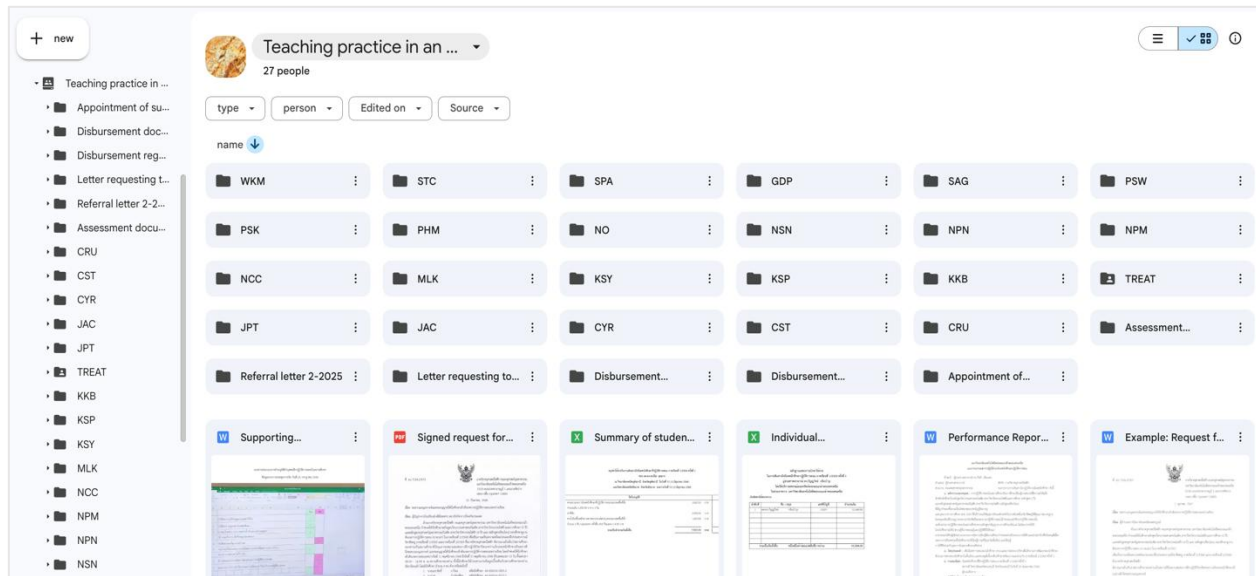


Figure 2. Example of a homepage for electronic document management for supervision teaching.

Table 1. Results of questionnaire on accuracy and interoperability of electronic document management web applications.

| | Evaluation Items | <i>M</i> | Min. | Max. | <i>S.D.</i> |
|-----|---|----------|------|------|-------------|
| 1 | Web app collaboration accuracy and performance | | | | |
| 1.1 | Suitability of doc, excel, pdf, etc. files for document editing | 4.18 | 3 | 5 | 0.75 |
| 1.2 | Completeness of information as a guide for the preparation of supervision documents | 4.45 | 4 | 5 | 0.52 |
| 1.3 | Can add information print, delete, and edit information in a document without distortion. | 4.27 | 3 | 5 | 0.65 |
| 1.4 | Receive and store documents on the shared drive correctly | 4.36 | 3 | 5 | 0.67 |
| | Total | 4.32 | | | |

Table 2. Results of the inquiry on ease of use of electronic document management web application.

| | Evaluation Items | <i>M</i> | Min. | Max. | <i>S.D.</i> |
|-----|--|----------|------|------|-------------|
| 2 | Ease of use | | | | |
| 2.1 | Convenient access on a shared drive | 4.82 | 4 | 5 | 0.40 |
| 2.2 | Easy to find information from naming files and folders | 4.36 | 3 | 5 | 0.81 |
| 2.3 | Quick access It's not complicated. | 4.45 | 3 | 5 | 0.69 |
| 2.4 | Works on any device text and images are not distorted | 4.27 | 3 | 5 | 0.65 |
| | Total | 4.48 | | | |

Based on inquiries regarding the ease of use of the electronic document management on web application. The average score was 4.48, divided into the results of each question, including (1) Convenient access to shared drives, (2) Easy to find information from file and folder, (3) Fast access, (4) Works on any device. Text and images are not distorted. The average score indicates the ease of use and document management through the web application. It is found that users can utilize it with ease and quickly on any device, However, all of this convenience depends on the user's internet connection.

Table 3. Results of the query on the results of document management in the electronic document management web application.

| | Evaluation Items | <i>M</i> | Min. | Max. | <i>S.D.</i> |
|-----|---|----------|------|------|-------------|
| 3 | Aspects of document management in the web app | | | | |
| 3.1 | The information displayed in the operational coverage folder | 4.45 | 4 | 5 | 0.52 |
| 3.2 | Examples available can be used as a guide and followed. | 4.55 | 4 | 5 | 0.52 |
| 3.3 | Shared drives are effective in linking data. | 4.45 | 4 | 5 | 0.52 |
| 3.4 | Editing documents together, it helps to make disbursements faster | 4.55 | 4 | 5 | 0.52 |
| | Total | 4.50 | | | |

Based on inquiries regarding the results obtained from document management on web application for managing electronic documents. The average score was 4.50, divided into the results of each question, including (1) The information displayed in the folder covered the operation, (2) The available examples can be used as a guide and followed, (3) Shared drives effectively link data, and (4) Editing documents together helps to make withdrawals faster. From the test of managing documents through the web application. The results of the accessibility test indicate that the files collected in each user's folder had accurate information and could support both supervision reporting and disbursement reporting more efficiently.

Table 4. Results of inquiry on the benefits of using web applications to manage electronic documents.

| | Evaluation Items | <i>M</i> | Min. | Max. | <i>S.D.</i> |
|-----|--|----------|------|------|-------------|
| 4 | Benefits of use | | | | |
| 4.1 | Reduce the process of searching for documents | 4.64 | 4 | 5 | 0.50 |
| 4.2 | Simplifies the preparation of documents | 4.64 | 4 | 5 | 0.50 |
| 4.3 | Reduce paper waste | 4.73 | 4 | 5 | 0.47 |
| 4.4 | channel to perform paperwork together to reduce time | 4.73 | 4 | 5 | 0.47 |
| | Total | 4.69 | | | |

According to the results of the benefits of using electronic document management on web applications, the average score was 4.69, divided into the results of each question, including (1) Reduce the process of searching for documents, (2) It simplifies the preparation of documents, (3) Reduce paper waste, (4) It is a channel for joint document work to reduce time. The average score indicates the benefits of choosing electronic document management through this web application. It can also help sustainably reduce the use of natural resources.

Table 5. Results of satisfaction survey on access to electronic document management web application

| | Evaluation Items | <i>M</i> | Min. | Max. | <i>S.D.</i> |
|-----|---|----------|------|------|-------------|
| 5 | Aspects of accessibility | | | | |
| 5.1 | This will make it more guidelines for supervision operations. | 4.55 | 4 | 5 | 0.52 |
| 5.2 | Shorten the time to prepare disbursement documents. | 4.64 | 4 | 5 | 0.50 |
| 5.3 | Provide a source of assessment documents for supervision. | 4.73 | 4 | 5 | 0.47 |
| 5.4 | Overall satisfaction with the use of this shared drive | 4.64 | 4 | 5 | 0.50 |
| | Total | 4.64 | | | |

According to the results of the survey on satisfaction with accessing electronic document management on web applications, the average score was 4.64, divided into the results of each question, including, (1) Provide clear guidelines for supervision operations, (2) Shorten the time to prepare disbursement documents, (3) This provides a source of assessment documents for supervision, (4) Overall satisfaction with using this shared drive. Based on the satisfaction of the trial of electronic document management on the web application, it was found that the group of testers was satisfied at the highest level. This is anticipated to assist teacher supervision have a more straightforward approach to supervision performance. It can be used as an essential source of information for the performance of all supervisors and can be used as an effective source of information collection for each supervisor.

6. Conclusion

Results of the application of a web application for managing electronic documents for teacher supervision in educational institutions. The researcher began by studying and analyzing a web application designed to manage the documents of teacher supervision in educational institutions. Based on the analysis, the researcher selected a suitable

cloud-based document management system. The platform is designed to ensure a convenient, rapid, and consistent workflow, and is suitable for the effective management of documents required by the teacher supervision instructor throughout the operations. Google workspace applications are selected due to the convenience of a single, multi-purpose system. The system is available with no additional cost to all personnel who perform supervision operations in educational institutions. Consequently, the system was chosen to enhance collaborative efficiency among teacher supervision instructors. The use of shared drives in google workspace is essential and beneficial for managing documents that require systematic collaboration (Google Workspace, 2025). It has several unique features and advantages compared to other tools, such as the fact that the file owner belongs to the team, not the individual, and the files and folders in the shared drive belong to the organization or team, not to the account that created the file. Upon a member's resignation or change of location, the files are retained and remain accessible, unlike documents stored in a personal drive, which are often lost. It reduces the issue of file discoverability, ensuring all team members have a consistent organizational structure, making it ideal for tasks that require data sharing. This is in line with the research by Rithidech, et al. (2021), who found that web applications offer distinct advantages, including centralized user data management and access controls, as well as the capacity for real-time collaboration, by reducing the need for frequent file transfers, which is ideal for documents, reports, roadmaps, and other files that require frequent updates.

The results from testing and evaluation of web applications to manage electronic documents for teacher supervision in educational institutions. The evaluation of user accessibility was conducted on a sample of users from all genders, which revealed that users across all age groups were able to access the electronic document management system and demonstrated a high degree of proficiency in using google workspace documents. This is necessary for working in the digital age, which requires the ability to apply skills, knowledge, and attitudes to achieve work goals. Considering each aspect, the suitability of shared files in electronic document management on web applications was evaluated with an average score of high, indicating that the suitability for use together is very appropriate but not the most suitable, which is consistent with the research by Chankhao, (2021). Found several functional limitations in electronic document management systems, which do not align with the operational requirements of their users. It is possible to refine the document format to enhance its clarity and user convenience in the future. The usability of the electronic document management on web application for supervisors was evaluated with an average score of high, which aligns with the findings by Han et al., (2020), which noted that electronic document management systems enable all personnel to maintain timely awareness of relevant documents and can be stored in designated categories to facilitate more efficient searching.

The benefits of using electronic document management on web applications for supervisors received the highest average score. It indicates that the electronic document management on web application provides significant benefits that effectively assist supervisors in various aspects of their work. When considering each aspect, it was found that the web application for electronic document management for supervisors can help instructors to have more guidelines for supervision operations. Moreover, it can reduce the time required to prepare disbursement documents by allowing supervisors to view guidelines directly from the web application for managing electronic documents. The overall satisfaction with the shared drive indicates that the test users were highly satisfied with their access to the electronic document management on web application for instructors. The results of the experiment allow the researcher to take the results obtained and use the suggestions from the experimental group to improve and correct. It is also a guide for finding the proper web application for use (Omotunde & Ahmed, 2023). Considering the convenience and safety of both administrators and users, everyone can easily access it through the agency's account.

10. Acknowledgements

This research was funded by Faculty of Technical Education, King Mongkut's University of Technology North Bangkok (KMUTNB) Contract FTE-2568-12. We would like to express our sincere gratitude to the Faculty of Technical Education, King Mongkut's University of Technology North Bangkok for emphasizing this research under the support of Department of Teacher Training in Electrical Engineering, KMUTNB.

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