Development of SiapAjar as a Technology-Based System for Teacher Administration Management

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ARTICLE INFO	ABSTRACT
Keywords: Management system Teacher administration SiapAjar	**Purpose –** This research aims to develop SiapAjar as a teacher administration system designed to overcome the problem of teacher administration management that still uses traditional methods and to assess its feasibility. **Methodology –** The study employed a Research and Development (R&D) approach involving all 15 teachers from SD Negeri Sidomulyo 2 and SD Negeri Perdopo 02, along with three media experts. Data were gathered through Focus Group Discussions (FGDs) and questionnaires and then analyzed using descriptive quantitative methods to assess the application's design, functionality, and overall effectiveness. **Findings –** The results of this research are in the form of a teacher administration management application, SiapAjar, which can be accessed through web or mobile versions and includes features such as Effective Week Analysis, Annual Programs, Syllabus/Learning Objective Flow, Semester Programs, Lesson Plans, Teaching Journals, and Student Attendance Records. Validation of three experts shows an average score of 3.17 out of 4.00 on design, functionality, performance, and effectiveness, indicating the app is worth using. Meanwhile, users (teachers) gave an average score of 3.71 out of a scale of 4.00 for ease of use, efficiency and effectiveness, security and reliability, implementation support, and monitoring and evaluation, indicating that this application is feasible for teacher administration management. **Significance** — This study offers practical, efficient, user-friendly, and eco-friendly solutions for modernizing administration in educational institutions.

INTRODUCTION

Education is considered one of the main foundations for establishing a competitive and advanced community (Khalil, 2015). In a global context, education serves not only as a medium for transferring knowledge but also as a platform to shape the character and competencies of future leaders. Effective administrative management is one of the key factors in ensuring quality education, in addition to curriculum and teaching methods (Kalogiannidis et al., 2022). Teacher administration is essential in ensuring smooth teaching and learning processes in schools, encompassing lesson planning, teaching implementation, and evaluating student learning outcomes (Tito-Huamaní et al., 2024; Yang, 2024).

However, challenges to teacher administrative management exist widely in many schools. A key problem is that traditional archiving methods frequently do not keep up with technological developments (Yalagi et al., 2022). These traditional means lead to several inefficiencies, including the potential loss of documents, the inability to locate them quickly, and physical breakdown. Information technology is rapidly changing many sectors of our lives, education being no exception. Information technology also provides opportunities for improving the efficiency and effectiveness of school administration management (Deng, 2016; Idrus, 2024). Unfortunately, many schools have not effectively implemented these technologies. Many still adhere to disorganized and manual filing systems, which are challenging for teachers and school principals to monitor (Haq, 2023). Manual systems also lead to resource wastage, such as excessive paper use, large physical storage requirements, and wasted time in document retrieval. Moreover, such systems are environmentally unfriendly due to increased paper waste (Aminudin & Abinowi, 2021).

Traditional administration management is inefficient, which takes away the attention of teachers. Teachers can lose valuable time to administrative tasks, which could otherwise be spent teaching. Besides, keeping and maintaining manual filing is such a burden for teachers that they do not get easy access to the data required for evaluation and reporting, resulting in increasing workload and less time for teaching and mentoring students. Some of these challenges have an apparent solution in information technology. Digital technology offers structured data storage (Amron et al., 2017; Cicek, 2024), faster access (Ghufron, 2024), and reduced risk of document loss (Shah, 2014). Additionally, it enables system integration, allowing school principals to monitor and evaluate teacher administration performance more effectively.

Despite its potential, adopting information technology in teacher administration management is not without obstacles. Schools face challenges such as limited understanding among teachers about the benefits of technology, resistance to change, inadequate training, and infrastructure limitations, particularly in remote areas (Bećirović, 2023). These barriers prevent the optimal utilization of information technology in supporting teacher administration management. Poor administration management significantly impacts education quality (Kim, 2019). Unorganized information is due to inefficient systems that impede administration from impacting education standards positively (Syahmidi et al., 2023). For example, lost or poorly archived documents could lead to unnecessary task duplication, wasting time and energy.

Teacher administration in the education field includes a range of duties that assist in writing lesson plans and reporting on student learning outcomes. The difficulties of managing these tasks can limit the time available for teaching activities and, therefore, disadvantage students by curtailing the quality of learning. Web- and mobile-based applications may be considered solutions for improving teacher administration management. These applications help the teacher to accomplish administrative tasks effectively, providing secure and highly accessible data storage with less risk of document loss. Research has been conducted that demonstrates that IT-based applications increase the productivity of teachers, decrease administration time, and enhance data accuracy (Ayuliana et al., 2011). However, transitioning from the manual to the digital system is not always seamless. Technology adoption is also often hampered by limited training for teachers and resistance to change. Additionally, some existing applications are deemed too complicated, hampering teachers from leaving traditional techniques. This implies that the application for teacher administration management should be user-friendly.

Many teachers still use old-fashioned ways to record and save administrative data, like print-out papers and flash books. Such methods frequently cause document loss or misplacement, resulting in reworking

done by the teachers. Besides, mistakes in data recording require manual adjustments that are considered excessive time and diminish productivity (Byaruhanga, 2012). School principals also face difficulties monitoring and evaluating teacher administration without integrated systems. Manual document review can be time- and labor-intensive. It takes solutions for ease of management of teachers' administration and supports principals in supervision.

Previous research on technology-based academic management information systems shows that they can significantly improve educational services' quality (Julianti, Harahap, and Safitri 2022). This is because applying this system in vocational schools improves academic data management, grades, schedules, and teacher performance monitoring (Mayasari et al., 2021). Additionally, using the AppSheet platform for student attendance in religious-based schools has increased efficiency and accuracy in tracking student presence (Gisni, 2021). At the secondary education level, Android-based administrative applications have replaced manual methods prone to data loss, streamlining processes such as attendance tracking, assessment management, and teacher journal entries (Haddad et al., 2024). Meanwhile, the digitalization of middle schools has been proven to enhance administrative efficiency in assessment, literacy, numeracy, and character development (Suyadnya, 2024). However, applications such as SIAGUD provide some advantages, including lesser burden in administration, more ease in obtaining information, and support of professional development for teachers, especially in the planning, implementation, and evaluate the lesson (Sofyan Siregar et al., 2024). However, while these applications have demonstrated effectiveness, their features still require optimization to align with current administrative needs. Key areas for improvement include Effective Week Analysis, Annual Programs, Syllabus/Learning Objective Flow, Semester Programs, Lesson Plans, teaching journals, and student attendance records (Nurhayati et al., 2019).

To address these obstacles, this study aims to develop SiapAjar, a web and mobile-based application designed to enhance teachers' administrative management. SiapAjar was initially created by the Curriculum Team of Sekolah Indonesia Kota Kinabalu in 2022. With this application, teachers can create and store learning materials, input teaching journals, and track students' attendance effectively. It gives fast access to real-time data on active students and alums, encouraging creativity and engagement in lesson planning. SiapAjar makes it easy for school principals to monitor teachers' administration. This application has been successfully implemented at Sekolah Indonesia Kota Kinabalu and has shown positive results. Despite using a simple multi-step wizard to guide through a proven 2-click process to create a professional report, complex navigation, poor syncing of data, poor reporting features like PDF, and sub-optimal user experience and usability remind the developer of the need for improvement.

SiapAjar was developed as a web- and mobile-based teacher administration management system to fulfill the administrator's needs for both teachers and assess the system's feasibility. Developing better administrative requirements has a significant role in this research proposal, as it improves some basic administrative requirements that have not been appropriately addressed in several schools. Among the pivotal updates are better navigation, enhanced features for PDF reporting, and a commitment to optimizing user experience and usability. SiapAjar, in turn, is likely to be comprehensive in its ability to support teachers in their administrative work, as addressing these critical areas will contribute to improving overall educational administration practices.

METHODOLOGY

This study employs the Research and Development (R&D) approach based on the Borg and Gall development model (Meredith D. Gall et al., 2003). According to Sugiyono (2022), R&D aims to both validate and develop products. It is a systematic approach to creating and refining educational tools and resources (Wulandari et al., 2023). In this study, the model has been adapted into eight research stages that align with the specific objectives and interests of the research. These stages are identifying problems and potentials, data collection, product design, design validation, design revision, product testing, product revision, and dissemination, as illustrated in Figure 1.
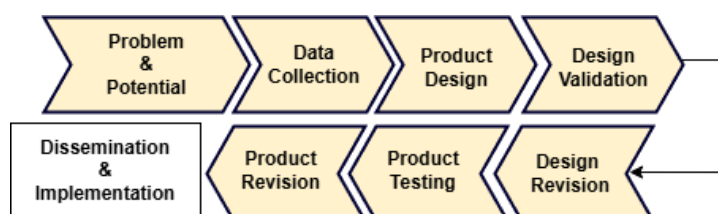
Figure 1. Research and Development (R&D) Method by Borg and Gall

The research subjects included all teachers from SD Negeri Sidomulyo 2, totaling 8, and all teachers from SD Negeri Perdopo 02, totaling 7, along with three media experts who validated the developed product. The selection of research subjects was based on feasibility and consideration of the diversity within the target population to prevent biases in the sample. Additionally, two media experts were selected from the IT faculty at Universitas Amikom Yogyakarta and one Sekolah Indonesia Kota Kinabalu ICT teacher.

The initial stage consisted of a Focus Group Discussion (FGD), a method designed to gather data from multiple participants while fostering social interaction among group members (Osman, 2023). This FGD included 15 teachers from SD Negeri Perdopo 02 and SD Negeri Sidomulyo 02, who participated on July 12-13, 2024. During the discussion, the Guttman scale was utilized to collect preliminary information regarding the development of the SiapAjar application. The Guttman scale is a measurement tool that produces interval or ratio dichotomous data with definitive Yes or no responses (Aini et al., 2019; Asih & Muslim, 2023). In this FGD, the Guttman scale checklist assigned a score of 1 for the highest response and 0 for the lowest, including ten questions, as illustrated in Table 1.

The subsequent stage included validation by three expert media, for which the instrument grids are presented in Table 2, and user feasibility testing was conducted by 15 teachers from SD Negeri Perdopo 02 and SD Negeri Sidomulyo 02, as outlined in the instrument grids presented in Table 3. The primary instrument used in both stages was a questionnaire with a rating scale of 1 to 4. A questionnaire or survey is a data collection tool comprising a series of written questions or statements respondents answer. This technique is considered adequate when researchers clearly understand the variables being measured and specific expectations regarding the respondents' answers. The questionnaire can be open-ended or closed-ended and administered directly to respondents or through other media, such as mail and the Internet (Sarica et al., 2013). The instrument was developed independently and validated by an expert lecturer from Yogyakarta State University (UNY) on 21 June 2024, receiving confirmation that the research instrument grid was created in line with the theoretical framework, allowing for further preparation of the research instrument.

Table 1. Grid of Initial Information Needs using the Guttman Scale

Code	Questions
Q1	Do you regularly create school administration documents such as Effective Week Analysis, Annual Programs, Syllabus/Flow of Learning Objectives, Semester Programs, Lesson Plans, teaching journals, and student attendance records?
Q2	Have you utilized application-based information technology as the primary tool for storing administrative data?
Q3	Do you still use traditional/manual methods for storing or archiving school administration documents?
Q4	Do you still use paper-based traditional/manual methods for creating school administration documents such as Effective Week Analysis, Annual Programs, Syllabus/Flow of Learning Objectives, Semester Programs, Lesson Plans, teaching journals, and student attendance records?
Q5	Do you often experience loss or misplacement of physical administrative documents (paper-based)?
Q6	Do you have to open files on the archive shelf one by one when searching for administrative documents?
Q7	Are these traditional/manual methods efficient for managing school administration?
Q8	Do you believe the principal has difficulty monitoring the administration created by teachers using traditional methods?

| Q9 | Do you agree that the school should start using a web or mobile-based management system for teacher administration to help manage school administration? |
| Q10 | Would implementing a web or mobile-based administrative system make work easier than manual methods? |

Note: Q1 = Question 1, Q2 = Question 2, Q3 = Question 3, Q4 = Question 4, Q5 = Question 5, Q6 = Question 6, Q7 = Question 7, Q8 = Question 8, Q9 = Question 9, Q10 = Question 10

Table 2. Expert Validation Instrument

Aspects	Indicators	Question Numbers
Design	A simple and easy-to-understand interface, intuitive application navigation, non-confusing colors, fonts, layout, and accessibility across devices.	1, 2, 3, 4
Functionality	It is easy to upload and download files, there are features for recording and tracking student attendance, you can generate PDF files, and there are search and filter features.	5, 6, 7, 8, 9
Performance	Responsiveness, time efficiency, and absence of lag.	10, 11, 12
Effectiveness	Enhances data transparency, better information management, and ease of use.	13, 14, 15

Table 3. User Feasibility Instrument

Aspects	Indicators	Question Numbers
Ease of Use	Easy to use, user-friendly, availability of usage guidelines, ability to edit data.	1, 2, 3, 4
Efficiency and Effectiveness	Time-saving, availability of administrative task features, accessible across devices, supports all school subjects, and archive management features.	5, 6, 7, 8, 9
Security and Reliability	Data security, high data accuracy, and quick and efficient resolution of technical issues.	10, 11, 12
Support and Implementation	Supported by school principals, it helps address resistance to the use of information technology.	13, 14
Monitoring and Evaluation	It enables school principals to monitor administration, integrates various data, reduces paper usage, and allows quick data access.	15, 16, 17, 18

To analyze data from the FGD results, the Guttman scale, with the following formula, is used to gather preliminary information on the development of the SiapAjar application.

$$S_i = \sum_{j=1}^{n} X_{ij} \qquad (1)$$

where,

S_i = Total score of respondents

X_{ij} = response of respondent i to question j (1 for Yes, 0 for No).

n = Number of questions

Furthermore, the data analysis method employed in this research is quantitative descriptive analysis. A Likert scale with four response options is used: Strongly Agree (score 4), Agree (score 3), Disagree (score 2), and Strongly Disagree (score 1). The evaluation by three experts and users is conducted using the following

formula.

$$\bar{X} = \frac{1}{Number\ of\ validators} \ x \ \frac{\sum X}{n} \qquad (2)$$

where,

$\bar{X}$ = Average score

$\sum X$ = Total score

n = Number of questions

The score range for each category is converted, as shown in Table 3. A standard curve is used to categorize the results into four groups, namely: (1) feasible, (2) moderately feasible, (3) less feasible, and (4) not feasible (Azwar, 2012).

Table 4. Score Ranges for Each Category

Category	Score Range
Feasible	X ≥ 3,25
Moderately Feasible	2,5 ≤ X < 3,25
Less Feasible	1,75 ≤ X < 2,5
Not Feasible	X < 1,75

FINDINGS

Product Development Process

The FGD results revealed patterns in the current school administration management. All teachers (100%) routinely prepare administrative documents such as Effective Week Analysis, Annual Programs, Syllabus/Flow of Learning Objectives, Semester Program, teaching journals, and student attendance records. However, only 13.33% of them utilize application-based information technology as the primary tool for storing administrative data. Most teachers (86.67%) still rely on traditional paper-based methods, which are used exclusively (100%). This reliance leads to several challenges, such as the risk of losing physical documents (86.67%) and inefficiency in locating records, with 93.33% of teachers having to search through files one by one manually. Although teachers are highly committed to administrative management, they agree that traditional methods are ineffective in meeting school administrative needs. Additionally, most teachers (86.67%) indicated that principals find monitoring administration conducted in this style challenging.

Despite these obstacles, there is strong support for and interest in implementing web — or mobile-based management systems, as 93.33% of teachers responding would like to adopt the systems. The report also indicates an expectation for increased convenience and security in administration management in an effort to reduce the burden on teachers and enhance the quality of oversight and control of school principals. These findings are detailed in Table 5 below.

Table 5. FGD Results on School Administration Practices and Preferences

Code	Number of "Yes" Responses	Number of "No" Responses	Yes (%)	No (%)
Q1	15	0	100.00%	0.00%
Q2	2	13	13.33%	86.67%
Q3	13	2	86.67%	13.33%
Q4	15	0	100.00%	0.00%
Q5	13	2	86.67%	13.33%
Q6	14	1	93.33%	6.67%
Q7	0	15	0.00%	100.00%
Q8	13	2	86.67%	13.33%
Q9	14	1	93.33%	6.67%
Q10	15	0	100.00%	0.00%

Based on the FGD data obtained, most teachers still administer using a traditional method and need a solution that can make it easier and simpler. Due to these findings, the SiapAjar application was introduced with three major user roles: Principal, Teacher, and Admin. Although each role has specific functions, the primary focus of application development is on the Teacher role, which is deemed to require the most practical solutions to address various administrative challenges.

To achieve this objective, the SiapAjar application leverages three key platforms: Google Sheets, Google Drive, and AppSheet. The collaboration between these platforms supports efficient data management and application development (Kusumawardhani et al., 2024), as illustrated in Figure 2.
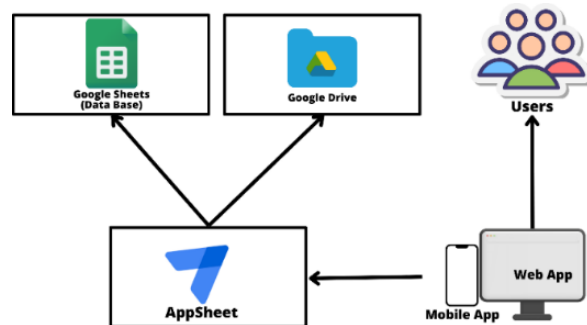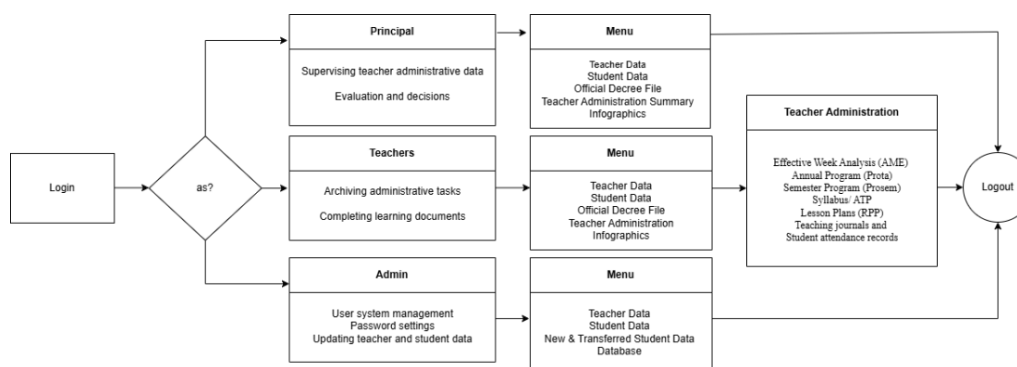

Figure 2. Development of the SiapAjar Application

Google Spreadsheet serves as the primary data source for the SiapAjar application. As a cloud-based spreadsheet tool, Google Sheets allows for adequate data storage, management, and processing. One of its key advantages is the real-time collaboration feature (Steiner, 2016), which allows multiple users to access and update data simultaneously. In developing the SiapAjar application, four spreadsheets are used to manage the data. Data for managing the SiapAjar application is divided into four spreadsheets. The first spreadsheet holds the display menu data for the application, while the second acts as the teacher database. The third spreadsheet has student data, and the fourth is for teacher administration data. This teacher administration database includes Weekly Effective Analysis, Annual Program, Syllabus/Flow of Learning Objectives, Semester Program, Lesson Plan, teaching journals, and student attendance lists. The classification is done in order to give a structured and organized format for the use of data.

Google Drive is a cloud storage and collaboration service created by Google, with millions of users worldwide (Tata et al., 2017). This allows us to store and organize several file types safely. All storage related to the SiapAjar application is stored using Google Drive. Additionally, this service assists with efficient file management and access to make the sharing and managing of the SiapAjar application database easier for the user.

SiapAjar is developed using the AppSheet platform, which enables data collection to be done digitally and accessed through various devices, including smartphones and tablets, facilitating users to interact with the application (Wilodati et al., 2024). For these types of applications, AppSheet offers a feature that allows the creation of web and mobile applications without complex programming skills (Wijesekara et al., 2020). The great benefit of this platform is that it supports multiple data sources, reduces the workload of application development, and provides numerous customizable functions according to individual requirements. This way, the shift from the manual system to the digital runs smoothly, accompanied by direct access to data to assist management (A. Kurniawan et al., 2023). Moreover, AppSheet supports direct data collection and automatically stores data, which speeds up the application development process (Haq et al., 2025).

The user roles in SiapAjar are School Principal, Teacher, and Admin, as shown in Figure 3. There are separate functions for each role in handling school administration management (Nuraisyah, Harahap, and Harahap 2021). So, this arrangement will ensure that every party can do their tasks per the teacher's administrative requirements. The following flowchart provides an overview of a fully integrated design architecture, meeting an effective and efficient flow for every user. An unequivocal and unified design system, where every part interconnects, by default maximizing every user's time spent completing tasks.

Figure 3. SiapAjar Users Flowchart

Product Validation and Development Results

Three experts carried out the validation process to ensure that the SiapAjar application meets the quality standards by the specified requirements. This validation resulted in several improvements and recommendations on specific aspects to enhance the quality of the application. Recommendations included simplifying the "Administrasi Guru" menu, relocating the student participation graph to the Infographic menu, and enabling clickable bar graphs for direct data access. Search functionality was added to the journal and attendance menus, while a "Select All" button simplified bulk attendance marking. Refined Info SK and File menus with integrated teaching schedule and validated student data. Usability improvements included showing passwords after role selection and rearranging the logout and feedback buttons in Desktop Mode. These updates were designed to respond to feedback while making the application more functional and user-friendly.

As presented in Table 6, the findings from expert validation show that the application has been rated "Moderately Feasible," with a mean score of 3.17 on a 4-point scale. At 3.47, their highest score, functionality proved to have features that users need. Design received 3.08, indicating that visual and structural elements are adequate, and performance, at 3.00, presents opportunities for improved responsiveness and stability. The application partially meets its goal, scoring 3.11 on effectiveness. While these results show strong functionality and efficiency, they also indicate many opportunities for improvement in design and performance to improve user experience.

Table 6. Data Analysis by Experts

No	Aspect	Number of Items	Total Score	Average
1	Design	4	37	3.08
2	Functionality	5	52	3.47
3	Performance	3	27	3.00
4	Effectiveness	3	28	3.11
	Overall Average			**3.17**

Figure 4 depicts average scores for all aspects and provides a regular curve overview of the data. This visualization helps to understand the distribution of expert assessments better and highlights the relative strengths and areas for improvement in the application's evaluation.
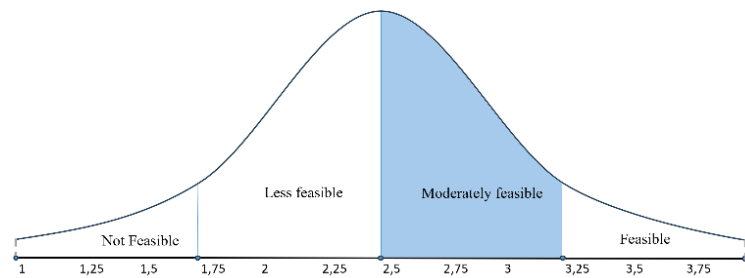
Figure 4. Average Assessment by Experts in the Form of a Normal Curve

The feasibility test was conducted with seven teachers from SD Negeri Perdopo 02 and 8 teachers from SD Negeri Sidomulyo 02. Based on the results presented in Table 7, the rating of the SiapAjar application overall was "Feasible," with an average score of 3.71 on a 4-point scale. Of all the aspects assessed, the highest number achieved was 3.89 for Efficiency and Effectiveness, indicating that it is considered a well-established application that meets users without difficulty. Security and reliability scored 3.67, indicating that users feel confident in the app's security features. The score for Monitoring and Evaluation stood at 3.73, meaning that the tools for tracking and assessing performance were helpful for users. Ease of Use was rated at 3.63, suggesting general satisfaction from users with the application's user interface. Finally, Support and Implementation received an overall 3.60 score, which shows that the support is decent but could be better in some areas.

Table 7. Data Analysis of User Feasibility

No	Aspect	Number of Items	Total Score	Average
1	Ease of Use	4	218	3.63
2	Efficiency and Effectiveness	5	292	3.89
3	Security and Reliability	3	165	3.67
4	Support and Implementation	2	108	3.60
5	Monitoring and Evaluation	4	224	3.73
	Overall Average			**3.71**

Figure 5 shows details of these results as a normal curve with an average user rating of feasibility. This graph explains the rating performance of each question, describing which part of the application succeeded in specific aspects and where it could perform better to improve user experience.
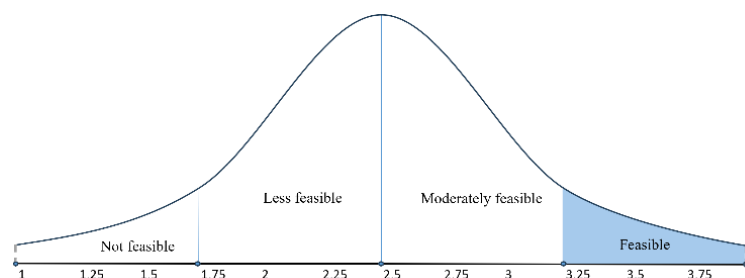
Figure 5. Average Feasibility Rating from Users on the Normal Curve

Product Revisions and Implementation

Product Revision was done to improve the quality of the resulting SiapAjar application and ensure that it complies with the expected specifications. Based on expert and user feedback, the development team focused on improving the application. These revisions aimed to crop out weaknesses and improve the user experience. The results of the revisions are shown in Table 8.
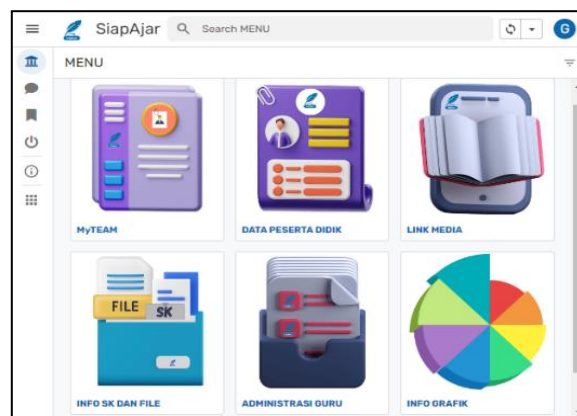
Table 8. Criteria for Improving the SiapAjar Application Based on Feedback

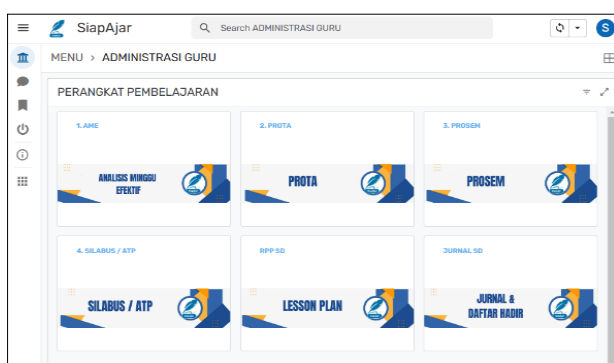| No	Source		Improvements
1	Experts	a.	Simplified the "Administrasi Guru" menu.
		b.	Moved student participation graph to infographic menu.
		c.	Clickable bar graph for direct data access.
		d.	Easier student data search in journal and attendance menus.
		e.	I added the teaching schedule to Info SK and the File menu.
		f.	"Select All" button for bulk attendance.
		g.	Student data validation.
		h.	The password is displayed after filling in 'USER ROLE.'
		i.	Moved logout and feedback buttons in Desktop Mode.
2	Users	a.	The year column in the teacher administration form is no longer mandatory
		b.	Removed the New & Transfer Students menu.

Furthermore, the outcomes of the application revisions represent the final version of the application, which has been implemented at SDN Perdopo 02 and SDN Sidomulyo 02. This implementation ensures that the improved version of SiapAjar is now actively used, benefiting teachers and enhancing their administrative processes, as shown in Figure 6.

Referring to Figure 6 above, image (1) shows that the Login and Logout Interface displays the login and logout screens that input users' credentials, with some additional features added to improve the usability of a Logout button input from users. Image (2): A collage of a main menu, which serves as a central hub for accessing teacher and student data, external links, teacher assignment letters, administration facilities, and infographics. The redesigned layout improves usability and efficiency. Image (3), the teacher administration menu, exists for academic management, such as Effective Week Analysis, Annual Programs, Syllabus/Learning Objective Flow, Semester Programs, lesson plans, teacher journals, and student attendance. Its streamlined interface makes navigation easier, data entry faster, and workload management a breeze. The above are the lesson plans that the teacher administrator should submit in the image (4) form from the teacher administration menu. This enables the teacher to create and submit the lesson plan and allows the user to generate it in PDF format. The new interface is more thorough and makes sure everything needed is right there, making creating lesson plans easy. In the image (5), the teaching journals and student attendance form allow teachers to enter attendance and journal entries with enhanced search capabilities, a "select all" button for marking attendance in bulk, and data validation for accuracy and efficiency. Finally, image (6) shows the summary screen for student data and attendance, where teachers/admin can see multiple student records and a monthly attendance graph that the school admin can use to analyze attendance trends—an interactive bar graph with detailed data in the hierarchy.

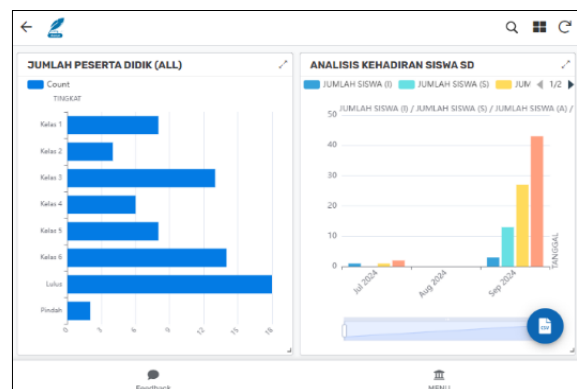(1) Login and Logout Interface

(2) Main Menu Interface

(3) Teacher Administration Menu

(4) Lesson Plan Submission Form

(5) Teaching Journal and Student Attendance Form

(6) Attendance Summary

Figure 6. The final version of the SiapAjar app with its menus and features

DISCUSSION

The findings of this study highlight the potential of the SiapAjar application discovered can assist teachers with administrative management efficiently. An analysis of teacher practices and needs has shown that traditional methods are highly time-consuming with significant manual processes, making them prone to error and environmentally unsustainable. The SiapAjar application, with features designed to streamline tasks such as Effective Week Analysis, Annual Program, Syllabus/Flow of Learning Objectives, Semester Program, Lesson Plan, teaching journals, and student attendance, provides an effective solution to these challenges, directly addressing the issues outlined in the study's introduction (Maulana, Harahap, and Safitri 2022).

The novelty of this study is the combination of user-centered technology specifically for educators' administrative problems. The system used by SiapAjar is digital, accessible, and efficient, thus minimizing the workload for teachers to arrange learning schedules and focus more on the quality of learning

(Nurdadyansyah et al., 2024). Previous studies showed technology's influential role in enhancing the education process's management (Anggraeni et al., 2024; B. Kurniawan, 2019). Unlike previous tools, SiapAjar focuses on usability, device compatibility, and independence from high-resource dependencies, presenting significant improvements over conventional approaches (Kusumawardhani et al., 2024).

The results also strengthen the broader generalization of digital transformation boundaries to the field of education from a theoretical perspective. They claim that administrative efficiency is among the determining variables for improved teacher productivity and the quality of educational processes (Kalogiannidis et al., 2022). In addition, the findings correlate with the RBV (Resource-Based View) theory, which states that successful organizations leverage the optimal use of their internal resources, such as technology and humans (Ahn et al., 2022). However, the absence of good infrastructure and the low digital literacy of users are forcing us to rethink the application's utility and develop targeted solutions in training and capacity building to take advantage of its applicability.

The SiapAjar application successfully addresses the research questions and objectives by demonstrating how a customized digital solution can mitigate educators' administrative challenges. It provides principals with enhanced oversight capabilities and reduces reliance on paper-based systems, contributing to sustainability goals (Al Jaberi et al., 2022). SiapAjar differs from existing systems by providing a merged-integrated administration system with demonstrated and practical implementations.

The implications of these findings for educational policy and practice are also profound. SiapAjar's design aligns with global trends in digitization and sustainability while utilizing technological adoption to impact support responses for administrative purposes (Yalagi et al., 2022). The application's success highlights an important facet of developing solutions and working with end-users to ensure a real-world perspective that fits practical needs. In addition, the findings emphasize the need for further investment in infrastructure and professional development programs to support the adoption of technologies in resource-limited and remote settings.

However, this study has some limitations. It is limited to only some teachers and schools. There are also scalability limitations due to the reliance on cloud storage at no cost due to the free tier of Google Drive with a capacity of 15 GB (Mohd Salleh & Hussain, 2021). Limitations in customization and personalization also hinder further development of the AppSheet platform (Al Alamin et al., 2021). Future studies could address these limitations by recruiting a broader and more diverse sample and assessing the durability of such applications (Indrasvari, Harahap, and Harahap 2021). The increased scalability and flexibility will be essential for determining whether SiapAjar can cater to various educational settings.

CONCLUSION

The development of the SiapAjar as a teacher administration management solution was carried out using a Research and Development (R&D) approach. The process included identifying problems, data collection, product design, design validation, design revisions, product trials, product revisions, and mass production. This application is designed to support the management of teachers' administrative tasks, including Effective Week Analysis, Annual Program, Syllabus/Flow of Learning Objectives, Semester Program, Lesson Plan, teaching journals, and student attendance. SiapAjar is accessible through both web and mobile platforms, providing convenience in digital administration management. The trial subjects were at SD Negeri Sidomulyo 2 and SD Negeri Perdopo 02, and data were collected through Focus Group Discussions (FGD) and product evaluation. The findings showed that the application meets the teachers' administrative needs remarkably. Teachers' involvement throughout the trial demonstrated an urgent need for a digital application such as SiapAjar to improve administrative roles. Expert validation results were conducted on four aspects: design, functionality, performance, and effectiveness. The 3.17 average validation score on a 4-point scale suggests that the application is deemed "Moderately Feasible" in terms of use. The user trial received an average score of 3.71 out of 4, showing that the application is "Feasible" based on metrics in ease of use, support for administrative tasks, data security, implementation, and monitoring and evaluation. From this, it can be confirmed that SiapAjar is a viable and suitable application for managing administration in educational

institutions.

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