Jurnal Elektronika dan Teknik Informatika Terapan (JENTIK)
Volume 4 Nomor 3 September 2026
e-ISSN : 2988-0874; p-ISSN : 2988-0866, Hal 199-228
DOI: https://doi.org/10.59061/jentik.v4i3.1512
Tersedia: https://e-journal.poltek-kampar.ac.id/index.php/JENTIK

Design of a Web-Based Accounting Information System to Improve Transparency and Accountability

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Abstract. *Schools have a responsibility to manage their finances in accordance with applicable financial management principles, such as transparency, accountability, fairness, and efficiency. At Sutera State High School No. 2, financial management involves various funding sources allocated to a number of budget items, thus requiring an integrated and structured management system. To support cash flow control and the provision of accurate and timely financial information, an information system is needed that can generate financial reports in real time and be accessed by authorized decision-makers. This study aims to design a web-based accounting information system that can support the school's budget management and implementation processes. The method used was the research and development (R&D) approach, employing the waterfall system development model. After the system design and testing phases were completed, the researchers collaborated with school officials to provide training and guidance on using the system. The research results show that the web-based financial information system developed simplifies cash flow management for financial staff and allows the principal to access financial reports directly. Thus, the designed system supports the realization of more transparent, effective, and accountable financial management at Sutera State High School No. 2. In addition to making it easier to prepare financial reports, this system also helps minimize data entry errors and speeds up the process of presenting financial information. It is hoped that this web-based accounting information system will serve as a solution to support more modern, efficient, and sustainable school financial management.*

Keywords: *Accounting Information System, School Financial Management, Web-Based Information System Financial Reporting, Waterfall Development Model.*

Abstrak. Sekolah memiliki tanggung jawab untuk mengelola keuangan sesuai dengan prinsip-prinsip pengelolaan keuangan yang berlaku, seperti transparansi, akuntabilitas, keadilan, dan efisiensi. Di SMA Negeri 2 Sutera, pengelolaan keuangan melibatkan berbagai sumber dana yang dialokasikan ke sejumlah pos anggaran, sehingga memerlukan sistem pengelolaan yang terintegrasi dan terstruktur. Untuk mendukung pengendalian arus kas serta penyediaan informasi keuangan yang akurat dan tepat waktu, diperlukan sistem informasi yang mampu menghasilkan laporan keuangan secara *real-time* dan dapat diakses oleh pihak pengambil keputusan yang berwenang. Penelitian ini bertujuan untuk merancang sistem informasi akuntansi berbasis web yang dapat mendukung proses pengelolaan dan pelaksanaan anggaran sekolah. Metode yang digunakan adalah pendekatan penelitian dan pengembangan (*Research and Development* atau R&D) dengan menerapkan model pengembangan sistem *waterfall*. Setelah tahap perancangan dan pengujian sistem selesai, peneliti bekerja sama dengan pihak sekolah untuk memberikan pelatihan dan panduan mengenai penggunaan sistem tersebut. Hasil penelitian menunjukkan bahwa sistem informasi keuangan berbasis web yang dikembangkan mempermudah pengelolaan arus kas bagi staf keuangan dan memungkinkan kepala sekolah untuk mengakses laporan keuangan secara langsung. Dengan demikian, sistem yang dirancang ini mendukung terwujudnya pengelolaan keuangan yang lebih transparan, efektif, dan akuntabel di SMA Negeri 2 Sutera. Selain mempermudah penyusunan laporan keuangan, sistem ini juga membantu meminimalkan kesalahan input data dan mempercepat proses penyajian informasi keuangan. Diharapkan sistem informasi akuntansi berbasis web ini dapat menjadi solusi untuk mendukung pengelolaan keuangan sekolah yang lebih modern, efisien, dan berkelanjutan.

Kata kunci: Sistem Informasi Akuntansi, Manajemen Keuangan Sekolah, Sistem Informasi Pelaporan Keuangan Berbasis Web, Model Pengembangan Waterfall.

Naskah Masuk: 04 Agustus 2026; Revisi: 12 Agustus 2026; Diterima: 24 Agustus 2026; Terbit: 01 September 2026

1. INTRODUCTION

Education is a crucial aspect in enhancing an individual's quality. This is in line with the mandate of Law No. 20 of 2003 on the National Education System, which states that education is a conscious and planned effort to create a learning environment and learning process that enables students to play an active role in developing their potential. Through education, students are expected to be able to build spiritual and religious strength, exercise self-control, develop good character, enhance their intelligence, possess noble moral values, and master various skills that are beneficial to themselves, the community, the nation, and the state. Education is a conscious and planned effort to develop the potential of students through a directed learning process, as mandated by Law No. 20 of 2003 on the National Education System. As an investment in human resource development, the provision of education requires adequate financial support. According to Government Regulation No. 48 of 2008, education funding is the provision of financial resources necessary to support the implementation and management of education. Thus, financial management is a key component of school administration, serving to manage funding sources effectively, efficiently, transparently, and accountably. Financial management is one of the key aspects of management, carried out through the stages of planning, organizing, directing, coordinating, supervising, and controlling (Huasada & Nandra, 2026). The implementation of educational financial management must be guided by the principles of transparency, accountability, effectiveness, and efficiency. Transparency in educational financial management reflects the openness of information regarding all financial activities from funding sources and the process of fund utilization to the submission of accountability reports thereby fostering sound and accountable financial governance. Accountability in educational financial management means that all use of educational funds must be accountable in accordance with previously established plans and regulations. Meanwhile, the principle of effectiveness in financial management is reflected in an institution's ability to allocate and utilize financial resources to support various activities aimed at achieving organizational goals. Financial management is considered effective if the results obtained align with the planned targets and the quality of the intended outcomes. On the other hand, efficiency in educational activities can be seen in an institution's ability to optimally utilize available resources such as time, labor,

and costs to produce maximum outputs, both in terms of quality and quantity (Sopian et al., 2025).

A number of previous studies have examined the effectiveness of implementing accounting information systems. One study found that the implementation of an information system in the management of School Operational Assistance (BOS) funds can improve the effectiveness and efficiency of the financial reporting preparation and collection processes. This is because all financial data and reports can be stored centrally in a web-based system, making them easier to access and manage (Yudhistira et al., 2023). Further research on the design and development of web-based accounting information systems shows that the resulting systems can assist financial administrators in automatically generating financial reports via a web platform, thereby making the reporting process easier and more efficient (Thiovanda, 2025). Additionally, another study on web-based course grade transparency information systems resulted in a system that provides reports openly and makes them accessible to all students. This system supports increased information transparency through the use of web-based technology (Thiovanda, 2025). The fourth study, which examined the impact of transparency in financial reporting, showed that the level of transparency has a significant impact on the quality of the resulting financial statements. The application of sound transparency principles can enhance the reliability, openness, and quality of the financial information (Fauzi et al., 2026). Furthermore, the fifth study on the evaluation of accounting information systems reveals that the implementation of such systems can produce accurate and accountable financial information, thereby supporting the decision-making process and improving the quality of an organization’s financial management (Tan, 2026). Financial statements are a medium for presenting information about an organization’s financial condition and performance during a specific period. The information contained therein can be further analyzed to generate useful data as a basis for decision-making. Therefore, financial statements must be prepared systematically, containing all relevant financial information and adhering to established procedures and standards. Preparation in accordance with standards allows financial statements to be compared across periods and between organizations, ensuring that the results of the analysis are highly accurate and reliable.

Sutera State High School No. 2 has utilized computer technology in managing its financial reports by recording all revenue from various sources, as well as expenditures both routine and incidental in a cash book and processing the data using Microsoft Excel. However, the current system still has several limitations, such as the potential for errors in the preparation of financial reports, slow access to information for stakeholders, and suboptimal transparency in financial management. Therefore, an integrated financial information system is needed to support the management of the school's financial data in a more accurate, faster, and transparent manner in accordance with user needs. The purpose of this study is to develop a web-based accounting information system application to improve transparency and accountability in financial data management. Website technology has been widely adopted in various fields. Web-based information systems have proven capable of supporting the effectiveness of financial record-keeping, such as in the financial management of BUMDes (Anisa & Yulindo, 2026). Furthermore, the use of websites as a medium for providing information is considered effective based on several quality dimensions, particularly in terms of accountability, which encompasses interactivity, transparency, and the usefulness of information (Brilliant & Nurhasanah, 2026). Through the implementation of this application, financial report information can be presented in an open, comprehensive, and accountable manner. This is expected to enhance mutual trust among stakeholders and minimize potential irregularities in the use of funds at an early stage. In addition, this study is also expected to improve the effectiveness and efficiency of the financial reporting process, particularly in recording inflows and outflows of funds, so that the resulting reports are more accurate, transparent, and accountable.

Although previous studies have demonstrated the benefits of web-based information systems in improving financial management, reporting efficiency, and transparency, several limitations remain. Previous research has primarily focused on specific functions, such as managing School Operational Assistance (BOS) funds, automating financial report generation, or providing web-based financial information. These studies demonstrate that digitalization can improve accessibility, accuracy, and efficiency, but they do not comprehensively address the integration of transaction recording, supporting-document management, financial monitoring, role-based access control, and direct access to financial reports within a school financial management environment. In addition,

previous studies have not specifically emphasized the integration of financial transaction management with real-time monitoring by school principals while maintaining different levels of authority between financial administrators and decision-makers.

This gap is particularly relevant at SMA Negeri 2 Sutera, where financial transactions were previously recorded using cash books and Microsoft Excel. This condition created risks of recording errors, delays in report preparation, and limited access to financial information for stakeholders. Therefore, a system is required not merely to digitize financial records, but also to integrate financial data management, transaction documentation, monitoring, and reporting into a single web-based platform that reflects the different responsibilities of school financial administrators and decision-makers.

The novelty of this study lies in the development of an integrated web-based accounting information system specifically designed for school financial management at SMA Negeri 2 Sutera. Unlike previous systems that emphasize particular financial functions, the proposed system integrates three user roles administrator, treasurer, and principal with differentiated access rights. The system combines revenue and expenditure management, digital upload of transaction receipts, automatic transaction receipts, financial summaries, cash-balance monitoring, dashboard-based visualization, and periodic financial reporting that can be generated in PDF and Microsoft Excel formats.

Furthermore, the proposed system provides the principal with direct access to monitor revenue, expenditures, and financial reports without waiting for manually prepared reports from the treasurer. At the same time, the principal does not have permission to modify or delete financial data, thereby separating monitoring authority from transaction-management authority. Thus, the novelty of this research is not simply the adoption of web technology, but the integration of role-based financial management, transaction evidence, real-time financial monitoring, and automated periodic reporting into a single school-specific accounting information system. This integrated approach is intended to strengthen transparency and accountability while improving the accuracy, efficiency, and accessibility of school financial information.

2. LITERATURE REVIEW

The dynamics of information technology have a significant impact on organizational governance, particularly in the accounting and finance sectors. To make strategic and

effective decisions, management today is required to present financial data quickly, accurately, and transparently. Therefore, the Accounting Information System (AIS) serves as a vital tool that systematically integrates the processes of documenting, processing, storing, and reporting financial data. The AIS is defined as a structured mechanism responsible for collecting, processing, and storing financial data to provide valuable information to decision-makers (Arfan & Pekei, 2024). The functions of an Accounting Information System (AIS) are not limited to merely documenting transactions; rather, it also serves as an internal control instrument and a managerial support tool in executing planning, monitoring, and evaluating organizational performance (Brilliant & Nurhasanah, 2026). Through an integrated system, financial data processing can operate more efficiently to minimize the risks of human error, data loss, and reporting delays which are often weaknesses in manual methods. Therefore, the implementation of an AIS is a strategic priority for organizations committed to comprehensively improving the quality of their governance and financial management (Melinda et al., 2021).

A number of empirical studies confirm that the implementation of an Accounting Information System (AIS) contributes positively to improving the quality of financial statements. Through computerized mechanisms, the accuracy, time efficiency, and reliability of the information presented can be optimized, thereby producing a robust database for strategic decision-making (Abdurrachman et al., 2026). In addition to improving the quality of reporting, the use of information technology can also boost an organization's operational efficiency by eliminating repetitive administrative workloads (Elizabeth & Ismail, 2021).

The transformation of internet technology has shifted the paradigm of Accounting Information Systems (AIS) from desktop-based applications to web-based systems that facilitate online data accessibility. This mechanism integrates internet infrastructure as the primary medium for managing and distributing financial information to stakeholders. A key feature of this web-based architecture is its ability to be accessed without time or location restrictions, as long as there is an internet connection (Setiani et al., 2022).Compared to conventional models, web-based AIS offers far greater flexibility through centralized data storage on servers, which in turn simplifies real-time data management and monitoring processes. Additionally, this system supports cross-

departmental data integration within an organization, effectively reducing data duplication and enhancing the consistency of the information produced (Putri & Kamisutara, 2026). A number of previous studies have confirmed that the implementation of web-based information systems is effective in optimizing financial data management through the automation of the entire process chain, from transaction recording and data processing to the preparation of financial reports (Elizabeth & Ismail, 2021). This automation not only reduces operational time but also minimizes the risk of human error. Therefore, web-based MIS serves as a highly relevant alternative solution for entities that require the presentation of financial information that is fast, precise, and highly accessible.

Public accountability and the success of good governance depend heavily on the enforcement of the principle of transparency. This principle emphasizes an entity's commitment to openness in disseminating relevant, accurate, and highly accessible information to all stakeholders (Ariwibowo & Wantoro, 2025). In the realm of financial management, transparency is manifested through the preparation and presentation of financial statements that are comprehensive, explicit, and easily interpretable by stakeholders (Saputra & Hanifa, 2026). The urgency of public information disclosure is now on the rise, in line with the public's growing demands for transparency. Entities that consistently adopt this principle tend to successfully build legitimacy and achieve a stronger level of trust, both from the public and from external stakeholders. Conversely, a lack of transparency has the potential to trigger various negative consequences, such as the misallocation or misuse of budgets, a decline in public trust, and suboptimal oversight of the organization's internal resource utilization (Widoyoko et al., 2026).

The implementation of a web-based Accounting Information System (AIS) plays an essential role in promoting institutional transparency through the transparent and easily accessible presentation of financial data. This digital mechanism facilitates regular and dynamic (real-time) data updates, enabling stakeholders to obtain information that is not only up-to-date but also accurate. Furthermore, the integration of reporting features and digital documentation significantly simplifies and strengthens the monitoring process for all of the organization's financial activities (Nisa & Hadi, 2026).

In addition to transparency, another crucial pillar of an organization's financial governance is accountability. This concept refers to an entity's moral and legal obligation

to be accountable for all policies, actions, and allocations of managed resources to parties who have authority or a right to such information. In the realm of financial management, accountability is demonstrated through the preparation of financial statements that comply with applicable accounting standards and whose governance can be verified as valid (Marwan & Kuswanto, 2022). The relationship between transparency and accountability is symbiotic and complementary. While transparency plays a role in providing access to data and information, accountability ensures that the validity of all the data presented can be verified. On that basis, the synergy between these two principles serves as a crucial foundation for building ideal organizational governance (good governance) (Vidi & Septanto, 2025).

Organizational accountability can be optimized through the implementation of a web-based Accounting Information System (AIS), which facilitates the systematic documentation of data within an integrated database. The audit trail feature in this system ensures that every transaction is properly recorded, thereby facilitating traceability, oversight, and report auditing. Through these digital control mechanisms, the potential for financial data manipulation and budget misallocation can be significantly reduced. A consensus among various empirical studies confirms a strong correlation between the implementation of web-based Accounting Information Systems (AIS) and increased institutional transparency and accountability. Through an integrated system infrastructure, financial information can be presented in a timely and precise manner, ensuring data readability for authorized parties. This efficient accessibility fosters a climate of openness in financial management, while data accuracy and traceability serve as key pillars in strengthening organizational accountability.

In addition, this web-based architecture facilitates automation in the reporting process, thereby eliminating delays in the preparation of financial reports. The availability of up-to-date and accurate financial data enables management and organizational leaders to make strategic decisions more effectively. At the same time, this mechanism also strengthens social control functions, allowing the public and stakeholders to monitor budget allocation and utilization more effectively (Shabrina & Fauzi, 2026). In the education sector, particularly in schools, the need to ensure transparency and accountability in financial management has become increasingly critical due to the diverse sources of funding that require responsible management (Sulis & Yanto, 2025).

To address these challenges, the development of a web-based Accounting Information System (AIS) serves as a strategic solution to optimize the quality of school financial management. The implementation of this system is projected to provide precise, highly accessible, transparent, and accountable financial reporting to achieve more ideal financial management in educational institutions.

3. METHODS

This study was conducted at Sutera State Senior High School No. 2 using the research and development (R&D) method. This method is a research approach aimed at creating new products or improving existing ones so that they can provide greater benefits. In research and development, there are two main types of approaches that can be applied: development focused on the product design and testing process, and development that emphasizes the evaluation of previously conducted programs. This model was chosen because it features clear, structured, and systematic stages, making it well-suited to support the achievement of research objectives and provide optimal solutions to the research problems at hand.

The needs analysis stage involved more than three informants who were selected based on their involvement and knowledge of school financial management and information needs. The informants consisted of the school principal, teachers, and administrative staff at Sutera State Senior High School No. 2. The school principal was interviewed to identify managerial and monitoring needs related to financial information, reporting, transparency, and accountability. Meanwhile, teachers and administrative staff were involved to obtain information regarding the existing financial administration process, data recording practices, supporting documents, and the difficulties encountered in managing and accessing financial information. Data were collected through direct observation and semi-structured interviews. The information obtained from these informants was subsequently analyzed to identify user needs and formulate the functional requirements of the proposed web-based accounting information system, including user roles, access rights, transaction management, financial monitoring, and reporting features. Research and development is an approach that has been widely adopted in various fields due to its effectiveness in producing products that meet user needs. In this study, the

Waterfall model was used as a framework for the system development process. This model consists of systematically organized and sequential phases, as shown in Figure 1.

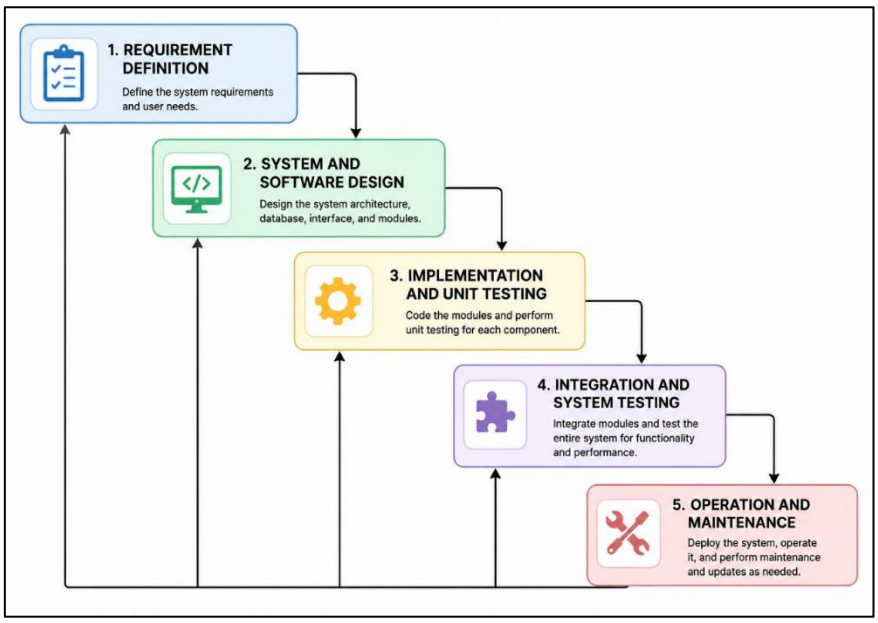


Figure 1. Waterfall Software Development Life Cycle (SDLC)

4. RESULTS

Requirements Definition

During the requirements analysis phase, several activities were carried out to gain an understanding of the system to be developed. The first step was to study the financial management processes currently in place at Sutera State High School No. 2, particularly regarding the recording of school revenue and expenditures. Next, various constraints in the current system were identified, including the fact that financial management is still carried out manually using cash books and supported by Microsoft Excel, which creates the potential for recording errors, delays in report preparation, and difficulties in managing financial data.

Based on the results of this identification, the next step is to determine the system requirements as the basis for the design process. These requirements are determined through observation and interviews with parties involved in school financial management. The results of this process are used to formulate the system's functional requirements, including determining the access rights and roles of each user in operating the information system to be developed. Details of these functional requirements are presented in Table 1.

Table 1. Results of the System Functional Requirements Analysis

Number	Parameter	Description
1	Login Page	The system can be accessed by three types of users: administrators, treasurers, and school principals, with each user having access rights tailored to their duties, functions, and authority
2	Page Dashboard	Presents information on financial income and expenses in the form of charts, accompanied by numerical data, to facilitate monitoring and analysis.
3	Revenue Management Page	The system provides functions for managing school revenue data, including data entry, data updates, transaction recording, and the presentation of structured revenue summaries.
4	Expenditure Management Page	Provides information about the school's cash balance in the form of a chart, making it easier for users to monitor the school's financial status.
5	Cash Balance Page	The system presents information about the school's cash balance in the form of charts, making it easy for users to monitor the school's financial status quickly and effectively.
6	Report Print Page	The system provides a financial report printing menu that allows users to generate structured, print-ready reports based on monthly or annual periods.

1. Login Page

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2. Page Dashboard

   Presents information on financial income and expenses in the form of charts, accompanied by numerical data, to facilitate monitoring and analysis.

3. Revenue Management Page

   The system provides functions for managing school revenue data, including data entry, data updates, transaction recording, and the presentation of structured revenue summaries.

4. Expenditure Management Page

   Provides information about the school's cash balance in the form of a chart, making it easier for users to monitor the school's financial status.

5. Cash Balance Page

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6. Report Print Page

   The system provides a financial report printing menu that allows users to generate structured, print-ready reports based on monthly or annual periods.

System and Device Design Phase

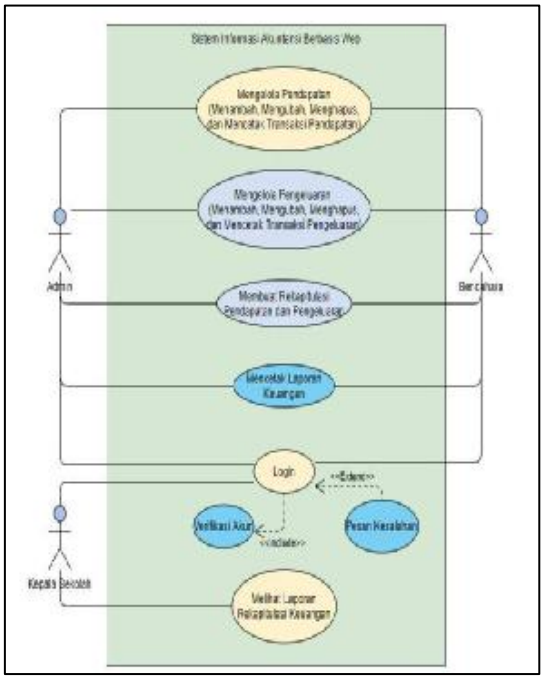


Figure 2. System and Device Design Phase

a. Administrator and Treasurer

The use case diagram illustrates the various functions or activities that each actor in the system can perform. Each actor—the administrator and the treasurer—has different access rights based on their roles and responsibilities in managing the information system. The administrator and treasurer have equal access rights regarding the management of the school’s financial data. Both are authorized to add, update, and delete transaction data related to both revenue and expenditures. In addition, the administrator and treasurer can also compile financial summaries and print transaction reports and financial statements as needed.

b. School Principal

In a web-based accounting information system, the school principal has access rights to directly view and monitor financial reports prepared by the treasurer. The availability of real-time information allows the school principal to access financial data at any time without having to wait for reports to be submitted manually, enabling faster and more accurate decision-making.

Implementation of the System and Unit Testing Processes

This stage involves implementing the system design into the selected programming language. Once the development process is complete, initial testing (trial and error) is conducted to identify and correct any errors (debugging) still present in the accounting information system before functional testing is performed in the next stage.

System Integration and Testing Phase

At this stage, the integration and implementation of the information system were carried out to ensure that the developed system could meet the needs of users at Sutera State High School 2. Integration was carried out by deploying the completed web-based application, followed by training sessions on how to use the system for the school treasurer and principal. In addition, a simulation of the system's use was conducted to evaluate the suitability of the available functions with the user needs identified during the analysis phase. The evaluation results were used as the basis for refining the system. After undergoing two rounds of testing and adjustments, the information system was deemed to meet user needs and was subsequently implemented at Sutera State High School 2. During the implementation phase, the research team continued to provide guidance and conduct monitoring to ensure the system could be operated optimally in accordance with the established objectives.

System Operation and Maintenance Phase

After undergoing a development and testing process, the information system—which met user needs was subsequently implemented at Sutera State High School 2 as the research site. This implementation aimed to evaluate the system's performance in supporting school financial management and to ensure that all available functions aligned with the research objectives. The evaluation results were used as a basis for maintaining and refining the system if any shortcomings were found or if further development was needed.

The results of the implementation of the developed information system are presented in the following section.

a. User Authentication Page

The system implements an authentication mechanism through a login page that can only be accessed by three user groups: the administrator, the treasurer, and the principal. The differences in access rights for each user are designed based on their respective duties and responsibilities, so that each user can only access features that correspond to their authority. The administrator acts as the user with the highest level of authorization and has control over the entire financial data management process within the system. The treasurer has access rights to manage all cash flow data available in every menu within the information system. These authorities include managing transactions related to school revenue and expenditures. Meanwhile, the principal is granted access only to view cash balance information, revenue and expenditure transaction data, and to print financial reports. The principal's access rights are limited, so they cannot add, modify, or delete financial data stored in the system. The system's login page is shown in Figure 3.



Figure 3. User Authentication Page

The login page is the first screen that appears when a user opens the Financial Monitoring Application. On this page, users are required to enter their registered username and password to access the system. Additionally, there is a "Remember Me" feature that allows login information to be saved so that users do not need to re-enter their authentication data when using the same device in the future. After all data has been entered correctly, users can click the Login button to begin the verification process. If the information provided matches the data stored in the system, users will be redirected to the main page (dashboard) based on their access rights. Thus, the login page serves as an

initial security layer designed to ensure that only authorized users can access and manage financial data within the application.

b. Home Page Layout

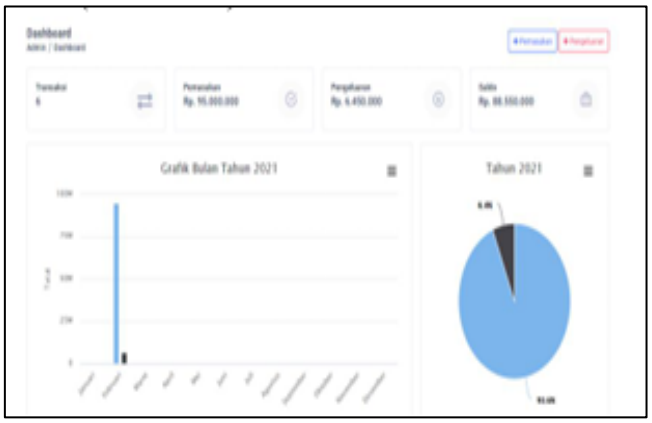


Figure 4. Home Page Display

The home page (dashboard) is the main interface displayed after a user successfully completes the authentication process in the Financial Monitoring Application. This page is designed to present financial information in a concise and integrated manner so that users can quickly get an overview of their financial status. At the top of the page, several key indicators are displayed, including the number of transactions, total income, total expenses, and balance all of which support the financial monitoring process. Additionally, there are Income and Expenses buttons to help users easily add transaction data according to their type.

c. Revenue Information Page

1. The process of adding and updating revenue types



Figure 5. Revenue Type Data Management Page

The page for adding and modifying revenue types serves as an interface for managing revenue category data used in the financial transaction recording process. Through this page, users can add new revenue categories or update information for categories already stored in the system. There are two main fields that must be filled out: Code and Category Name. The Code field serves as a unique identifier for each revenue category, while the Category Name field is filled with the category's full name, such as School Operational Assistance (BOS). After all data has been entered or updated, users can click the Save button to save the changes to the database. Conversely, if the user decides to cancel the data management process, the Close button can be used to close the page without saving any changes made. This feature is designed to support more systematic management of revenue categories so that the data used in transaction recording and financial reporting remains consistent, valid, and easy to manage.

2. Adding income data

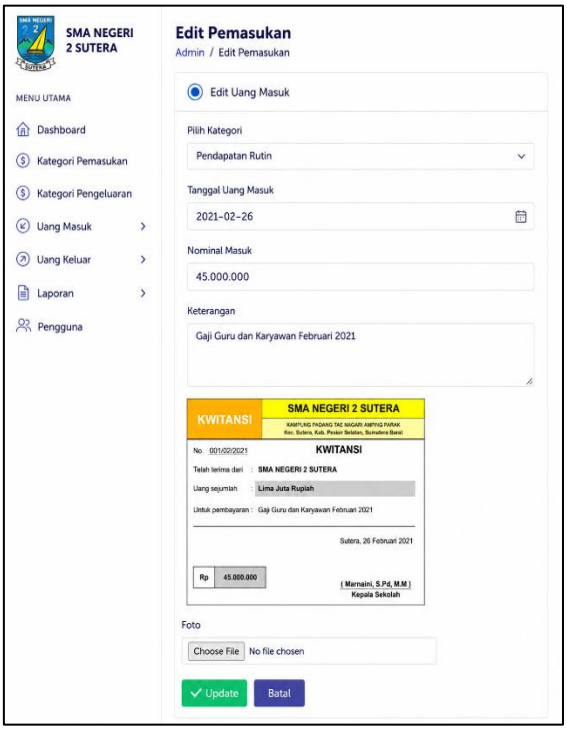


Figure 6. Adding income data

Figure 6 shows the revenue data entry page interface, which serves as a means of inputting cash receipt transactions. Users can enter information such as revenue category, transaction date, receipt amount, and relevant notes. The system also supports the upload of transaction receipts to validate the entered data. All information entered will be saved

to the database after the user clicks the Save button, so it can be used in integrated financial reporting and management processes.

3. Proof of Revenue Receipt


KWITANSI

NEGERI 2 SUTERA

KAMPUNG PADANG TAE NAGARI AMPING PARAK, Kec. Sutera, Kab. Pesisir Selatan, Sumatera Barat.

NO. 15123

KWITANSI

Telah terima dari : Dinas Pendidikan Kab. Bengkalis

Uang sejumlah : # Empat Puluh Lima Juta Rupiah #

Untuk Pembayaran : Pelunasan Produk ACB seri A123 sebanyak 2 buah (Invoice No. F6/060)

Bengkalis, 22 Februari 2021

Rp 45.000.000

(Muhammad Helmi)
Bendahara

Figure 7. Proof of revenue transactions

Figure 7 shows the revenue transaction receipt generated by the system as the output of the fund receipt recording process. The transaction receipt is presented in the form of a receipt containing information regarding the transaction number, the donor's identity, the amount received in numeric and written form, the purpose of the payment, the transaction date, and the treasurer's approval. All of this information is stored as supporting documentation that can be used for administrative, verification, and audit processes. The digitization of these transaction records helps improve the reliability of financial record-keeping, maintain data integrity, and support the implementation of the principles of transparency and accountability in school financial management.

d. Expenditure Information Page

1. Expense Type Management Page



Figure 8. Expense Type Management Page

2. List of Expense Categories



Figure 9. List of Expense Categories

The expense data information page displays all expense transaction data stored in the system. On this page, users can view information such as the transaction number, transaction date, expense category, amount, and description for each recorded expense. Additionally, a search feature is available to help users find specific data, along with an "Add Data" button to record new expense transactions. The system also provides "Edit" and "Delete" buttons so that users with the appropriate access rights can update or delete expense data as needed. With this page, the process of managing and monitoring expense transactions becomes more structured, accurate, and efficient.

3. Additions and Updates to Expenditure Data

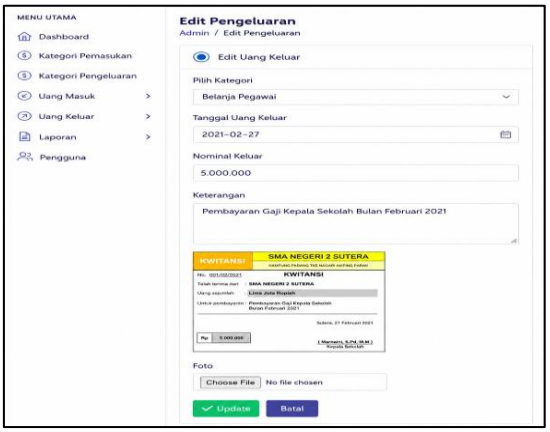


Figure 10. Additions and Updates to Expenditure Data

Figure 10. Expense Data Edit Page. This page is used to update expense transaction data that has been saved in the system. Users can change the expense category, transaction date, amount, and description, as well as upload transaction receipts. Once all changes have been made, the data can be saved by clicking the "Update" button, ensuring that expense information remains accurate and well-documented, and supports transparent and accountable financial management.

4. Supporting documents for expenditure transactions.



KWITANSI

NEGERI 2 SUTERA

KAMPUNG PADANG TAE NAGARI AMPING PARAK,
Kec. Sutera, Kab. Pesisir Selatan, Sumatera Barat.

NO. 15123

KWITANSI

Telah terima dari : Dinas Pendidikan Kab. Bengkalis

Uang sejumlah : # Empat Puluh Lima Juta Rupiah #

Untuk Pembayaran : Pelunasan Produk ACB seri A123 sebanyak 2 buah (Invoice No. F6/060)

Bengkalis, 22 Februari 2021

Rp 45.000.000

(Muhammad Helmi)
Bendahara

Figure 11. Supporting documents for expenditure transactions

Figure 11. Proof of Expense Transaction. This page displays the expense transaction receipt generated by the system as valid proof of the recorded transaction. The receipt contains information regarding the transaction number, recipient's identity, expense amount, payment description, transaction date, and approval by the authorized party. This transaction receipt can be printed and used as supporting documentation in the processes of archiving, reporting, and financial auditing, thereby enhancing the transparency and accountability of fund management.

e. Summary Menu

1. Revenue Summary Page



Figure 12. Revenue Summary Page

Figure 12. Revenue Summary Page. This page displays a list of all revenue transactions recorded in the system in tabular form. The data displayed includes the transaction number, date, revenue category, amount, and transaction description. The system also provides features for searching, adding, editing, deleting, and printing revenue data. With these features, users can manage revenue data in a more structured, accurate, and efficient manner, thereby supporting the preparation of financial reports that are transparent, accountable, and easily accessible.

2. Summary report of expenses



Figure 13. Summary report of expense

The Expense Data page serves as a platform for managing all school expense transaction data in an integrated manner. On this page, the system displays transaction information in a table format that includes the transaction number, date, expense category, amount, description, and action buttons for each entry. Additionally, a search feature is available, allowing users to find expense data more quickly and easily. Users can also add new transactions using the Add Data button, as well as edit or delete data using the Edit and Delete buttons available on each transaction row. With these features, expense data management becomes more effective, efficient, and well-documented, thereby supporting the preparation of accurate, transparent, and accountable financial reports.

3. Cash Balance Information Page

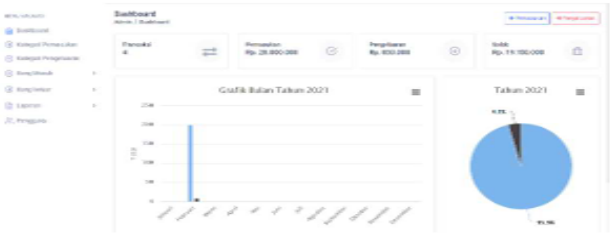


Figure 14. Cash Balance Information Page

The dashboard page is the main interface displayed after a user successfully logs into the system. This page provides a summary of financial information, including the number of transactions, total revenue, total expenses, and available cash balance. In addition, the system presents data visualizations in the form of bar charts and pie charts to illustrate trends and the proportions of financial transactions based on specific periods. This visual presentation of information makes it easier for users to monitor financial conditions, analyze transaction data, and support quick, accurate, and data-driven decision-making. Thus, the dashboard serves as an effective monitoring tool to enhance transparency and accountability in financial management.

f. Report Printing Features

1. Print reports based on the selected month and year.

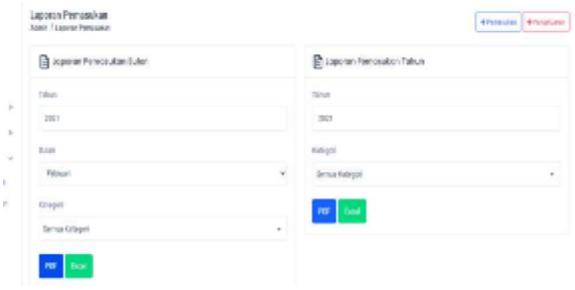


Figure 15. Print report based on the selected month and year

The report printing page is designed to help users generate financial reports for the selected period. The system supports the creation of monthly and annual reports by configuring parameters such as year, month, and report category. Furthermore, the system processes stored transaction data and generates outputs in both PDF and Microsoft Excel formats. This feature supports the systematic preparation of financial reports, simplifies the process of documenting and distributing data, and enhances effectiveness, transparency, and accountability in financial management.

2. Printing reports in PDF format.



PEMERINTAHAN KABUPATEN PESISIR SELATAN
DINAS PENDIDIKAN
SMA NEGERI 2 SUTERA
KAMPUNG PADANG TAE NAGARI AMPING PARAK, Kec. Sutera,
Kab. Pesisir Selatan, Sumatera Barat
Email : sman2sutera@gmail.com Telp. (0756) 000000

Persediaan Bulan Februari 2021

No	Nomor	Kategori	Tanggal	Nominal	Keterangan
1	0000001	Bantuan Operasional Sekolah (BOS)	22-02-2021	50.000.000	Bantuan BOS Tahun 2021

Dibuat Oleh,
Bendahara

Nurhasnah, S.Pd
NIP. _____

Mengetahui,
Kepala Sekolah

Marnaini, S.Pd, M.M
NIP. _____

Figure 16. Printing reports in PDF format.

The monthly revenue report page displays a summary of revenue transactions based on the period selected by the user. This report includes information such as the transaction number, revenue category, transaction date, revenue amount, and a description of each transaction. In addition, the report includes the institution's identification and an approval column intended for the treasurer and the school principal as a form of administrative validation. The generated report can be printed or saved as an archival document, thereby supporting more effective financial reporting, documentation, and auditing processes. This feature helps improve the quality of financial information presentation while strengthening transparency and accountability in school financial management.

3. Reports can be printed or exported in Microsoft Excel format



	A	B	C	D	E
1	Pemasukan Bulan Februari 2021				
2	No	Nomor	Kategori	Tanggal	Nominal
3	1	IN000000	Bantuan Operasional Sekolah (BOS)	27/02/2021	20.000.000,00

Figure 17. Reports can be printed or exported in Microsoft Excel format

Figure 17. Revenue Report in Microsoft Excel Format. This page displays the results of the revenue report exported to Microsoft Excel format, which is automatically generated by the system. The report presents transaction information in a structured format, including transaction number, revenue category, transaction date, amount, and description. Presenting the report in Microsoft Excel format makes it easier for users to process, document, and archive financial data, thereby supporting the preparation of reports that are more systematic, accurate, and easy to analyze.

4. Printing reports by month and year



Figure 18. Printing reports by month and year

The monthly income report printing page serves as a tool for generating financial reports based on criteria specified by the user. Data filtering is performed by selecting parameters such as year, month, and revenue category. Based on these parameters, the system automatically generates reports that can be downloaded in PDF or Microsoft Excel format. This feature simplifies the preparation, storage, and distribution of financial reports, while also supporting the presentation of information that is more accurate, efficient, transparent, and accountable.

The system test results table, which includes the functions tested, test scenarios, expected results, actual results, and success status, is presented in the table below.

Table 2. System Test Results

No	Function Tested	Testing Scenario	Expected Result	Actual Result	Status
1	Admin Login	Entering a valid username and password	The system verifies the account and displays the Admin dashboard	The Admin dashboard is successfully displayed	Passed
2	Treasurer Login	Entering a valid username and password	The system verifies the account and displays the Treasurer dashboard	The Treasurer dashboard is successfully displayed	Passed
3	Principal Login	Entering a valid username and password	The system verifies the account and displays the Principal dashboard	The Principal dashboard is successfully displayed	Passed
4	Login Validation	Entering an incorrect username or password	The system denies access and displays an error message	Access is denied and an error message is displayed	Passed
5	Add Income Data	Entering income data and saving the transaction	The income data are saved and displayed in the transaction list	The data are successfully saved and displayed	Passed
6	Edit Income Data	Selecting and modifying existing income data	The selected data are updated according to the changes	The data are successfully updated	Passed
7	Delete Income Data	Selecting an income transaction to delete	The system deletes the selected data after confirmation	The data are successfully deleted	Passed
8	Add Expense Data	Entering expense data and saving the transaction	The expense data are saved and displayed	The data are successfully saved and displayed	Passed

			in the transaction list		
9	Edit Expense Data	Modifying existing expense information	The expense data are updated according to the changes	The data are successfully updated	Passed
10	Delete Expense Data	Selecting an expense transaction to delete	The system deletes the selected transaction	The transaction is successfully deleted	Passed
11	Expense Type Management	modifying expense types	The system saves new expense types and updates existing ones	Expense types are successfully added and updated	Passed
12	Financial Recapitulation	Opening the income and expense recapitulation menu	The system displays total income, total expenses, and the remaining balance	The financial recapitulation is displayed according to the transaction data	Passed
13	Report Filtering	Selecting a reporting period by month and year	The system displays the report according to the selected period	The report is successfully displayed according to the selected period	Passed
14	Report Printing	Selecting the report printing option	The system generates a report that can be printed	The report is successfully generated and printed	Passed
15	Excel Report Export	Selecting the option to export the report to Excel	The system generates the report in Excel format	The Excel file is successfully generated	Passed
16	Principal Access Right	The Principal attempts to access transaction data	The Principal can view financial information but cannot modify the data	Financial data can be viewed and cannot be modified	Passed
17	Admin/Treasurer Access Rights	Admin or Treasurer accesses the transaction	The user can add, edit, delete, and view data according to	All functions operate according to the assigned access rights	Passed

		management menu	the assigned access rights		
18	Logout	Selecting the logout menu	The system terminates the user session and returns to the login page	The system terminates the user session and returns to the login page	Passed

DISCUSSION

The findings of this study indicate that the developed web-based accounting information system provides a more integrated approach to school financial management than the previously used combination of cash books and Microsoft Excel. The main contribution of the system is not merely the digitization of financial records, but the integration of transaction recording, supporting-document management, financial monitoring, role-based access, and periodic reporting within a single platform. This finding is consistent with the view that Accounting Information Systems (AIS) can function not only as a transaction-recording mechanism but also as an instrument for internal control, monitoring, and managerial decision-making. In the context of this study, the integration of these functions reduces dependence on manually prepared financial information and provides authorized users with more timely access to financial data.

The findings also support previous studies that have demonstrated the benefits of web-based systems for financial management. Earlier research has generally shown that web-based information systems can improve financial reporting efficiency, information accessibility, and transparency. However, the present study extends these findings by integrating several functions that were previously addressed separately. Rather than focusing only on a particular financial activity, the developed system combines revenue and expenditure recording, transaction documentation, financial summaries, cash-balance monitoring, and report generation. This integrated approach is particularly relevant to school financial management because financial accountability requires not only the availability of reports but also the existence of supporting evidence and mechanisms for monitoring the use of funds.

The results further demonstrate that direct access to financial information for the principal provides an important distinction from conventional financial reporting practices. In the previous process, financial information was recorded in cash books and subsequently

processed using Microsoft Excel, which could result in delays in preparing reports and limited access to current financial information. The developed system allows the principal to monitor financial information directly without waiting for manually prepared reports from the treasurer. This finding strengthens the argument in previous studies that timely and accessible financial information can improve organizational monitoring and support more effective decision-making. However, the present study adds an important control mechanism by separating monitoring authority from transaction-management authority: the principal can access and monitor financial information but cannot modify or delete financial transactions. This separation provides a clearer relationship between information access and responsibility than a system in which all users have equivalent authority.

In terms of transparency, the findings are in line with previous research emphasizing that web-based information systems facilitate the presentation of financial information in a more accessible and timely manner. Previous studies have highlighted the importance of digital reporting and documentation in supporting transparency because stakeholders can obtain updated information without depending entirely on manual reporting processes. The present system operationalizes this principle through direct financial monitoring, dashboard-based information, and periodic reports that can be generated in digital formats. Thus, the contribution of this study is not simply that financial information is available electronically, but that information availability is connected to the monitoring responsibilities of authorized users. This distinction is important because transparency is strengthened when relevant financial information can be accessed by the appropriate decision-maker at the time it is needed.

The findings concerning accountability are also consistent with previous research that associates systematic financial documentation and traceability with stronger accountability. In this study, transaction receipts and supporting documents are stored as part of the financial records and can be used for verification, reporting, archiving, and auditing. Consequently, accountability is supported not only by the production of financial reports but also by the availability of evidence underlying each transaction. This is an important extension of previous web-based financial systems that primarily emphasize report generation. The developed system links transaction data with

supporting documentation, making the financial information more traceable and easier to verify.

The findings are also consistent with the principle that transparency and accountability are complementary rather than separate objectives. Transparency concerns the accessibility of financial information, whereas accountability requires that the information presented can be verified and associated with responsible parties. The developed system addresses both dimensions through differentiated user access, structured transaction records, supporting documents, and digitally generated reports. Therefore, the contribution of the system lies in connecting information accessibility with verification and control mechanisms. This integrated relationship is particularly important in school financial management, where the availability of financial information alone does not necessarily guarantee accountability unless the underlying transactions can also be documented and verified.

Another important finding is the improvement in the efficiency of financial reporting. The system can generate reports based on selected periods and provide outputs in PDF and Microsoft Excel formats. Previous research has demonstrated that automated reporting can reduce delays in financial report preparation and improve the availability of current financial information. The present study supports this finding while extending it to a school-specific financial management context in which reporting, documentation, and monitoring are integrated. The ability to generate reports from stored transaction data means that the reporting process no longer depends entirely on manually compiling information from separate records.

Overall, the comparison with previous research suggests that the main novelty of this study lies in the integration of functions and authority structures, rather than in the use of web technology itself. Previous studies have established that digital financial systems can improve accessibility, reporting efficiency, and transparency, while this study combines those capabilities with role-based access, transaction evidence, direct principal monitoring, and periodic reporting in one school financial management system. Therefore, the developed system addresses a broader set of financial governance requirements than systems that focus only on transaction recording or report generation. This finding strengthens the research gap identified in the introduction and demonstrates

that the proposed system provides an integrated technological mechanism for supporting transparency, accountability, accuracy, and efficiency in school financial management.

5. CONCLUSIONS

Based on the results of system development, testing, and implementation, the developed web-based accounting information system successfully supports school financial management in a more structured, integrated, and efficient manner. The system enables administrators and treasurers to record, update, delete, and manage revenue and expenditure transactions according to their respective access rights. The principal can directly access financial information and reports without waiting for manually prepared documents from the treasurer. The claim that the system supports improved transparency is reflected in several implemented functions, including direct access to financial transaction information for authorized users, dashboard-based presentation of revenue, expenditure, and cash-balance information, as well as the availability of periodic financial reports that can be generated in PDF and Microsoft Excel formats. These features make financial information more accessible, timely, and easier to monitor by authorized decision-makers. The system also supports financial accountability through role-based access control, structured transaction recording, digital storage of transaction supporting documents, transaction receipts, and documented financial reports that can be used for verification, reporting, and auditing purposes. The separation between transaction-management authority and monitoring authority further strengthens accountability, as the principal can monitor financial information without having permission to modify or delete transaction data.

The results of functional testing showed that all tested functions operated according to the expected results. Therefore, the developed system can be concluded to support transparency and accountability through improved accessibility, traceability, documentation, and monitoring of school financial information. However, the study does not quantitatively measure the increase in transparency and accountability before and after system implementation. The findings should therefore be interpreted as evidence that the system provides functional mechanisms that support these principles rather than as evidence of a statistically measured improvement.

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