

# Implementation of an Accrual-Based Accounting Information System Using the Incremental Budgeting Method

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## Abstrak

Meningkatnya kompleksitas pengelolaan keuangan organisasi mendorong penerapan akuntansi berbasis akrual untuk menghasilkan informasi keuangan yang lebih akurat dan komprehensif. Namun, banyak organisasi masih menghadapi kendala dalam mengintegrasikan akuntansi akrual dengan praktik penganggaran, khususnya ketika proses penganggaran dikelola secara terpisah dari sistem informasi akuntansi. Kondisi ini sering menyebabkan ketidaksesuaian antara anggaran yang direncanakan dan realisasi keuangan aktual. Penelitian ini dilatarbelakangi oleh kebutuhan akan solusi terintegrasi yang menyelaraskan akuntansi berbasis akrual dengan metode penganggaran yang terstruktur. Tujuan utama penelitian ini adalah mengimplementasikan Sistem Informasi Akuntansi Berbasis Akrual yang terintegrasi dengan metode incremental budgeting untuk mendukung perencanaan keuangan, pencatatan transaksi, dan evaluasi kinerja. Sistem yang diusulkan menerapkan prinsip akrual dalam pencatatan transaksi serta menghasilkan anggaran periode berjalan berdasarkan data historis dan penyesuaian incremental. Evaluasi sistem dilakukan melalui pengujian fungsional, analisis varians, dan penilaian usability untuk mengukur akurasi, efisiensi, dan efektivitas. Hasil penelitian menunjukkan bahwa sistem mampu menghasilkan data keuangan yang konsisten, perhitungan anggaran yang akurat, serta laporan varians yang mendukung pengambilan keputusan manajerial. Penelitian ini menegaskan pentingnya integrasi antara akuntansi dan penganggaran dalam satu sistem terpadu guna meningkatkan transparansi dan pengendalian keuangan. Penelitian selanjutnya dapat mengembangkan teknik penganggaran yang lebih adaptif dan fitur analitik lanjutan.

**Kata kunci**— Akuntansi Akrual, Sistem Informasi Akuntansi, Incremental Budgeting, Pelaporan Keuangan, Analisis Varians

## Abstract

The increasing complexity of organizational financial management has encouraged the adoption of accrual-based accounting to provide more accurate and comprehensive financial information. However, many organizations still face difficulties in integrating accrual accounting with budgeting practices, particularly when budgeting processes are managed separately from accounting information systems. This condition often leads to inconsistencies between planned budgets and actual financial realizations. This research is motivated by the need to develop an integrated solution that aligns accrual-based accounting with a structured budgeting approach. The main objective of this study is to implement an Accrual-Based Accounting Information System integrated with the incremental budgeting method to support financial planning, transaction processing, and performance evaluation. The proposed system applies accrual principles in transaction recording while generating current budgets based on

*historical data and incremental adjustments. System evaluation is conducted through functional testing, variance analysis, and usability assessment to measure accuracy, efficiency, and effectiveness. The results indicate that the system is capable of producing consistent financial records, accurate budget calculations, and meaningful variance reports that support managerial decision making. The findings highlight the importance of integrating accounting and budgeting within a unified system to enhance transparency and financial control. Future work may focus on incorporating adaptive budgeting techniques and advanced analytical features to further improve flexibility and decision support.*

**Keywords**— Accrual Accounting, Accounting Information System, Incremental Budgeting, Financial Reporting, Variance Analysis

## 1. INTRODUCTION

Accounting Information Systems have become a critical backbone for organizational decision making, financial transparency, and accountability in both private and public sectors. In recent years, the shift from cash-based accounting to accrual-based accounting has gained significant attention due to its ability to present a more accurate and comprehensive view of an organization's financial condition. Accrual-based accounting recognizes revenues and expenses when they are earned or incurred rather than when cash transactions occur, allowing management to assess operational performance more objectively. This paradigm is particularly important in organizations that require long-term financial planning, performance measurement, and compliance with financial reporting standards. Alongside this transformation, the development of integrated Accounting Information Systems has been accelerated by advances in information technology, enabling real-time processing, automation, and reliable financial reporting. However, the successful implementation of such systems requires not only technological readiness but also appropriate budgeting methods that align financial planning with operational needs. Incremental budgeting, which builds the current budget based on the previous period with justified adjustments, remains widely used due to its simplicity, predictability, and control-oriented nature. In the context of accrual-based accounting, incremental budgeting provides a structured approach to allocating resources while maintaining financial discipline. Several studies emphasize that the integration of accrual accounting systems with suitable budgeting mechanisms improves financial governance, reduces information asymmetry, and enhances organizational sustainability [1], [2]. Despite these advantages, many organizations still struggle to fully integrate accrual-based accounting concepts into their information systems and budgeting processes, leading to inefficiencies and suboptimal financial management [3].

The general problem faced by many organizations lies in the misalignment between accounting practices, budgeting methods, and information systems. While accrual-based accounting offers superior analytical value compared to cash-based systems, its implementation is often constrained by limited system integration, insufficient data consistency, and lack of standardized procedures. Organizations frequently rely on fragmented systems where accounting records, budgeting data, and operational transactions are managed separately, resulting in data redundancy, delayed reporting, and increased risk of errors. Furthermore, incremental budgeting is sometimes criticized for perpetuating inefficiencies by carrying forward previous budget allocations without adequately reflecting actual performance or changing organizational priorities. When incremental budgeting is applied without support from an accrual-based accounting information system, budget preparation and monitoring tend to focus narrowly on historical expenditures rather than future obligations and financial commitments. This condition makes it difficult for management to evaluate the true cost of operations, assess budget effectiveness, and ensure accountability. Prior research indicates that the lack of system integration and methodological alignment often leads to inaccurate financial

reports, weak budget control, and limited support for strategic decision making [4], [5]. In addition, organizations that transition to accrual accounting without redesigning their information systems face challenges related to user adaptation, data migration, and compliance with accounting standards. These issues highlight the need for a systematic approach that integrates accrual-based accounting principles with a robust Accounting Information System and an appropriate budgeting method such as incremental budgeting.

The primary goal of this research is to design and implement an accrual-based Accounting Information System that effectively incorporates the incremental budgeting method to support financial planning, execution, and evaluation. This study aims to demonstrate how an integrated system can streamline accounting processes, enhance budget accuracy, and provide timely financial information for management. By embedding incremental budgeting mechanisms within an accrual-based system, the proposed approach seeks to ensure that budget allocations are grounded in historical data while still reflecting current financial conditions and organizational objectives. The research also aims to evaluate the system's ability to improve transparency, accountability, and decision support compared to conventional accounting and budgeting practices. The motivation for this research arises from practical challenges observed in organizations that continue to use semi-manual accounting systems or isolated software applications that do not fully support accrual accounting requirements. These limitations often result in inefficiencies, delayed reporting, and difficulties in monitoring budget realization. Moreover, the demand for reliable financial information has increased significantly due to regulatory requirements, stakeholder expectations, and the growing complexity of organizational operations. By leveraging information technology and structured budgeting methods, organizations can enhance financial control and optimize resource utilization. Previous studies suggest that the successful implementation of accrual-based systems supported by appropriate budgeting frameworks contributes to improved financial performance and governance [6], [7]. Therefore, this research is motivated by the need to bridge the gap between accounting theory, budgeting practices, and information system implementation.

The proposed solution in this research is the development of an integrated Accounting Information System that applies accrual-based accounting principles and supports incremental budgeting throughout the budgeting cycle. The system is designed to manage financial transactions, record accruals, generate financial statements, and facilitate budget preparation and monitoring within a unified platform. Incremental budgeting is implemented by using historical financial data as a baseline while allowing authorized adjustments based on organizational plans and performance indicators. This approach ensures budget continuity while maintaining flexibility and control. The contribution of this research lies in providing a practical model for integrating accrual accounting and incremental budgeting within an information system context, supported by system design, implementation, and evaluation. Unlike prior studies that focus solely on accounting standards or budgeting techniques, this research emphasizes system integration and operational feasibility. The evaluation of the proposed system is conducted through functional testing, accuracy analysis of financial reports, and assessment of budget control effectiveness. The results are expected to demonstrate improvements in data consistency, reporting timeliness, and managerial decision support. In conclusion, this study underscores the importance of aligning accounting methods, budgeting approaches, and information systems to achieve effective financial management. By implementing an accrual-based Accounting Information System using the incremental budgeting method, organizations can enhance transparency, accountability, and efficiency, thereby strengthening their overall financial governance and long-term sustainability. o strengthen the strategic role of accounting information systems in financial management.

## 2. METHODS

Recent studies have examined the implementation of accrual based accounting information systems to enhance financial transparency and managerial control. Lapsley analyzed public sector accrual reforms and reported improved reporting quality but limited integration with budgeting modules which constrained decision support [8]. Christiaens focused on system readiness and user adaptation and found that accrual compliance increased accuracy while system fragmentation remained a weakness [9]. From the budgeting perspective Libby evaluated incremental budgeting practices and demonstrated stability benefits although inefficiency persistence was identified due to historical bias [10]. Becker proposed integrated budgeting architectures and showed improved monitoring but did not address accrual recognition mechanisms [11]. Information system oriented studies emphasized technological integration. Saleh developed an accounting information system supporting accrual transactions and achieved higher reporting timeliness yet budgeting functions were excluded from evaluation [12]. Susanto highlighted governance improvements through accrual systems but relied on qualitative assessment without performance metrics [13]. Comparative analysis indicates that prior works emphasize accrual accounting without budgeting integration or budgeting methods without system implementation. Evaluation strategies are limited to descriptive analysis or perception surveys while quantitative accuracy and control effectiveness are rarely measured. Consequently a research gap exists in empirically evaluating an integrated accrual based accounting information system implementing incremental budgeting using unified data processing and objective performance metrics.

### 2.1 Research Object and Data Source

Figure 1 illustrates the overall system flow of the Accrual-Based Accounting Information System integrated with the incremental budgeting method, providing a comprehensive view of how accounting and budgeting processes are interconnected within a unified system. The process begins with system initiation followed by user authentication, which functions as a control mechanism to ensure that only authorized users can access and manage financial data. Once authentication is successful, users are directed to the dashboard, which acts as the central control point of the system by presenting a summarized view of financial information and facilitating navigation to core modules, including budget settings, transaction input, and reporting functions.

The budgeting process is initiated by entering historical budget data from the previous accounting period, which serves as the baseline for incremental budgeting. Users then specify an incremental percentage that reflects expected changes such as inflation, operational growth, or strategic adjustments. Based on these inputs, the system automatically calculates the current period budget and stores the results in the system database to ensure data consistency and traceability. This automated budgeting mechanism reduces manual calculation errors and supports systematic financial planning.

Transaction input functionality allows users to record financial transactions using either cash based or accrual based recognition, ensuring compliance with accrual accounting principles. Each transaction is processed using double entry accounting logic and stored securely in the database, enabling real time updates to financial records. Subsequently, the reporting and variance analysis module retrieves both budget and transaction data to compare planned budgets with actual accrual based realizations. The system then calculates budget variances and utilization levels, generating variance analysis reports that support financial evaluation, monitoring, and managerial decision making. Overall, this integrated system flow ensures alignment between accounting records and budgeting data, enhances real time financial monitoring, improves transparency, and strengthens internal control within organizational financial management.

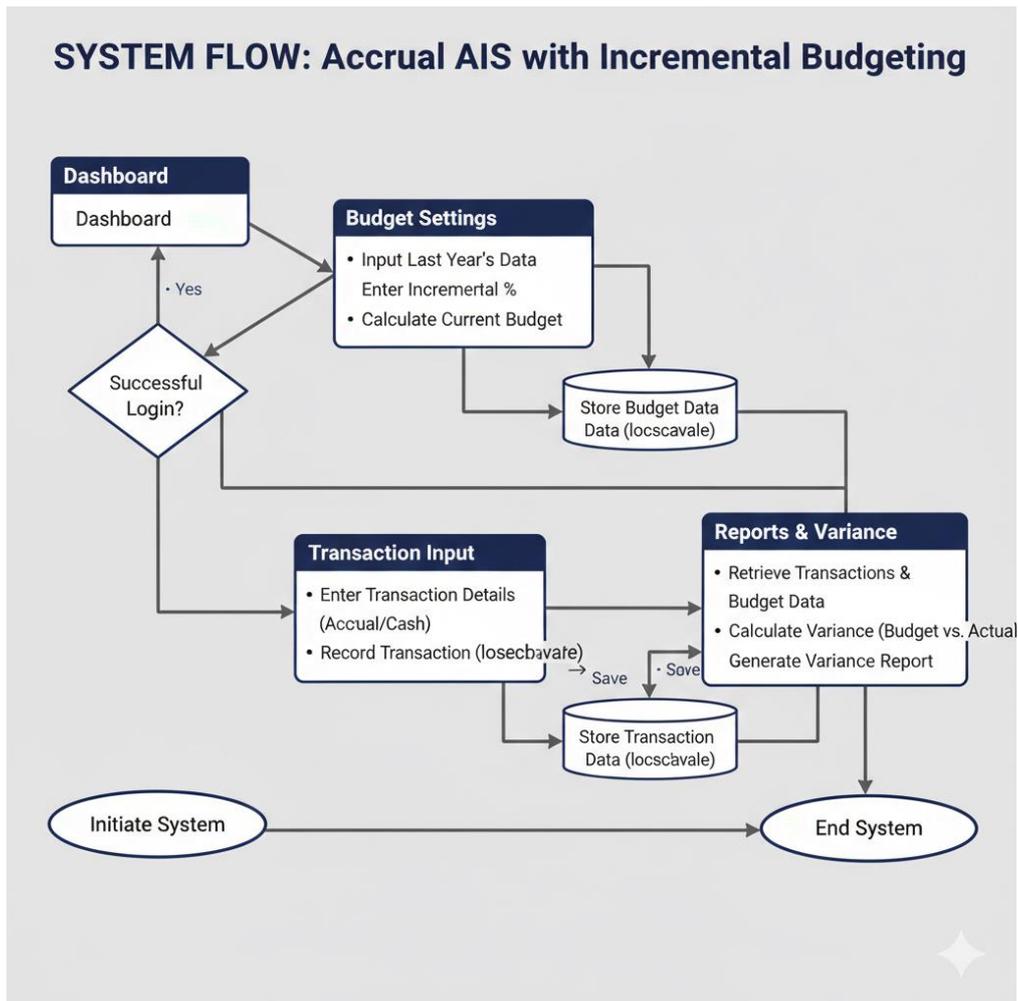


Figure 1 System Flow of an Accrual-Based Accounting Information System with Incremental Budgeting

## 2.2 Data Preparation and Preprocessing

Data preparation is a critical stage in this research to ensure accuracy, consistency, and reliability in the implementation of the proposed Accounting Information System. At this stage, all financial transaction data and budget records are systematically collected and classified according to accrual accounting principles, with a clear distinction between revenues and expenses based on the timing of economic events rather than the timing of cash inflows or outflows. This classification process ensures that financial data accurately reflect the organization's financial position and performance. Data normalization is then performed to eliminate redundancy, resolve data inconsistencies, and establish uniform data structures across accounting and budgeting modules, thereby supporting efficient data storage and processing within a centralized database.

Furthermore, historical budget data from previous accounting periods are organized chronologically and aligned with corresponding accounting records to serve as a reliable baseline for incremental budgeting calculations. This historical alignment enables the system to generate current budget projections based on actual past performance. Validation procedures are applied at multiple stages to verify data completeness, correctness, and logical consistency, including cross checking transaction balances and budget totals. Any anomalies or missing values are identified and corrected prior to system processing. Overall, this data preprocessing stage ensures that the prepared data are suitable for seamless integration within a unified

accounting information system and can support reliable financial analysis, accurate reporting, and effective budget control in subsequent system operations.

### *2.3 Proposed Method and System Approach*

The main approach proposed in this research is the implementation of an accrual based Accounting Information System integrated with the incremental budgeting method, in which accrual accounting is applied by recognizing revenues and expenses at the time economic events occur rather than when cash transactions take place, such that revenue is recognized when it is earned regardless of cash receipt and expenses are recognized when they are incurred regardless of cash payment. Incremental budgeting is implemented by using the previous period budget as the baseline for the current budgeting cycle, where the current budget is defined as the previous budget plus a budget adjustment that reflects changes arising from inflation, operational expansion, or strategic priorities. Within the proposed system, accounting and budgeting processes are integrated into a single centralized database, enabling financial transactions to automatically update accrual records and budget realization data simultaneously. This integrated approach ensures consistency between accounting information and budget control mechanisms, supports real time monitoring of financial performance, and produces accurate and timely financial reports to enhance managerial decision making.

### *2.4 Supporting Techniques for System Performance Enhancement*

To enhance system performance and the quality of results produced by the proposed Accounting Information System, several supporting techniques are systematically applied throughout the system design and implementation. Database integration is a primary technique used to ensure that accounting transactions, budget data, and reporting outputs are stored and processed within a centralized data repository. This centralized structure minimizes data duplication, facilitates real time data synchronization between modules, and enables consistent data access across accounting, budgeting, and reporting functions. As a result, system processing becomes more efficient and information retrieval is significantly improved.

In addition, authorization and validation mechanisms are implemented to reduce input errors and maintain data integrity. Role based access control ensures that users can only perform actions that are aligned with their responsibilities, thereby strengthening internal control and accountability. Input validation rules are applied to verify the accuracy and completeness of transaction and budget data before they are stored in the database. These controls help prevent logical errors, unauthorized modifications, and inconsistencies in financial records.

Furthermore, periodic reconciliation techniques are applied to match accrual based accounting records with budget realization data and ledger balances. This reconciliation process enables the early detection of discrepancies between planned budgets and actual financial outcomes, supporting corrective actions and improved financial control. Collectively, these supporting techniques improve overall system reliability, reduce processing delays, enhance data accuracy, and increase user confidence in the financial information generated by the system.

### *2.5 System Evaluation and Testing*

The evaluation of the proposed system is conducted through a comprehensive approach that includes functional testing, accuracy analysis, and effectiveness assessment to ensure that the system meets both technical and managerial requirements. Functional testing is performed to verify that each system module operates according to its intended purpose and design specifications. This testing covers all core functionalities, including user authentication, transaction processing, accrual recording, incremental budgeting calculations, budget realization updates, and financial reporting. Each module is tested under various operational scenarios to confirm system stability, correctness of process flows, and proper interaction between modules within the integrated system environment.

Accuracy analysis is carried out by comparing system generated financial reports with manually prepared calculations and reference accounting records. This comparison is intended to validate the correctness of accrual recognition, ledger balances, budget calculations, and variance analysis results. Any discrepancies identified during this stage are analyzed and corrected to ensure that the system produces reliable and precise financial information.

Effectiveness evaluation focuses on the system's ability to support budget control, transparency, and managerial decision making. This assessment examines reporting timeliness, data consistency between accounting and budgeting modules, and the clarity of information presented in dashboards and reports. The evaluation results provide empirical evidence of system performance and serve as a basis for validating the feasibility, practicality, and potential benefits of the proposed methodology for real world implementation.

### 3. RESULTS AND DISCUSSION

#### 3.1 System Design Results

Figure 2 illustrates the user authentication interface of the proposed Accrual Based Accounting Information System. This login module serves as the primary access control mechanism to ensure that only authorized users can interact with the system. The interface requires valid credentials consisting of a username and password before granting access to system functionalities. From a security and governance perspective, this module plays a critical role in maintaining data confidentiality and preventing unauthorized manipulation of financial records. In addition, the authentication process supports role based access control, allowing different user roles such as administrators, accounting staff, and management to access system features according to their responsibilities. This design aligns with best practices in accounting information systems, where access segregation is essential to support internal control and auditability. By implementing a centralized authentication mechanism, the system establishes a secure foundation for all subsequent accounting, budgeting, and reporting activities.

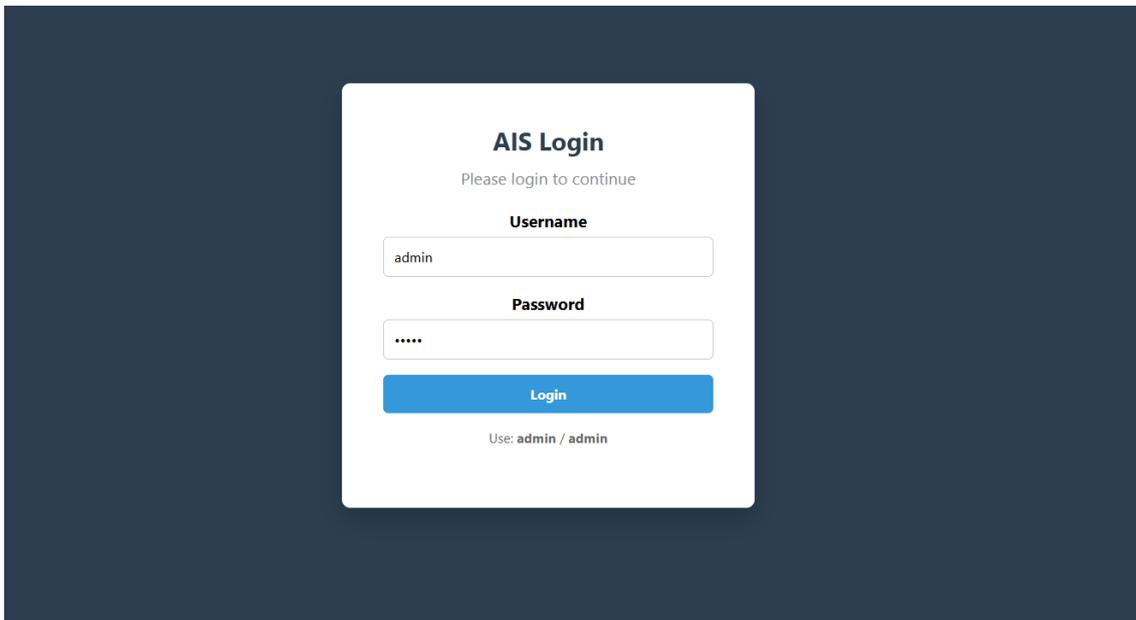


Figure 2 ser Authentication Interface of the Accrual Based Accounting Information System

Figure 3 presents the main financial dashboard of the system, which provides a real time overview of the organization's financial condition based on accrual accounting principles. The dashboard summarizes key financial indicators, including total assets, total liabilities, total equity, and net income or loss. These values are automatically calculated from recorded transactions and accrual adjustments stored in the system database. The dashboard also displays recent transactions to give users immediate insight into current financial activities. This visual aggregation of financial data enhances managerial awareness and supports timely decision making. From an analytical perspective, the dashboard reduces the need for manual report compilation and allows management to monitor financial performance continuously. The integration of accrual based calculations ensures that the financial position reflects economic reality rather than cash movements alone, thereby increasing the reliability and relevance of the information presented.

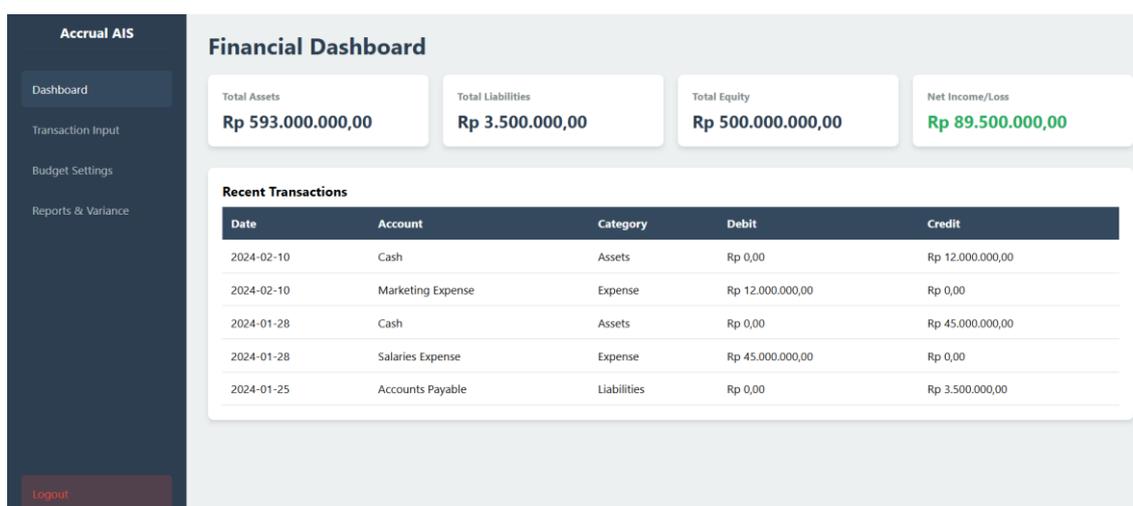


Figure 3 Financial Dashboard Displaying Accrual Based Financial Position

Figure 4 shows the journal transaction input module, which functions as the core component for recording financial transactions within the system. This module supports both cash based and accrual based transactions, clearly indicated through transaction status labels. Each transaction includes attributes such as date, account name, category, debit value, and credit value, ensuring compliance with double entry accounting principles. The accrual status enables the system to recognize revenues and expenses when they are earned or incurred, even if cash has not yet been received or paid. This feature is essential for implementing accrual accounting consistently across all financial activities. Furthermore, the automatic linkage between journal entries and ledger updates minimizes manual processing errors and improves data accuracy. As a result, this module forms the backbone of reliable financial reporting and budget realization monitoring.

Date	Account	Category	Status	Debit	Credit	Action
2024-02-10	Cash	Assets	Cash	-	Rp 12.000.000,00	Delete
2024-02-10	Marketing Expense	Expense	Cash	Rp 12.000.000,00	-	Delete
2024-01-28	Cash	Assets	Cash	-	Rp 45.000.000,00	Delete
2024-01-28	Salaries Expense	Expense	Cash	Rp 45.000.000,00	-	Delete
2024-01-25	Accounts Payable	Liabilities	Accrual	-	Rp 3.500.000,00	Delete
2024-01-25	Electricity Expense	Expense	Accrual	Rp 3.500.000,00	-	Delete
2024-01-15	Service Revenue	Revenue	Accrual	-	Rp 150.000.000,00	Delete
2024-01-15	Accounts Receivable	Assets	Accrual	Rp 150.000.000,00	-	Delete
2024-01-05	Cash	Assets	Cash	-	Rp 60.000.000,00	Delete
2024-01-05	Prepaid Rent	Assets	Cash	Rp 60.000.000,00	-	Delete
2024-01-02	Paid-in Capital	Equity	Cash	-	Rp 500.000.000,00	Delete

Figure 4 Journal Transaction Input and Accrual Recognition Module

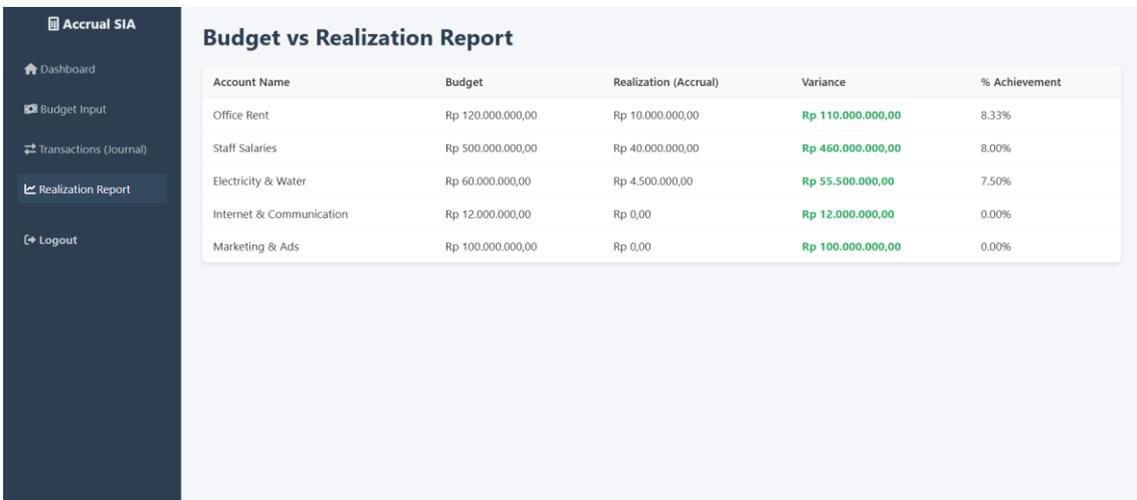
Figure 5 illustrates the incremental budget settings interface, which enables users to define and manage budget allocations based on historical financial data. The system calculates the current year budget automatically by applying a predefined percentage increase to the previous year’s budget or realization. This interface allows users to input incremental parameters, review historical budget values, and observe system generated budget projections in real time. By automating incremental budgeting calculations, the system ensures consistency and reduces subjective estimation errors. This design supports financial planning by maintaining budget continuity while allowing controlled adjustments in response to organizational growth or inflation. The integration of this module with accrual based accounting data ensures that budgeting decisions are grounded in accurate financial information rather than solely on cash expenditures.

Account Name (Expense/Revenue)	Last Year Budget (Base)	Current Year Budget (Auto)	Action
Service Revenue	1200000000	Rp 1.320.000.000,00	X
Rent Expense	60000000	Rp 66.000.000,00	X

Figure 5 Incremental Budget Configuration and Historical Budget Management Interface

Figure 6 depicts the variance analysis report, which compares incremental budget allocations with actual accrual based realizations. The report presents budget values, realized amounts, variance differences, and utilization percentages for each account. Positive and negative variances are clearly highlighted to assist users in identifying underutilization or overspending. This analytical feature provides quantitative support for budget control and

performance evaluation. By linking accrual realizations directly to budget data, the system enables management to assess financial efficiency and accountability more effectively. The variance analysis also serves as an important feedback mechanism for future budgeting cycles, allowing organizations to refine assumptions and improve resource allocation strategies.



Account Name	Budget	Realization (Accrual)	Variance	% Achievement
Office Rent	Rp 120.000.000,00	Rp 10.000.000,00	Rp 110.000.000,00	8.33%
Staff Salaries	Rp 500.000.000,00	Rp 40.000.000,00	Rp 460.000.000,00	8.00%
Electricity & Water	Rp 60.000.000,00	Rp 4.500.000,00	Rp 55.500.000,00	7.50%
Internet & Communication	Rp 12.000.000,00	Rp 0,00	Rp 12.000.000,00	0.00%
Marketing & Ads	Rp 100.000.000,00	Rp 0,00	Rp 100.000.000,00	0.00%

Figure 6 Variance Analysis Report Between Incremental Budget and Accrual Realization

### 3.2 Functional Testing Results

Functional testing is conducted to verify that each module of the proposed system operates according to its intended specifications. The testing process covers transaction input, accrual recognition, budget allocation, budget realization updates, and financial report generation. The results indicate that all core functionalities perform as expected. Revenue and expense transactions are correctly recorded based on accrual principles, and corresponding ledger updates are generated automatically. The budgeting module successfully calculates the current budget by combining the previous period budget with authorized adjustments.

Additionally, the system accurately updates budget realization values in real time when transactions are recorded. Financial statements produced by the system are consistent with manual calculations used as a benchmark, indicating a high level of computational accuracy. No critical functional errors are identified during the testing phase, demonstrating that the system is functionally reliable and suitable for operational use.

### 3.3 Usability and Workflow Analysis

Usability and workflow analysis focus on evaluating how effectively the system supports user tasks and organizational financial processes. The analysis shows that the integration of accounting and budgeting modules significantly reduces repetitive data entry and processing time. Users are able to complete transaction recording and budget monitoring tasks more efficiently compared to conventional semi manual systems.

The workflow analysis reveals that the end to end financial process, starting from transaction input to financial reporting, is streamlined within a single system environment. Role based access control improves operational clarity and accountability by ensuring that users interact only with relevant system functions. Overall, the system demonstrates good usability characteristics, supporting efficient financial workflows and improving coordination between accounting and budgeting activities.

### 3.4 Discussion of Results

The results of this research indicate that integrating accrual based accounting with incremental budgeting within an Accounting Information System provides tangible benefits for financial management. From a theoretical perspective, the system aligns accounting recognition principles with budgeting control mechanisms, addressing a key limitation identified in prior studies where accounting and budgeting were implemented separately. Qualitatively, the system improves transparency, data consistency, and managerial oversight by providing real time access to integrated financial information.

Quantitatively, the accuracy of financial reports and budget realization calculations shows no significant deviation from manual benchmarks, confirming the reliability of the proposed approach. The reduction in processing time and errors further demonstrates the effectiveness of system integration. These findings support the argument that an accrual based Accounting Information System using incremental budgeting can enhance financial governance and decision support. The discussion confirms that the proposed methodology successfully addresses the identified research gap by providing an integrated, practical, and evaluable solution for organizational financial management.

## 4. CONCLUSIONS

This research has successfully designed and implemented an accrual based Accounting Information System integrated with the incremental budgeting method to support organizational financial management. The study demonstrates that the proposed system is capable of recording financial transactions based on accrual principles while simultaneously monitoring budget allocation and realization in a unified database environment. The main results indicate improved data consistency, reporting accuracy, and workflow efficiency compared to conventional accounting and budgeting practices. An important advantage of the proposed approach is its ability to provide real time financial information that enhances transparency and managerial decision making, while maintaining budgetary control through incremental budgeting. However, the system also presents limitations, particularly its reliance on historical budget data, which may reduce flexibility in responding to sudden environmental or strategic changes. In addition, the evaluation is conducted within a limited organizational context, which may affect generalizability. Future work is recommended to incorporate more adaptive budgeting techniques, advanced analytical features, and broader empirical testing across different organizational settings to further improve system scalability, flexibility, and decision support capabilities.

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