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Design and Construction of an Accounting Information System at the Nutrition Care Center of Jember State Polytechnic

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Abstract

This research addresses the urgency of effective, efficient, and accountable financial management in the nutrition service unit of an academic institution. At the Nutrition Care Center (NCC) of Politeknik Negeri Jember, financial records were previously managed manually using unstructured formats, resulting in frequent recording errors, limited transaction traceability, and delays in financial reporting. This study aims to design, develop, and evaluate an Accounting Information System (AIS) using Microsoft Excel tailored to the operational characteristics of NCC. The research applies a Research and Development (R&D) approach with stages including needs analysis, system design, implementation, verification, and evaluation. Data were collected through observation, interviews with NCC managers, and documentation. The results show that the developed AIS, consisting of integrated modules for transaction recording, classification, recapitulation, and financial reporting, has been successfully implemented and tested at NCC. The system significantly improves data accuracy, reduces human error in transaction recording, and accelerates the preparation of financial reports. In addition, the system strengthens internal control through standardized coding and structured data input, while also enhancing transparency and accountability in financial management. Furthermore, the system supports managerial decision-making by providing timely and reliable financial information. These findings indicate that the developed AIS is not only technically feasible but also effective in improving financial governance in academic-based business units.

Keywords: *Accounting Information Systems, Excel Based AIS, Internal Control, Financial Governance, Nutrition Care Centre*

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1. Introduction

Politeknik Negeri Jember (Polije) is a higher education institution that provides vocational education with a teaching and learning process based on the enhancement of knowledge, skills, and competency standards. One of the efforts to realize this learning process is through the development of *Teaching Factory* (TeFa) in various business fields. TeFa is important role in competency-based learning activities by simulating small to medium industries within the educational environment. In addition, TeFa also serves as one of the income-generating units at Politeknik Negeri Jember. One of the existing TeFa units is the Nutrition Care Center (NCC), which operates in the field of nutrition services, including assessment, consultation, nutrition counseling, and healthy food production. NCC as a pioneer TeFa that provides care services for public.

Financial management is the foundation for the sustainability of any business unit, including academic service-based units such as NCC at Politeknik Negeri Jember. As a nutrition service unit that supports vocational education, NCC not only plays a role in student practice activities but also functions as a business entity requiring accurate, efficient, and accountable financial recording and reporting systems. Currently, financial transaction recording at NCC is still performed manually using conventional bookkeeping. This condition creates several issues, such as vulnerability to recording errors, difficulties in tracking transaction history, and delays in financial reporting (Fauziyah, 2020). In the context of good governance, financial transparency and accountability are essential to ensure proper institutional management and decision making (Mardiasmo, 2021).

From the perspective of information technology, computerized accounting information systems (AIS) have been proven to efficiency, accuracy, and speed in financial data processing (Granlund, 2011). However, for small to medium industries such as NCC, Using commercial accounting software is often constrained by license costs, complexity, and limited human resources (Darwis et al., 2024). Therefore, an Excel-based accounting information system offers a strategic and rational solution, since Excel is familiar, flexible, and capable of handling computations for small to medium-scale systems (Andriyani, Pinandita, et al., 2024).

Based on these conditions, this research aims to design and develop a practical and user-friendly AIS that aligns with the operational characteristics of NCC as an academic business unit within a vocational education environment. The problem formulation of this study is: *How can an Accounting Information System (AIS) be designed and developed for the Nutrition Care Center of Politeknik Negeri Jember?* The objectives of this study are to :

1. Analyze and investigation to confirm the necessity of developing an AIS at NCC.

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2. Analyze the AIS design by identifying NCC's needs, existing data sources, and information as the basis for system design.
3. Develop an Excel-based AIS design tailored to NCC's requirements.
4. Implement the AIS at NCC.
5. Maintain the system through monitoring challenges and system improvements during implementation according to NCC's needs.

This research employs a Research and Development (R&D) approach using the waterfall system development model, which consists of four main stages: needs analysis, system design, system implementation, and testing & evaluation.

Unlike previous studies that generally focus on generic Excel-based accounting systems for SMEs, this research introduces a context-specific AIS designed for an academic nutrition service unit with unique operational characteristics. The novelty of this study lies in: (1) the integration of financial recording with multi-laboratory service structures under a single governance system; (2) the incorporation of automatic institutional revenue-sharing mechanisms (30%–70%) within the reporting system; (3) the use of structured transaction coding to strengthen internal control and reduce human error; and (4) the system's ability to support decision-making through dynamic financial recapitulation using pivot-based analysis. This positioning highlights that the contribution of this study is not merely technical development, but also the enhancement of financial governance and managerial control in academic business units.

2. Literature review

The implementation of accounting information systems (AIS) for small and medium enterprises as well as non-profit organizations. Research conducted by Andriyani (2024) demonstrated that an Excel-based AIS can improve efficiency in community health centers (*Puskesmas*) (Andriyani, Chairina, et al., 2024). In the public sector, AIS has proven to provide effectiveness and efficiency in the preparation of financial reports, while also enabling control over each financial data entry, thereby serving as a reference in organizational decision-making. This not only optimizes financial performance but also fulfills organizational needs for fundraising and financial transparency (Ismail, 2009). Meanwhile, in the education sector, the design and implementation of an Excel-based accounting system have been shown to enhance efficiency, accuracy, and transparency in financial management (Yosikawati et al., 2024).

However, to date, very few studies have specifically developed Excel-based AIS for academic service units such as the Nutrition Care Center (NCC) within vocational higher education institutions. This gap highlights the novelty of the present research. The system

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is uniquely developed to match the operational characteristics of NCC, focusing on the Excel platform as a cost-effective yet powerful solution that addresses the needs for transparency and accountability in the governance of vocational education business units.

3. Method

The research was conducted at the Teaching Factory (TeFa) Nutrition Care Center (NCC) of Politeknik Negeri Jember over a period of eight months, starting in May 2025 and continuing until December 2025 for reporting purposes. The research method employed is Research and Development (R&D) with a system development model approach that includes needs analysis, system design, implementation, verification, and maintenance. Data were collected through observation, interviews with NCC managers, and documentation. The research flow is illustrated in the following diagram:

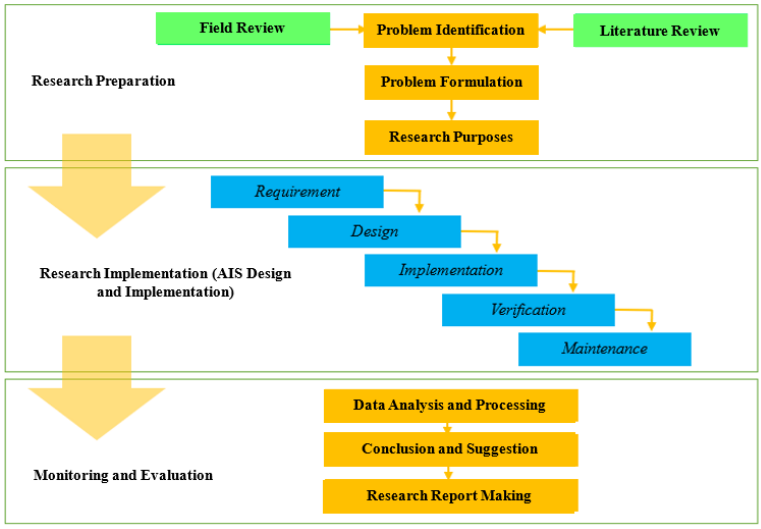


***Figure 1**. Roadmap Research*

The research procedure is described in detail as follows:

1. **Research Preparation**

   The preparation includes drafting the research proposal. The researcher conducts field studies, literature reviews as the basis for problem identification and Interview. Based on this identification, the research problem is formulated, followed by defining the research objectives, namely designing and developing an Accounting Information System (AIS) for the Nutrition Care Center (NCC) of Politeknik Negeri Jember. The data obtained is detailed data on NCC's income and expenditure transactions. Interviews were conducted with the Head of the NCC Laboratory and the Treasurer.

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2. **Research Implementation**
   - **a)** The implementation stage is carried out through the following phases: **Requirement** – conducting an investigation to identify the need for designing and developing an Accounting Information System (AIS) at the Teaching Factory Nutrition Care Center (NCC).
   - **b)** **Design** – analyzing the AIS design by identifying NCC's requirements and developing an Excel-based AIS design tailored to NCC's needs.
   - **c)** **Implementation** – implementing the AIS design within NCC's operations.
   - **d)** **Verification** – conducting socialization and verification at NCC to ensure that the AIS implementation has met its operational needs.
   - **e)** **Maintenance** – maintaining the system by monitoring potential issues and carrying out necessary improvements during the implementation phase in accordance with NCC's requirements.

3. **Monitoring and Evaluation**
   Monitoring and evaluation are carried out after all research activities have been completed. The researcher analyzes the collected data, prepares the final report, and formulates conclusions and recommendations for further improvement of the AIS.

4. Findings and discussion

The results of this study are presented based on a series of implementation stages designed to ensure that the development of the Accounting Information System (AIS) for the Teaching Factory Nutrition Care Center (NCC) at Politeknik Negeri Jember is systematic, user-oriented, and aligned with organizational needs. Each stage was carried out sequentially, from requirement analysis to system maintenance, providing a comprehensive overview of the AIS development process.

Requirement analysis and managerial issues

The initial stage focused on identifying system requirements through observation, interviews, and documentation of existing financial practices at NCC. The findings revealed several managerial issues rather than merely technical limitations. Financial transaction recording was still limited to simple cash flow tracking (income and expenditure) using unstructured formats. This condition increased the risk of human error, such as misclassification of transactions, duplication of records, and inconsistencies in financial data.

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In addition, the absence of a standardized coding system made it difficult to trace transactions and perform systematic financial analysis. The centralized management of financial reports across three laboratories further complicated monitoring and control processes. Another critical aspect was the institutional policy requiring a 30% revenue allocation to Politeknik Negeri Jember, which had not been systematically integrated into financial reporting. These conditions indicate weak internal control mechanisms and limited support for managerial decision-making.

System design as a managerial solution

Based on these findings, the AIS was designed not only as a recording tool but as a mechanism to improve financial governance. The system integrates several key components that support structured data input, classification, and reporting. Instead of relying on manual processes, the system introduces standardized transaction categories and coding structures that ensure consistency in financial records. The presence of a centralized dashboard and integrated reporting system enables managers to obtain a comprehensive overview of financial conditions in a timely manner. This reduces information asymmetry and supports faster, evidence-based decision-making. Moreover, the structured system design minimizes the risk of recording errors by guiding users through a more controlled and standardized input process.

The dashboard interface illustrates how financial information is presented in an integrated and accessible format, allowing users to monitor financial performance and navigate across system components efficiently. This feature supports managerial control and enhances the effectiveness of financial oversight (see Figure 2).



Figure 2. Dashboard Interface Supporting Financial Monitoring & Managerial Decision Making

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Improvement of internal control and reduction of human error

One of the most significant contributions of the developed AIS lies in its ability to strengthen internal control. Previously, manual recording practices created vulnerabilities such as undocumented transactions, calculation errors, and delays in report preparation. With the implementation of the AIS, transaction recording becomes more structured, traceable, and verifiable.

The use of transaction codes and standardized formats enhances accountability by ensuring that each transaction can be clearly identified and audited. This also reduces the likelihood of human error, particularly in data entry and report compilation. As a result, the system improves the reliability and consistency of financial information, which is essential for organizational transparency.

The structured transaction recording interface demonstrates how standardized input fields guide users in recording transactions systematically, thereby reducing errors and improving data traceability. This mechanism plays a crucial role in strengthening internal control and ensuring the accuracy of financial reporting (see Figure 3).

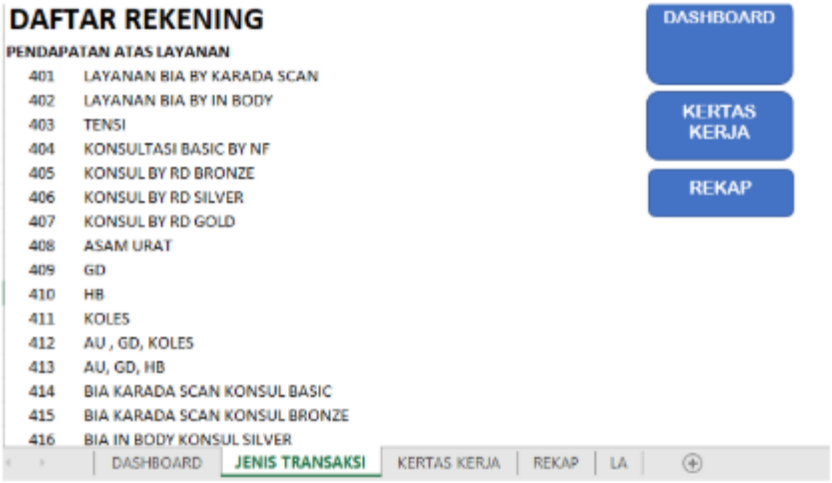


Figure 3. Structured Transaction Recording Interface for Enhancing Internal Control and Reducing Human Error

Support for decision making and financial transparency

The AIS also plays a strategic role in supporting managerial decision-making. Through systematic data recapitulation, financial information can be analyzed based on time periods, laboratory units, and transaction categories. This allows NCC management to

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evaluate financial performance, identify trends, and allocate resources more effectively. Furthermore, the integration of the 30%–70% revenue allocation policy into the system enhances transparency and ensures compliance with institutional regulations. Financial reports are generated in a standardized format and include an authorization mechanism, strengthening accountability in financial management. This condition reflects the application of good governance principles, particularly transparency, accountability, and efficiency.

Implications for academic business unit governance

Overall, the implementation of the AIS demonstrates that even a relatively simple system can produce significant managerial impacts when designed according to organizational needs. The system not only improves operational efficiency but also transforms financial management practices from being administrative oriented into decision oriented processes.

Thus, the AIS developed in this study contributes to improving governance quality in academic business units, particularly in strengthening internal control systems, reducing human error, and supporting data-driven decision-making. This finding confirms that the value of the system lies not in its technical complexity, but in its ability to address real organizational challenges and enhance managerial effectiveness.

5. Conclusion

The development of the Accounting Information System (AIS) at the Nutrition Service Center Teaching Factory (PPGI) of Jember State Polytechnic has been successful with the following conclusions:

- The Excel-based AIS successfully solved issues found in the manual financial recording process through a systematic implementation (requirement analysis → design → testing → refinement).
- The system integrates five main components — Dashboard, Transaction Type, Working Sheet, Recapitulation, and Financial Report — which work together to ensure accurate, efficient, and transparent financial reporting.
- The use of automated formulas and coding structures improves:
  - Data accuracy and consistency
  - Reduction of human errors
  - Timeliness of financial reporting
- The inclusion of automatic fund allocation (30% institutional, 70% laboratory) and authorized report validation strengthens:
  - Accountability

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- Financial transparency
- Administrative compliance

Overall, the implementation of the AIS at TEFA NCC demonstrates that a well-designed and properly integrated information system can significantly improve financial data accuracy, operational efficiency, and institutional accountability. Future development may focus on migrating the system into a web-based or database-driven platform to further enhance accessibility, scalability, and data security.

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