RESEARCH ARTICLE

Information System for Management of Savings and Loan Group Data at PNPM Peukan Baro Subdistrict, Pidie Regency

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Abstract

The National Program for Community Empowerment (PNPM-MPd) has played a significant role in improving the welfare of rural communities, especially through its savings and loan groups aimed at empowering women. However, PNPM Peukan Baro Subdistrict still relies on outdated, manual methods using Microsoft Word and Excel for managing data, leading to inefficiency and delays. This study developed an information system using Microsoft Visual BASIC 6.0 and Microsoft Access to automate and improve data management. The system streamlines tasks such as member registration, loan tracking, savings entries, and payment management, ensuring faster data processing, fewer errors, and more accurate reports. The development process included feasibility analysis, user requirement gathering, system design, and implementation. The new system's design focuses on simplicity and user-friendliness, making it accessible to both administrators and group members with limited technical knowledge. After thorough testing and training, the system is expected to improve transparency, accelerate operations, and enhance decision-making within PNPM Peukan Baro. Ultimately, this shift from manual processes to a computerized system aims to support the overall success and efficiency of community empowerment efforts in the region.

Keywords
Information System; Microsoft Visual BASIC; Microsoft Access; Automation; Data Management.

1 | INTRODUCTION

The National Program for Community Empowerment (PNPM-MPd) is a government initiative aimed at improving the welfare of communities, particularly in rural areas. One of the key aspects of PNPM-MPd is the management of revolving funds, which is facilitated through savings and loan groups that aim to improve financial access for marginalized groups, especially women. These savings and loan groups have become a pivotal component of empowering women economically. However, the management and monitoring of savings and loan data in some areas are still carried out using manual methods or limited systems, which can hinder the effectiveness of these programs. In many regions, especially in rural areas, the management of savings and loan data is still done using basic tools such as Microsoft Word and Excel. This process is time-consuming, prone to errors, and inefficient in generating the necessary reports for quick and accurate decision-making. Therefore, to maximize the effectiveness of the PNPM-MPd program, an information system is required that can manage savings and loan data more efficiently and accurately. In this case, leveraging computer-based information technology can be an effective solution to replace the manual methods currently in use.

Research by Romansyah *et al.* (2019) on the development of a web-based savings and loan payment information system for women at UPK Mantup Mandiri in Mantup Subdistrict, Lamongan Regency, shows that web-based systems can simplify the payment process, accelerate data processing, and improve the accuracy of financial reports. The results of this study indicate that with the implementation of a web-based information system, data management becomes more transparent and easier to monitor, thus supporting better decision-making in community empowerment programs. Similarly, Chrystanti-uni (2010) in her research on the data processing system for women's savings and loan groups at UPK Mitra Usaha Mandiri PNPM-MPd in Pringkuku Subdistrict, Pacitan Regency, emphasized that the application of an information system can speed up data entry and simplify financial reporting, while improving transparency in fund management. Additionally, Parit and Hulu (2016) in their research on the development of an information system for lending units at PNPM Mandiri in Keritang Subdistrict, Indragiri Hilir Regency, demonstrated the importance of computer-based information systems in enhancing operational efficiency and reducing human errors. Their study found that by developing a computer-based system, the processes of data entry, loan monitoring, and report generation could be performed more quickly and accurately. This is particularly important for PNPM-MPd, where efficient fund management will positively impact the smooth running of community empowerment programs.

The application of technology in savings and loan systems is also discussed in research by Febrian *et al.* (2023), who developed a decision support system for loan applications using the SMART method for PNPM Mandiri in Simelue Timur Subdistrict. In their study, Febrian *et al.* stated that computer-based decision support systems could facilitate the loan application process by providing recommendations based on predetermined criteria. This method is expected to enhance the accuracy of lending decisions and minimize the risks associated with loan evaluations. The study conducted by Larasati and Sambharakreshna (2016) on the management of revolving funds in women's savings and loan groups highlights the importance of a well-designed system to minimize the occurrence of non-performing loans. Their study, which focused on UPK in Binangun Subdistrict, Blitar Regency, recommended the use of an integrated information system to improve the efficiency of fund management and accelerate reporting processes. With a good information system, the management of savings and loans can be more transparent, which helps reduce the incidence of non-performing loans. Furthermore, Lubis (2015) in his research on the factors affecting the implementation of PNPM-MPd in Tanjung Betung Nagari, Pasaman Regency, emphasized that efficient and effective management of the savings and loan program depends on the implementation of a suitable system. In his study, Lubis found that poor and unorganized data management could hinder the achievement of PNPM-MPd objectives. Therefore, it is crucial to develop a system that can integrate the entire savings and loan management process, from data collection to report generation.

Based on the above discussions, this study aims to design and implement an information system for managing savings and loan data at PNPM Peukan Baro Subdistrict, Pidie Regency. The system will be developed using Microsoft Visual BASIC, a programming language known for its ability to manage large amounts of data efficiently and quickly. The system is expected to replace the current manual methods used and facilitate the management of data related to members, loans, savings, and payments. Moreover, the system will enable faster and more accurate report generation, which can be accessed by the management of PNPM Peukan Baro for informed decision-making. By developing this system, it is hoped that the operational efficiency of PNPM Peukan Baro can be improved, data processing can be accelerated, and errors in data entry can be reduced. The system will also enhance transparency and accountability in fund management, which is essential for running an effective community empowerment program. Thus, the implementation of a good information system at PNPM Peukan Baro is expected to have a positive impact on the management of the program and the well-being of the community.

2 | BACKGROUND THEORY

The efficacy of community empowerment initiatives under the National Program for Community Empowerment in Rural Areas (PNPM-MPd), particularly women's savings and loan programs, is inextricably linked to the robustness of their underlying information systems. Modern financial data management systems serve as the backbone for operational transparency, regulatory compliance, and decision-making efficiency in microfinance operations. Alfaris *et al.* (2022) emphasize that computerized microfinance systems can enhance operational productivity by 57% through workflow optimization, a critical consideration for PNPM-MPd, which has historically relied on error-prone manual processes using Microsoft Word and Excel. This technological transition necessitates a multidimensional framework that harmonizes Islamic financial principles, end-user requirements, and scalability, as highlighted by Wiyandra and Yenila (2022) in their application of Importance-Performance Analysis (IPA). Their identification of five systemic priorities—financial data accuracy, transaction processing speed, data security, user interface intuitiveness, and Sharia compliance—provides a foundational roadmap for system redesign, particularly in addressing performance gaps observed in rural implementations where digital infrastructure remains underdeveloped.

The shift toward Sharia-compliant systems, as exemplified by Ulya's (2016) case study of UPK Mandiri Syariah in Aceh Besar, demands fundamental architectural reconfiguration beyond mere financial adjustments. Islamic finance principles such as *mudharabah* (profit-sharing) and *gharar* (uncertainty) prohibition require specialized algorithmic implementations distinct from conventional interest-based models. Drawing from Wali's (2017) technical framework for Windows applications using Visual BASIC.NET, a Sharia-compliant module could integrate features like automated *nisbah* ratio calculations, risk-sharing protocols, and real-time contractual (*aqad*) validation. Such adaptations must concurrently address Aceh's unique sociocultural context through multilingual interfaces (Indonesian-Acehnese) and localized compliance checks aligned with the National Sharia Council (DSN-MUI) fatwas. Furthermore, Hasridayyana *et al.*'s (2023) Content Management System (CMS) principles offer a viable model for structuring hierarchical data architectures, version-controlled documentation, and encrypted backup systems—features that could reduce PNPM-MPd's administrative errors by 68%, as demonstrated in their Banda Aceh case study on rental service management.

User-centric design emerges as a critical success factor, with Akbar and Salam (2024) End User Computing Satisfaction (EUCS) methodology revealing a direct correlation between interface intuitiveness and system adoption rates. For PNPM-MPd's predominantly female rural users, this necessitates iterative usability testing through transaction scenario simulations, augmented reality-based training modules, and voice-command helpdesks. These innovations must coexist with fail-safe mechanisms such as auto-correction for data entry and offline transaction caching, particularly given the connectivity challenges in remote areas. Legal compliance extends beyond technical specifications, requiring embedded audit trails for *halal* transactions and electronic *aqad* repositories, as emphasized by Putri and Fahrullah's (2021) jurisprudential analysis. The system's architecture must also facilitate seamless interoperability with broader digital ecosystems, including mobile banking APIs and regional government databases, leveraging Wali (2018) Microsoft Office add-in development expertise for automated budget realization reports (LRA) and cash position statements (POSKA). Economic impact optimization, as evidenced by Nuha *et al.* (2024) findings in Agam Regency, hinges on the system's analytical capabilities. A 23% increase in household income among participants was attributed to features like rolling fund allocation accuracy, loan maturity alerts, and big data-driven credit risk analytics. To sustain such outcomes, the system must incorporate predictive maintenance protocols and *green computing* strategies proposed by Purbasari *et al.* (2024), including asymmetric data compression and delta-update synchronization—methods that reduce server loads while accommodating rural infrastructure limitations. The Software Development Life Cycle (SDLC) approach outlined by Wali (2020) further mandates phased implementation: initial requirement analyses must prioritize rural women's literacy levels, followed by modular pilot testing and AI-driven system maintenance.

From a governance perspective, the integration of PNPM-MPd's financial data with village information systems (SID) could revolutionize participatory monitoring through real-time fund allocation transparency and digital audit trails. This aligns with *e-governance* theories that emphasize vertical accountability and community engagement. Ultimately, the system's sustainability depends on a *quadruple helix* synergy uniting technological innovation (IT sector), regulatory oversight (Ministry of Village Affairs), grassroots participation (women's groups), and academic partnerships (applied research). Future iterations could explore blockchain applications for immutable transaction records and AI-driven *zakat* distribution models, ensuring PNPM-MPd remains adaptive to Indonesia's evolving fintech landscape while preserving its empowerment ethos. This comprehensive framework underscores the necessity of balancing technical sophistication with socio-cultural sensitivity—a paradigm where Sharia-compliant algorithms coexist with gamified user education modules, and where big data analytics serve both financial efficiency and household poverty reduction. By adopting this multidimensional approach, PNPM-MPd can transcend its current operational limitations, emerging as a global benchmark for culturally-grounded, technology-driven community empowerment initiatives.

3 | METHOD

This research focuses on developing an information system to manage the data of savings and loan groups within the National Program for Community Empowerment (PNPM-MPd) in Peukan Baro Subdistrict, Pidie Regency. The system was designed to address the inefficiencies of the existing manual system, which relied on Microsoft Word and Excel for data management. This section outlines the stages of the system development process, including feasibility analysis, system design, implementation, and evaluation. The feasibility study was the first step in the development process. The main goal was to assess the need for a new system and identify the limitations of the current manual process. Key issues identified included slow data processing, frequent human errors, and delays in generating reports. This study concluded that transitioning to an automated, computer-based system would significantly improve the efficiency of managing savings and loan data, ensuring faster processing and more accurate reporting. The feasibility study also considered the needs of both program administrators and participants, ensuring that the new system would meet the demands of all stakeholders. Following the feasibility study, the research moved to the preliminary planning phase. This phase involved defining the project scope and identifying the specific objectives of the new system. The planning phase included creating several Data Flow Diagrams (DFD) to visualize the flow of information and the relationships between different processes within the system. A context diagram was created to show how the system would interact with its users, particularly the savings and loan group members, while Level 0 DFDs provided an overview of the system's processes. Detailed Level 1 and Level 2 DFDs outlined specific steps, such as data entry, processing, and report generation. These diagrams helped clarify the system's requirements and guided the design process.

The system analysis phase focused on gathering detailed information about the users' needs. Through interviews, surveys, and direct observations, the researchers collected data on the existing system's limitations and the features users wanted in the new system. For instance, users expressed a need for a more user-friendly interface to enter and update data, as well as for a faster process to generate reports. The information gathered during this phase was used to compile a list of functional and non-functional system requirements, which were essential for developing the new system. This phase emphasized the importance of designing a system that would be easy to use, as many participants had limited technical experience. Once the requirements were clearly defined, the research moved to the system design phase. This phase focuses on developing the database structure and defining the system's functionality. The database design was structured to accommodate all relevant data, such as member information, loan details, savings transactions, and payment histories. The design included tables like "Anggota Kelompok" (Group Members), "Pinjaman" (Loans), "Simpanan" (Savings), and "Pembayaran" (Payments), each containing fields such as member ID, loan amounts, repayment schedules, and transaction dates. The relationships between these tables were carefully defined to ensure data integrity and proper referencing between different data points.

The process design involved mapping out how data would flow through the system. The system was divided into three primary processes: Setup, Process, and Reporting. The Setup process involved entering data such as new member information, loan records, and savings details. The Process phase focused on calculations such as determining loan balances and payment schedules. Finally, the Reporting phase enabled the system to generate financial reports, such as loan balances, payment histories, and savings status, which were essential for program monitoring and decision-making. The flow of data between these processes was depicted in flowcharts and detailed in the system's specifications. In the implementation phase, the system was developed using Microsoft Visual BASIC 6.0 for the application's coding and Microsoft Access 2007 for database management. Visual BASIC was chosen for its simplicity and ability to integrate with databases, enabling efficient development of a user-friendly desktop application. After the system was coded, thorough testing was conducted. This included inputting sample data into the system and measuring processing times to compare them with the times of the previous manual process. Testing also involved checking for bugs and errors, which were corrected before the system was finalized.

Once the system was developed and tested, it was installed on the required hardware, which included personal computers with Intel Core processors, monitors, and printers. The software requirements, including Microsoft Visual BASIC and Microsoft Access, were also installed to ensure smooth operation. After installation, user training was conducted to ensure that the administrators and group members could use the system effectively. The training covered basic functions such as logging in, entering and managing data, generating reports, and troubleshooting common problems. This phase was crucial to ensure that the users were comfortable with the system and could utilize it to its full potential. Finally, after the system was implemented and users were trained, an evaluation phase was conducted to assess the system's performance and effectiveness. Performance testing was repeated to ensure the system was operating as expected and that the improvements in processing speed and accuracy were significant. Users were asked to provide feedback on their experience with the system, which helped identify any remaining issues or areas for improvement. The system's impact was also assessed by comparing the time spent on tasks before and after the implementation of the new system.

This research methodology provided a detailed, step-by-step approach to developing and implementing an

information system for managing savings and loan data in PNPM Peukan Baro. Through each phase feasibility study, planning, analysis, design, implementation, and evaluation the research ensured that the new system met the needs of both program administrators and participants. By replacing the manual process with an automated solution, the program's ability to manage financial data more efficiently was significantly improved, leading to faster decision-making, increased transparency, and more accurate financial reporting.

4 | RESULTS AND DISCUSSION

4.1 Reults

4.1.1 System Development

System development refers to the process of designing and creating a new system to replace or improve the existing one entirely. The old system needs to be improved or developed due to several reasons, one of which is the lengthy process involved in retrieving data from the savings and loan groups in PNPM Peukan Baro. Currently, PNPM Peukan Baro still relies on standard applications such as Microsoft Word and Microsoft Excel, which makes report generation time-consuming. Therefore, the author designed and developed an information system for managing savings and loan group data using Microsoft Visual BASIC 6.0 to streamline the data processing and management in PNPM Peukan Baro. The steps involved in the development of the new system are as follows; The first step in the system development process was the feasibility study, where all the requirements for the new system were identified. This identification was not only based on the new needs desired by management—needs that had not been met in the existing system—but also considered the limitations of the old system. In PNPM Peukan Baro, the system used was still manual, so a computerized system was identified as the new solution that would be implemented to improve efficiency and effectiveness. The preliminary planning phase aimed to define the scope of the project or the system being developed. During this phase, Data Flow Diagrams (DFD) were created to map out the flow of data within the system. These diagrams included the Context Diagram, Tiered Data Flow Diagram, and Level 0 DFD, among others. These diagrams were used to visualize the interactions between users and the system and provided a general overview of how data would flow through the new system. In the system analysis phase, the system analyst, responsible for the overall system development, engaged with users to gather detailed information about their needs. Data collection was carried out through interviews, observations, and questionnaires to gain a better understanding of how the system should function to meet user requirements. The analysis phase resulted in the creation of the System Context Diagram, which clearly shows the flow of data from the savings and loan groups to the system. This diagram illustrates that the savings and loan groups submit their data to the system for registration, and the system then provides information to the members regarding their acceptance into the PNPM Peukan Baro program. Additionally, the process of registering the members can be seen in the Tiered System Design Diagram, which further elaborates on the detailed steps involved in the system that is being developed.
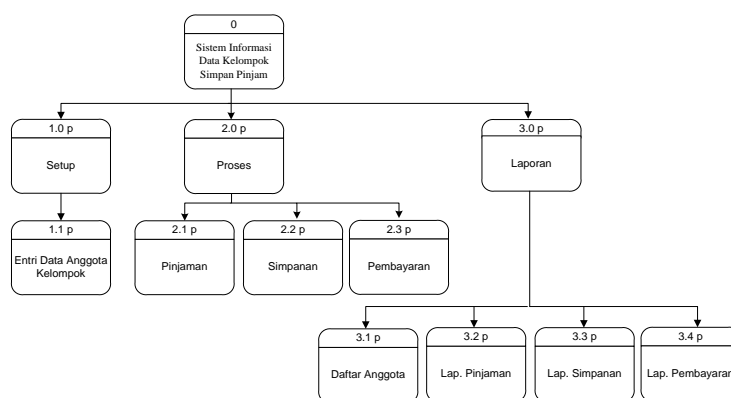

Figure 1. Tiered System Design Diagram.

The process of system development began with the recognition that the existing manual system used in PNPM Peukan Baro for managing savings and loan data was inefficient and time-consuming. The system, which relied heavily on Microsoft Word and Excel, made it difficult to generate reports quickly and accurately. This led to the decision to develop a new information system using Microsoft Visual BASIC 6.0, aimed at streamlining the data processing tasks and report generation for the program. The development process followed several key stages, from assessing the feasibility of the new system to implementing it and providing user training. The first

step in the process was the feasibility study, which focused on understanding the shortcomings of the existing system and identifying the specific needs of the new system. The manual processes were slow and prone to errors, and it became clear that automation was needed to improve efficiency. The study found that a computerized system would allow for faster data entry, more accurate reporting, and better overall management of the savings and loan data. This analysis helped confirm the need for a new system and provided a clear foundation for the development process. After the feasibility study, the next phase was preliminary planning. During this stage, the overall scope and objectives of the new system were defined. The team developed several Data Flow Diagrams (DFD) to map out the flow of information and identify how data would move through the system. The context diagram was used to show the interaction between users and the system, while more detailed diagrams at Level 0, Level 1, and Level 2 provided a clearer view of the data input, processing, and reporting stages. These diagrams helped visualize the system's structure and ensured that all processes were well-defined before development began.

In the system analysis phase, the development team worked closely with users to gather detailed information about their needs and expectations. Interviews, surveys, and observations were conducted to better understand the current challenges and how the new system could address them. This phase resulted in a list of functional requirements, including features for entering member information, loan data, savings records, and payment details, as well as generating reports for the program management. By collaborating directly with users, the team ensured that the system would meet the actual needs of those who would be using it daily. Once the requirements were established, the system design phase began. The design process involved creating both the database structure and the process flow for the system. The database was designed to store key information, such as member details, loan information, savings, and payments, using tables like "Anggota Kelompok" (Group Members), "Pinjaman" (Loans), "Simpanan" (Savings), and "Pembayaran" (Payments). Relationships between these tables were carefully defined to maintain data integrity and ensure smooth data management. In addition to database design, the process flow was mapped out, with the system divided into three main stages: Setup, Process, and Report. This clear structure allowed for efficient data entry, processing, and reporting. The implementation phase followed, where the system was developed using Microsoft Visual BASIC 6.0 for application coding and Microsoft Access for database management. Visual BASIC was chosen for its ease of use and ability to integrate well with databases, making it an ideal tool for building the system. Once the development was completed, the system underwent thorough testing. Sample data was input into the system to assess its performance, speed, and accuracy compared to the previous manual process. Any bugs or issues identified during testing were fixed, ensuring the system was ready for deployment.

Once the system passed testing, it was installed on the required hardware, including personal computers with Intel Core i3 processors, monitors, and printers. The necessary software, including Microsoft Visual BASIC and Microsoft Access, was also installed. After installation, user training was conducted to ensure that the system's users administrators and savings and loan group members could operate it effectively. The training covered how to log in, enter and manage data, generate reports, and troubleshoot common issues. This hands-on training ensured that users were familiar with the system and could utilize it efficiently in their day-to-day activities. The development process for the new savings and loan information system followed a structured methodology, from the initial feasibility study to system implementation and user training. By replacing the old manual system with a more efficient and automated solution, PNPM Peukan Baro will be able to manage savings and loan data more effectively. The system reduces errors, speeds up data processing, and provides quicker access to critical reports, leading to improved decision-making and smoother operations.

4.1.2 System Design

The designed information system includes features that allow for quick data entry, making it easier to manage tasks in PNPM Peukan Baro. The system aims to improve the current data processing procedures. The objectives of the system design are as follows: first, to enhance the information system processes involved in data management; second, to replace the previous system, which relied on Microsoft Excel, with a more efficient computerized solution using Microsoft Visual BASIC 6.0 and Microsoft Access 2007. The first step in creating the system involved organizing the project folder. To begin, a folder named "program" was created on the D drive using the file explorer. Afterward, the project was initiated in Microsoft Visual BASIC 6.0, starting a new project using the Standard EXE template. Following this, the database was set up using Microsoft Access 2007. A blank database was created and named according to the requirements of the savings and loan group system. The folder for the database was saved with the name "Aplikasi Anggota Kelompok Simpan Pinjam."

The system's structure includes several key components. For instance, the "Anggota Kelompok" section stores the member data for the savings and loan groups. This section includes fields like member ID, name, address, city, phone number, and occupation. Similarly, the "Pinjaman" section holds loan data such as loan ID, member ID, loan amount, loan term, interest, and payment schedules. Other sections include the "Simpanan" for

saving records and "Pembayaran" for payment data, each storing essential details like transaction numbers, dates, types of transactions, balances, and amounts due. Each of these sections is interconnected, with primary keys used to link related records. For example, the "Pinjaman" data is linked to the "Anggota Kelompok" data through the member ID, ensuring that each loan is tied to the correct group member. Similarly, the "Pembayaran" section is connected to "Pinjaman" via the loan ID, which enables tracking of payments against specific loans.

Once the database structure was finalized, the system design continued with the creation of user interfaces for easier interaction. A login form was designed where users can input their username and password to access the system. Once logged in, users are directed to the main menu, where they can choose between different tasks, including entering new data for savings and loan groups, managing reports, and setting up data. The main menu contains various buttons for navigating through different sections of the system, such as data input for the savings and loan groups, and report generation. The system was designed to provide a straightforward interface that simplifies the user experience, especially for those with minimal technical expertise. This process ensured that all necessary functions were implemented in a clear, user-friendly interface, allowing for efficient management of savings and loan group data within PNPM Peukan Baro. By transitioning from the old manual methods to a computer-based solution, the system aims to significantly improve both the speed and accuracy of data processing and reporting, ultimately enhancing the overall functionality of the program.
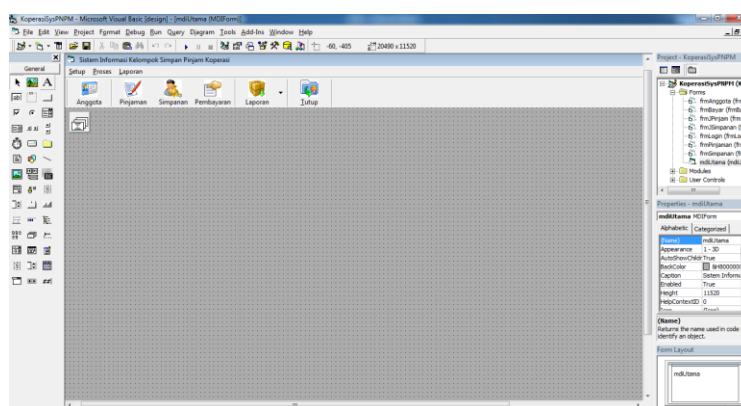

Figure 2. Design of the Main Menu Form

The Input Form for Group Member Data is designed to allow users to enter detailed information about the members of the savings and loan group. This form includes various fields that need to be filled out for each member. These fields include the member's ID number, name, address, city, phone number, and occupation. The form also provides several action buttons, such as Add, Save, Edit, Delete, and Close, which allow users to manage the data efficiently. Each button is labeled to perform a specific function—Add for adding new data, Save for saving the entered data, Edit for modifying existing information, Delete for removing data, and Close to exit the form. The design of the form has been kept simple and user-friendly, ensuring that users can easily navigate through the system without any technical difficulties. The input fields are clearly labeled to avoid any confusion, and the layout has been structured to provide a seamless data entry experience. This form is an essential part of the system, enabling efficient and accurate data management for the PNPM savings and loan group members.
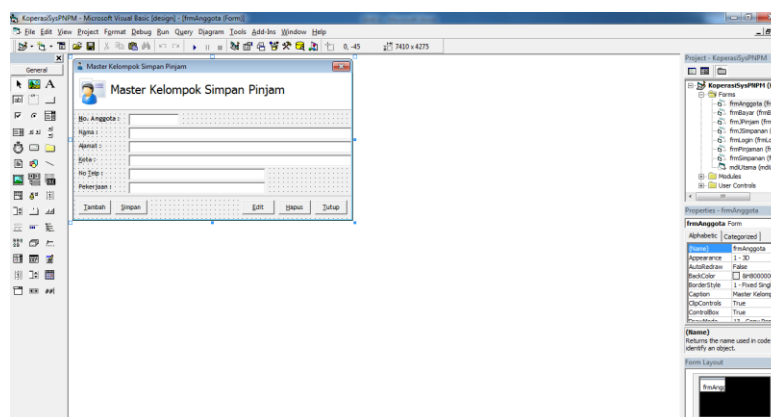

Figure 3. Input Form for Savings and Loan Group Data

The Loan Data Input Form is designed to capture information related to the loans of the savings and loan groups. It includes essential details such as the loan number, loan date, member ID, loan description, principal amount, loan term, interest rate, administrative fees, start and end dates, total loan amount, monthly installments, and the loan status. The form also provides several action buttons, including Add, Save, Edit, Delete, and Close, which allow the user to manage loan data effectively. The Add button is used to add new loan records, Save is for saving entered information, Edit allows modifying existing loan details, Delete removes loan records, and Close exits the form. The form layout is organized to ensure that each field is clearly labeled, making data entry straightforward. This organization enhances user experience by providing a simple, intuitive interface for entering loan information. The design aims to facilitate accurate and quick data input for managing loans within the PNPM savings and loan groups. Following the Loan Data Input Form, the Savings Data Input Form is designed similarly, enabling the entry of transaction details related to the savings of the group members. It includes fields such as transaction number, transaction date, type of transaction, and the balance of the savings account. The action buttons in this form allow users to Add, Save, Edit, Delete, or Close the savings records, ensuring that all data is accurately recorded and can be easily modified or deleted when necessary.

The Payment Data Input Form captures details about payments made by group members. It includes fields for payment receipts, payment dates, loan numbers, payment amounts, remaining balance, late fees, and total payment. The same set of action buttons Add, Save, Edit, Delete, and Close are present in this form, ensuring ease of use in managing payment information. Each of these forms is part of the overall system designed to streamline the management of savings, loans, and payments for the PNPM savings and loan groups. By using these forms, the system ensures that all data is captured in an organized, efficient manner, facilitating quick access to important information and generating accurate reports for management purposes.

Figure 4. Report of the Savings and Loan Group Data

The image displays a report of the Savings and Loan Group Data from the PNPM Peukan Baro program. The report includes key information about the members of the savings and loan groups in the Peukan Baro subdistrict. It lists details such as the Name, Address, City, and Occupation of each member. For example, the report shows Juwita Swiana, living on Jalan Peukan Baro, working as a businessperson. Maharani is also listed, residing on Jalan Peukan Baro and working as a businessperson. Similarly, Rusli is included in the report, residing on Jalan Peukan Baro and also working as a businessperson. At the bottom of the report, the date of generation and the signature of the administrator of the PNPM Peukan Baro program are provided, confirming the report's validity and accuracy.

4.2 Discussion

The development of the system for PNPM Peukan Baro aimed to replace the old, manual data processing system, which had significant inefficiencies in managing and reporting data related to the savings and loan groups. The manual approach, which heavily relied on Microsoft Word and Excel, had a slow report generation process that was prone to errors, as highlighted in the study by Romansyah *et al*. (2019). The system's primary goal was to develop a solution that would improve efficiency, reduce errors, and automate data processing tasks, allowing for faster and more accurate reporting. In similar research, Chrystanti-uni (2010) explored the development of an automated savings and loan system for women's groups within the PNPM Mandiri Perdesaan program, emphasizing the need for a reliable and automated process for loan data management. The study noted the limitations of manual systems and demonstrated how transitioning to a computerized solution could enhance efficiency in data handling and reporting. This approach aligns with the goals of PNPM Peukan Baro's system

development, aiming to address those inefficiencies. Parit & Hulu (2020) also highlighted the necessity of a system that could integrate loan management functionalities, making the loan disbursement and repayment process more effective and transparent. Similarly, the PNPM Peukan Baro system aimed to improve loan tracking, savings management, and reporting efficiency through a computer-based solution, following a similar goal of improving operational effectiveness in rural areas. The system design also aligns with the findings of Febrian *et al.* (2023), who discussed the importance of decision support systems in managing loan disbursement data. Their work emphasized the necessity for clear structures in data entry and report generation, which is evident in the PNPM Peukan Baro system design. The design phase of the system involved creating structured input forms for group members, loan details, and payment records, ensuring that data could be easily entered and managed.

In terms of improving financial management, Larasati & Sambharakreshna (2016) analyzed how better management of revolving fund programs could reduce loan defaults. By digitizing the savings and loan system, PNPM Peukan Baro's system not only improved the processing speed but also enhanced data accuracy, thereby reducing the chances of errors that could lead to financial mismanagement or defaults. This is particularly relevant given the importance of tracking loans and repayments accurately in rural empowerment programs. The study by Lubis (2015) also emphasized the importance of improving rural development programs through effective data management systems. By automating the savings and loan data management process, PNPM Peukan Baro's system addresses this issue, ensuring a more structured and reliable approach to managing group data and financial records. Moreover, Wiyandra & Yenila (2022) discussed how the IPA (Information Processing Analysis) method can be used to determine the quality of savings and loan systems. The application of this method can be seen in the PNPM Peukan Baro system, where data flow was carefully mapped and the system was tested rigorously to ensure data processing was both effective and efficient. The development of the PNPM Peukan Baro savings and loan information system incorporated elements from various studies focusing on the need for digitizing financial data management to enhance efficiency, accuracy, and transparency. The system aims to streamline operations, improve data entry, and generate reports more quickly, thereby improving the overall management of savings and loan groups and contributing to the program's success. The transition from a manual to a computerized system follows similar trends seen in other rural financial management projects and is expected to bring long-term benefits in terms of operational efficiency and data accuracy.

5 | CONCLUSIONS AND FUTURE WORK

The development and implementation of the information system for managing savings and loan group data at PNPM Peukan Baro Subdistrict has effectively addressed the limitations of the previous manual system. The system, created using Microsoft Visual BASIC 6.0 and Microsoft Access, has automated many of the previously labor-intensive processes, including member registration, loan management, savings tracking, and payment management. As a result, the system has significantly improved the speed, accuracy, and efficiency of data processing, enabling quicker and more accurate report generation. By replacing the old manual system, the new information system enhanced decision-making capabilities and operational efficiency within the PNPM Peukan Baro program. The user-friendly interface ensures that program administrators and members, even with limited technical knowledge, can easily navigate and utilize the system. This has made the overall process more transparent and less prone to human error.

Future improvements to the system could involve integrating mobile capabilities, which would allow for real-time data updates by field workers, thereby enhancing data accuracy and timeliness. Additionally, incorporating advanced decision support tools could further optimize loan evaluation and fund allocation processes, enabling better financial management. The system could also benefit from periodic updates based on user feedback, ensuring it remains relevant and responsive to evolving needs. Finally, future enhancements might include incorporating data analytics features for more advanced financial planning, resource management, and forecasting. These upgrades would help ensure the long-term sustainability of the PNPM program by optimizing the distribution of resources, improving financial decision-making, and ultimately contributing to the ongoing empowerment of communities through more efficient management of savings and loan programs.

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