



Technological Blessings: Optimizing Church Donation Management Through Integrated Data Systems

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Abstract

Religious institutions often struggle with managing donations efficiently, especially when relying on manual processes, which tend to result in errors, delays, and a lack of transparency. This study explores the design and implementation of a Digital Church Donation Management System (DCDMS) for SNT Cathedral. The DCDMS integrates automated, data-driven decision-making and real-time analytics to streamline donation processes, significantly improving transparency and operational efficiency. The system was developed using the Agile Software Development Life Cycle (SDLC), allowing for continuous improvements based on user feedback. Key system features include an automated donor database, customizable financial reporting, and comprehensive security protocols to protect sensitive data. The implementation of the DCDMS resulted in improved financial oversight, increased donor trust, and enhanced overall efficiency.

Keywords: agile methodology, church donation, data system, donation, management, SDLC

INTRODUCTION

Efficient management of financial contributions is crucial for the sustainability and growth of religious institutions, as they heavily depend on donations to fund various activities, maintain operations, and support community programs (Edeigba & Singh, 2022). These institutions are responsible for ensuring that donations are managed in a way that builds trust with donors, fosters transparency, and guarantees accountability. However, as noted by Trotter et al. (2020), traditional methods of managing donations—often manual and paper-based—are prone to human error, delayed reporting, and inefficiencies in tracking contributions. These outdated methods often result in poor financial oversight and difficulty in maintaining accurate records, which can erode donor confidence over time.

Harrison (2023) further highlights that the absence of automation in donation management processes can impede the timely reporting of financial data, making it difficult for religious institutions to demonstrate the transparency required by both donors and regulatory bodies. This lack of transparency can lead to donor skepticism, decreasing the likelihood of future contributions and potentially hindering the church's ability to achieve its broader mission. As such, there is a growing recognition within the faith-based community of the need to leverage technology to enhance the management of donations.

Several studies have underscored the role of digital systems in improving financial management and operational efficiency in non-profit organizations, including religious institutions. According to Kipilimba (2024), the adoption of digital financial systems has led to significant improvements in accuracy, reporting, and donor engagement. For instance, the ability to provide donors with immediate receipts and acknowledgment for their contributions fosters a sense of trust and transparency. Similarly, Amonoo et al. (2023) argue that digital platforms can offer religious institutions the ability to maintain real-time financial records, which are crucial for both internal decision-making and external reporting.

In response to these challenges and the growing demand for more robust financial oversight, the Digital Church Donation Management System (DCDMS) was developed for SNT Cathedral. The system was specifically designed to automate and optimize the management of donations, addressing the cathedral's need for greater operational efficiency, transparency, and accountability. As pointed out by White (2023), digital donation management systems like the DCDMS can reduce the administrative burden on church staff, freeing them to focus on more strategic aspects of ministry and community outreach.

The DCDMS integrates automation and data analytics to enhance the accuracy and transparency of donation tracking. It streamlines key processes, including donation collection, receipt generation, and financial reporting, while maintaining up-to-date donor records in a centralized database. The system also provides church administrators with a comprehensive view of donation flows, enabling them to make data-driven decisions about resource allocation and financial planning. This aligns with the findings of Jikiemi (2024), who emphasize that real-time data analytics in donation management systems can significantly improve decision-making and resource utilization in non-profit organizations.

Developed using an Agile Software Development Life Cycle (SDLC) approach, the DCDMS allows for iterative improvements based on continuous feedback from church administrators and donors. This development method ensures that the

system remains adaptable and responsive to the evolving needs of the cathedral. As Neumann et al. (2020) suggest, agile methodologies are particularly well-suited for software projects in non-profit settings, as they prioritize flexibility, user-centric design, and ongoing refinement, leading to systems that are more aligned with user needs.

Generally speaking, DCDMS represents a strategic response to the challenges faced by SNT Cathedral in managing its donations. By automating and centralizing donation processes, the system not only improves operational efficiency but also fosters transparency, ultimately strengthening donor trust and ensuring the long-term sustainability of the cathedral's financial health. Moreover, the adoption of such a system reflects broader trends in the digitization of non-profit financial management, highlighting the increasing importance of technology in promoting transparency and accountability in religious institutions.

METHODOLOGY

The Agile SDLC methodology was selected for the development of the DCDMS, as it allows for flexibility and continuous feedback, which is critical for ensuring that the final system aligns with user needs. (Hossain, 2023) Initial discussions with stakeholders, including church administrators and IT experts, identified key system requirements. These included the need for an automated donor database, customizable financial reporting tools, and robust security features. The system's design aimed to integrate these functionalities into a scalable, user-friendly platform that would be easy for non-technical users to navigate, while ensuring security and data protection.

Once the system design was finalized, the development process commenced, with iterative cycles of coding, testing, and integration. This iterative approach enabled the early detection and resolution of issues, ensuring that the system met the intended requirements at each stage of development. Testing was conducted by both IT experts and church administrative users to assess functionality, security, and usability. Functional testing confirmed that the system effectively met operational needs, while performance and security testing verified that sensitive data, such as donor information, was well-protected. User acceptance testing (UAT) was performed to ensure that the system's interface was intuitive and easy to use, particularly for those with limited technical expertise.

Following successful testing, the system was deployed at the SNT Cathedral, where training sessions were held to familiarize end-users with its functionalities. Post-deployment feedback was collected to identify any areas that needed further refinement or additional features. This feedback was then used to inform subsequent updates and improvements, ensuring that the system continues to evolve in response to user needs.

RESULTS AND DISCUSSION

This section presents the findings derived from the implementation and evaluation of the DCDMS at the SNT Cathedral. By analyzing feedback from key stakeholders, evaluating the system's core features, and addressing the challenges that the system overcame, this discussion provides a comprehensive overview of the DCDMS's impact on the cathedral's donation management processes. Diagrams and tables are included to visualize the system's structure, its functions, and its measurable effects on improving the overall management of parish donations.

Initial Challenges in Manual Donation Management

The primary data gathered through interviews with church staff and administrators revealed significant operational challenges stemming from the existing manual donation management system. These issues were consistent with those identified in similar studies examining traditional financial management practices in non-profit and religious institutions. As noted by Mayer & Fisher (2023), manual data entry processes in non-profit organizations often lead to inefficiencies, including a high potential for human error and significant time consumption. At SNT Cathedral, staff members expressed similar concerns, emphasizing that manually entering donation data was not only time-consuming but also error-prone, leading to inaccuracies in records and reporting.

Inaccurate data entry and delayed processing are common drawbacks in manual systems, as highlighted by Moselhi et al (2020), who argued that reliance on human intervention in data management increases the risk of discrepancies and complicates financial reconciliation. This was echoed by the cathedral's staff, who reported frequent discrepancies in financial records that made reconciliation a lengthy and challenging process. Additionally, staff members noted that the time required for manual data processing detracted from their ability to focus on other important tasks related to ministry and community outreach.

Lack of Real-Time Reporting and Security Concerns

One of the most critical issues identified by administrators at SNT Cathedral was the lack of real-time reporting capabilities. According to Sarioguz & Miser (2024), real-time data analytics and reporting are essential for making informed decisions, particularly in financial management, where timely insights into donation trends can guide strategic planning. The absence of such capabilities in the manual system hindered the cathedral's ability to adjust its donation strategies on the fly, as administrators were often working with outdated financial information.

Real-time reporting is increasingly viewed as a crucial feature in modern financial management systems, especially in non-profit sectors where transparency and accountability are paramount (Clerkin et al, 2023). Without this capability, church leaders were forced to rely on incomplete data, delaying their ability to make strategic decisions regarding fundraising campaigns, budget allocation, and resource management.

Furthermore, the manual donation management system at SNT Cathedral lacked adequate data security measures, raising significant concerns among stakeholders. Several staff members and administrators expressed unease about the lack of encryption and access controls in the manual system, which made donor information vulnerable to unauthorized access. These concerns align with the findings of Tirado-Beltran et al. (2020), who emphasize that data security is a key consideration for non-profits managing sensitive donor information. Inadequate security can not only compromise donor trust but also lead to non-compliance with emerging data protection regulations, such as the General Data Protection Regulation (GDPR) and other similar local legislations (Shandilya et al, 2024).

Development of the DCDMS: Automation, Reporting, and Security Enhancements

The challenges identified during stakeholder consultations served as the foundation for the development of the DCDMS. Stakeholders collectively agreed that automation was essential to mitigate human error and reduce the time spent on manual data entry. Automation in donation management systems is increasingly recognized as a key driver of efficiency in non-profits. As outlined by Chenneti (2023), automating routine processes such as data entry and record-keeping can significantly reduce administrative overhead, freeing staff to focus on more strategic tasks. In the case of SNT Cathedral, the automation of donation records has already led to a measurable reduction in errors and has greatly streamlined the reconciliation process.

In addition to automation, enhanced donor management tools were identified as a top priority for the DCDMS. Stakeholders emphasized the importance of maintaining detailed donor profiles and tracking donation histories, which would allow for more personalized donor engagement and help build long-term relationships with contributors. Literature suggests that detailed donor management systems can improve donor retention rates by providing institutions with insights into donor behavior and preferences (Kumar & Chakrabarti, 2023). By offering tailored acknowledgments and tracking contributions over time, the cathedral can cultivate stronger relationships with its donor base, increasing the likelihood of repeat donations.

The Gantt Chart shown below in figure 1 presents the timeline for the development of the DCDMS, divided into six phases: Requirement Gathering, Design, Development, Testing, Deployment, and Review.

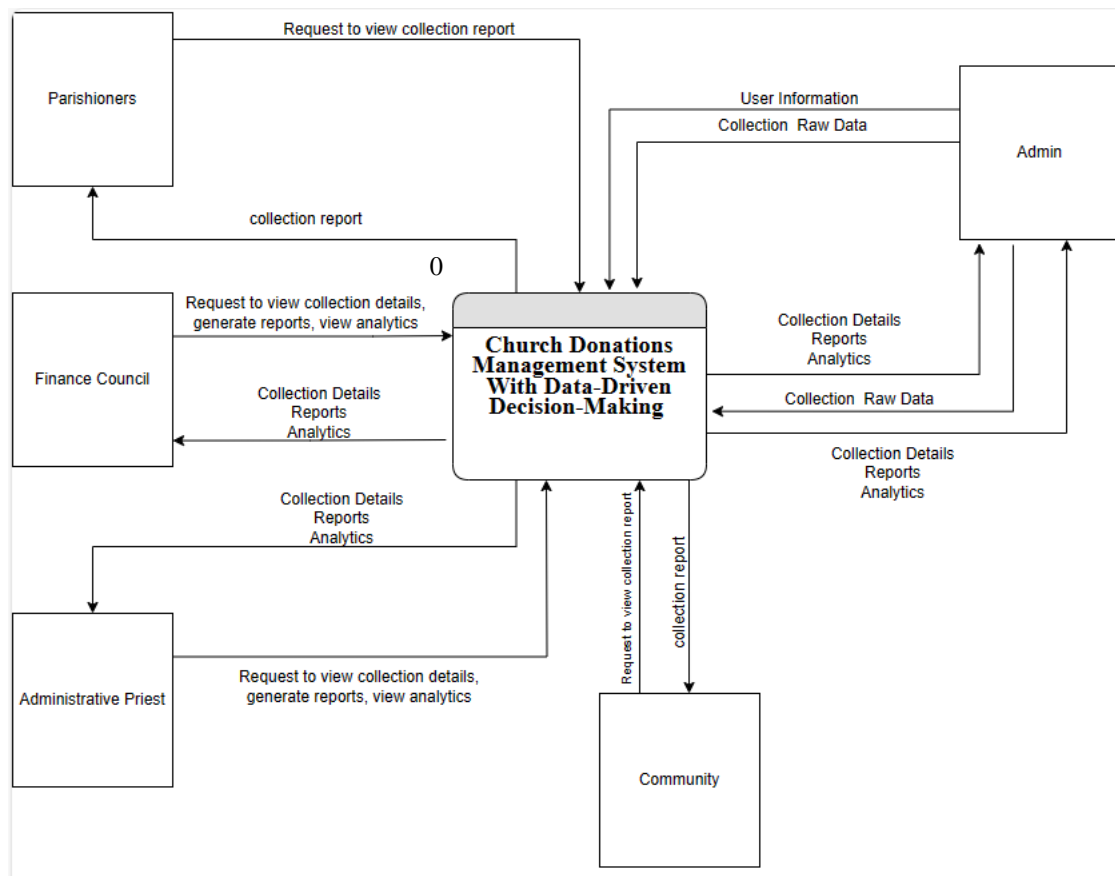
Figure 1. Gantt Chart

Agile Activities	December				January				February				March				April			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Requirement	█	█	█	█																
Design					█	█	█	█												
Development									█	█	█	█	█	█	█	█				
Testing																	█	█	█	█
Deployment																	█	█	█	█
Review																				█

The chart indicates that the Requirement Gathering phase spanned the entire month of December, during which key stakeholders were interviewed to define the system's necessary features. Design efforts occurred in January, focusing on creating wireframes and mockups. Development began in late January and continued through February, with significant attention given to coding the system. Testing was conducted in March to identify and resolve any bugs or discrepancies. Deployment took place in April, with the system rolled out to the parish, followed by comprehensive training for all relevant staff. The Review phase in late April involved gathering feedback from users to guide future improvements. This structured approach ensured that the project stayed on track and that each phase received the necessary attention to detail.

The Data Flow Diagram (DFD) Level 0 (Figure 2), on the other hand, illustrates the overall structure of the DCDMS, showing how various user roles interact with the system's central database.



Figure 2. Data Flow Diagram Level 0 of the Digital Church Donation Management System

Parishioners can request donation reports and receive them after the system processes their request, while collectors manage donation-related data by adding, modifying, archiving, and viewing collection details. Collectors also generate reports and view analytics to track donation trends. The Finance Council and Administrative Priests access detailed collection information and analytical reports to aid in strategic financial oversight and decision-making. The broader community can request donation reports for transparency. This flow ensures that data is consistently processed and stored in a secure, centralized database, facilitating transparency and real-time access to financial data.

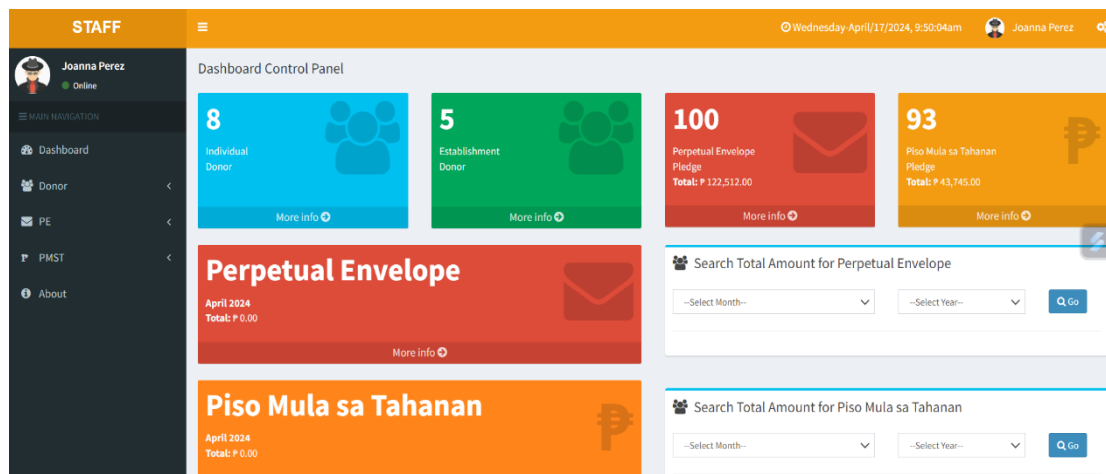
The inclusion of real-time analytics and customizable reports was another key feature demanded by stakeholders. As Klafke et al. (2021) notes, the ability to monitor donation trends in real time is crucial for non-profits, as it enables organizations to adjust their strategies based on current data. For the cathedral, real-time reporting features allow administrators to generate insights on donation patterns, which can inform strategic decision-making regarding future fundraising efforts. Real-time analytics also contribute to greater financial transparency, as they enable church leaders to report donation data to their congregation and donors more promptly and accurately, fostering trust and accountability.

Security was a primary concern throughout the system's development. The DCDMS incorporates advanced security protocols, including data encryption and strict access controls, ensuring that donor information is protected from unauthorized access. As highlighted by Godefroid et al. (2024), non-profits must prioritize data security to safeguard sensitive information and maintain donor trust. The robust security measures integrated into the DCDMS not only protect against data breaches but also ensure compliance with emerging data protection regulations, positioning SNT Cathedral as a responsible steward of donor information.

As a whole, the implementation of the DCDMS at SNT Cathedral has addressed the critical challenges previously identified in the manual donation management system. By automating key processes, providing real-time analytics, and enhancing data security, the DCDMS has significantly improved operational efficiency and financial transparency. These enhancements have not only reduced the administrative burden on staff but also strengthened donor trust, ensuring that the cathedral can continue its mission with greater financial oversight and accountability. The findings from this evaluation echo broader trends in the non-profit sector, where the integration of digital financial management systems is proving essential for improving transparency, efficiency, and donor.

The implemented system provided several improvements over the old manual process. The system's dashboard (Figure 3) presents real-time data on donations, collection histories, and overall financial health.

Figure 3. Dashboard



The dashboard allows staff to monitor trends and make informed decisions quickly. (Solanki et al, 2024) The system design assigns specific functions to different users, ensuring data privacy and operational efficiency. For example, parishioners can request their donation records, while collectors manage accounts and generate detailed reports. Members of the Finance Council and Administrative Priests have access to broader analytics for strategic planning. These role-specific functionalities reduce the burden on any single group and improve overall system usability.

The cost of implementing the CDMS is outlined in Table 1.

Table 1. Project Cost Analysis

Description	Estimated Cost
Office Computer	42,260.00php
3-in-1 Printer	26,030.00php
Total Cost	68, 290.00php

The primary expenses included the procurement of an office computer and a 3-in-1 printer, with a total cost of PHP 68,290. This budget allocation covered the hardware necessary to support the system, ensuring efficient data processing and report generation.

During the testing phase, the system underwent rigorous evaluation by both IT experts and parish staff. The results showed that the system successfully handled large datasets without performance issues. Minor bugs were identified and resolved, ensuring a smooth user experience. Feedback from staff confirmed that the system was intuitive and required minimal training. The deployment phase included comprehensive user training sessions to ensure a smooth transition from the old system to the new one.

One of the most critical aspects of the system was the integration of advanced security measures. The system uses data encryption to protect sensitive donor information and ensures that only authorized personnel can access specific data. Regular security updates are planned to maintain compliance with evolving data protection regulations.

Conclusion and Recommendations

The implementation of the Digital Church Donation Management System (DCDMS) at the Cathedral has resulted in significant improvements in the management of donations. By automating critical processes such as donor tracking and financial reporting, the system reduced administrative burdens, enhanced financial transparency, and strengthened the church's relationships with its donors. The system's real-time analytics, customizable reporting, and strong security features were key contributors to these improvements, making it a valuable tool for optimizing donation management.

To further enhance the system's functionality, it is recommended that performance optimization be prioritized, particularly in refining the algorithms and database structure to handle larger volumes of data more efficiently. Additionally, the system could benefit from integration with other church management platforms, such as event management or membership tracking systems, to provide a more comprehensive solution. Offering continuous training and support to users is also important to ensure that they are able to make full use of the system's features and functionalities. Future updates should continue to be guided by user feedback, ensuring that the system evolves to meet the changing needs of the church and its community.

In conclusion, the DCDMS has proven to be an effective and scalable solution for managing donations in a religious institution, providing valuable lessons for other organizations looking to modernize their financial operations. By continuously improving the system's performance and expanding its capabilities, St. Nicholas of Tolentine Cathedral can ensure that its donation management processes remain transparent, efficient, and donor-friendly for years to come.

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