



Web-Based Tuition Payment Application System at SDIT Fidarussalam South Cikarang

Arif Susilo^{1*}, Lukman Purnama²

¹Universitas Pelita Bangsa, ²Institut Cibi Solusindo

Email: arif.susilo@pelitabangsa.ac.id

Abstract

This study aims to design and implement a web-based tuition payment system at SDIT Fidarussalam, Cikarang Selatan. The research was motivated by the manual payment recording process that often caused errors, duplication, and potential data loss. To address these issues, the study applied the waterfall development model, which includes stages of requirement analysis, system design, coding, testing, and maintenance. Data collection was conducted through observation, interviews, and literature study. The system was developed using PHP and MySQL, while UML diagrams were employed as design tools. The results show that the system enables efficient, accurate, and structured data management. Key features include student data entry, payment processing, receipt generation, and reporting. Black-box testing confirmed that all functional requirements were successfully met, and the system operated as expected. The implementation of the web-based tuition payment system significantly improves administrative efficiency and accuracy compared to the previous manual method. It reduces human error, prevents data duplication, and minimizes the risk of data loss. Moreover, it streamlines payment processes and facilitates better record management. In conclusion, this research demonstrates that adopting a web-based application can enhance school administration by integrating technology into financial management. The system provides a reliable solution for managing tuition payments while ensuring data security and supporting decision-making through comprehensive reporting features.

Keywords: Information System, Web Application, Tuition Payment, Waterfall, UML

Introduction

Advances in information technology have significantly transformed the way educational institutions manage administrative and financial processes, particularly in the digital era where efficiency, accuracy, and transparency are paramount. Schools are increasingly expected to adopt computerized systems to replace manual methods that are prone to errors and delays. At SDIT Fidarussalam, tuition payments (SPP) were still managed manually through the use of payment cards and handwritten receipts. Such practices often resulted in frequent errors, duplication of records, misplaced data, and challenges in generating timely and accurate financial reports. These shortcomings not only complicated the work of administrative staff but also created dissatisfaction among parents who expected more transparent and efficient payment services.

As the number of students continues to grow, manual payment management systems have become increasingly inefficient and unsustainable. This situation underscores the urgent

need for digital solutions that can streamline processes, minimize human error, and enhance service quality. In line with the trend of digital transformation in education, several previous studies have emphasized the importance of developing computerized SPP payment systems to ensure better accuracy, reliability, and efficiency in financial data management (Airlambang et al., 2021; Rochman et al., 2018). Moreover, the implementation of web-based applications provides greater accessibility for stakeholders, allowing both administrators and parents to monitor financial transactions in real time.

In response to these challenges and opportunities, this study seeks to develop a web-based SPP payment system for SDIT Fidarussalam using the waterfall model. The model was chosen for its structured and systematic approach, which allows clear documentation and step-by-step validation at every stage of development. Through the integration of technologies such as PHP for application development and MySQL for database management, the proposed system is expected to enhance the efficiency, accuracy, and accessibility of tuition payment data management. Ultimately, this research contributes not only to the digital transformation of SDIT Fidarussalam but also provides a practical reference for other educational institutions facing similar administrative challenges.

Method

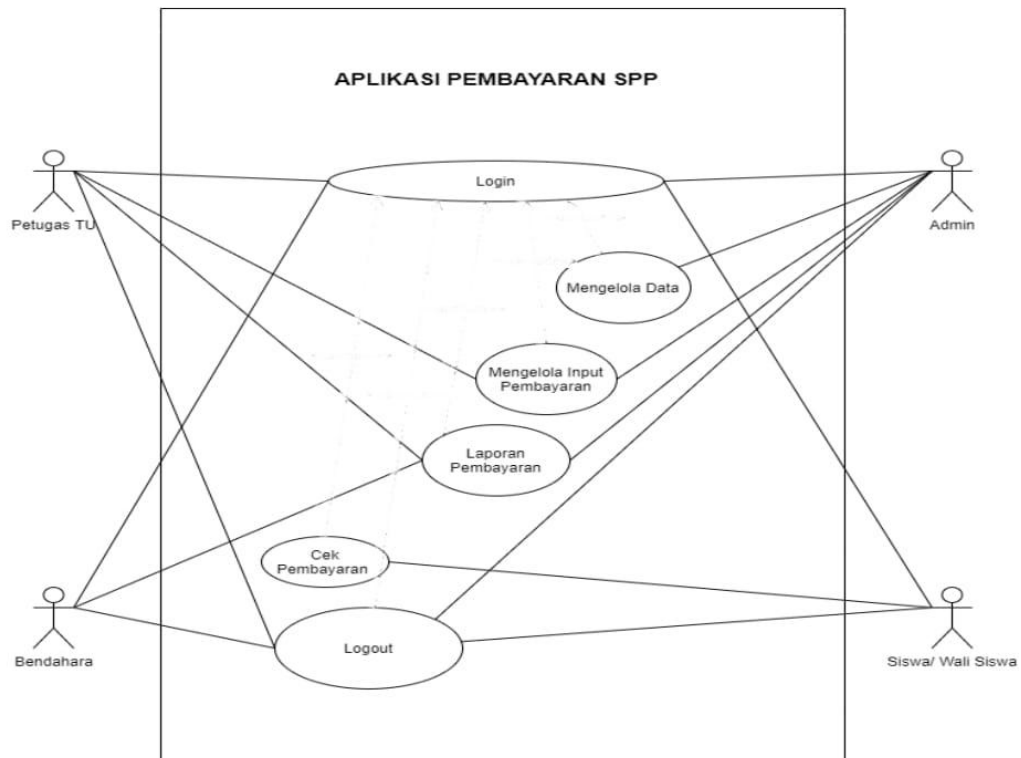
This research was carried out at SDIT Fidarussalam, Cikarang Selatan, in 2025, with the primary objective of designing and implementing an information system tailored to the school's administrative needs. The study employed a descriptive research method combined with a system development approach based on the waterfall model, which is widely recognized for its structured and sequential process in software engineering. The stages of the methodology began with a comprehensive requirement analysis, conducted through close engagement with school stakeholders to identify both functional and non-functional needs of the system. Following this stage, the system design was developed utilizing Unified Modeling Language (UML) tools, specifically use case diagrams to map user interactions, activity diagrams to model workflow processes, sequence diagrams to represent system behavior over time, and class diagrams to define data structures and relationships.

The design phase was then translated into system implementation through coding, where PHP served as the programming language for application development due to its compatibility and efficiency for web-based systems, while MySQL was employed for database development to ensure robust data storage and retrieval. To support the accuracy and depth of system requirements, data collection techniques included direct observation of administrative workflows, structured interviews with administrative staff to capture operational challenges, and an extensive literature review to strengthen the theoretical foundation of the system design.

Finally, to ensure the reliability and validity of the developed system, Blackbox testing was applied. This testing method focused on evaluating the functionality of the system against predefined requirements without examining internal code structures, thereby ensuring that the system met user expectations in terms of usability, efficiency, and accuracy of outputs. The structured application of these methods ensured that the research maintained methodological rigor while addressing practical needs within the school's administrative processes.



Use Case Diagram of SPP Payment System



Results and Discussion

The developed application provides different access rights for Admin, TU staff, Treasurer, and Students. Main features include tuition data input, automated receipt generation, real-time payment reporting, and secure data storage. Database tables were designed to manage student, class, academic year, and payment records. The interface was designed to be user-friendly with clear navigation. Blackbox testing confirmed that all functional requirements worked correctly, ensuring the system's reliability. Compared to the manual system, the web-based application reduces errors, improves reporting speed, and increases data accuracy.

In addition to the core functionality, the implementation of the web-based tuition payment system brought several notable advantages and practical implications that contribute to its value in the educational context. First, the system promotes transparency between parents, students, and the school administration by allowing real-time access to payment records. This minimizes disputes regarding tuition fees and provides evidence-based tracking of financial transactions. Second, the system enhances accountability for school staff since every transaction is automatically logged, reducing the possibility of human error or manipulation of data. Furthermore, the system improves efficiency by streamlining the workflow. For example, administrators no longer need to manually compile monthly reports

because the system can automatically generate detailed summaries covering payment completion rates, outstanding balances, and overdue tuition.

This feature enables school leaders to make informed decisions quickly and allocate resources more effectively. Another important aspect is scalability. Although the current implementation is designed for SDIT Fidarussalam, the modular architecture of the system allows it to be adapted to other schools or even larger educational institutions with minor adjustments. The use of PHP and MySQL ensures compatibility with a wide range of servers and provides an affordable solution for schools with limited budgets. In terms of system testing, blackbox testing did not only confirm that requirements were met but also highlighted areas for future improvement. For instance, while the system performed reliably under normal usage, heavy load scenarios revealed potential optimizations for database queries and caching strategies. This insight is valuable for guiding future upgrades when the system is deployed at scale. From the perspective of user experience, feedback from administrative staff and teachers indicated that the system was intuitive and required minimal training. Parents also expressed satisfaction with the convenience of accessing payment information online.

Nevertheless, suggestions were made to integrate mobile payment gateways, such as bank transfers and e-wallets, which would further simplify the payment process. Overall, the discussion highlights that beyond improving accuracy and reducing errors, the system represents a step towards digital transformation in education. By replacing manual procedures with a secure and automated platform, schools can reallocate human resources towards more strategic educational tasks, such as student development and curriculum improvement. This not only strengthens administrative efficiency but also aligns with broader national initiatives to embrace digital technologies in public services. The combination of usability, scalability, and transparency demonstrates the potential of this system to become a model for similar institutions facing challenges in financial administration.

Conclusion

The development of a web-based SPP payment application at SDIT Fidarussalam has proven effective in overcoming the limitations inherent in the previous manual system. By replacing payment cards and handwritten receipts with a computerized platform, the system has significantly improved efficiency in the management of tuition payments, minimized human errors, and enabled the generation of timely and accurate financial reports. Beyond its operational benefits, the system also provides a secure and reliable database that ensures long-term data storage and easier access to information, thereby supporting transparency and accountability within the institution's financial management processes.

This research contributes to the broader discourse on digital transformation in educational institutions, highlighting how simple yet well-structured technological interventions can bring tangible improvements to administrative workflows. The adoption of the waterfall model ensured that each development stage was systematically implemented, resulting in a solution that is both functional and aligned with the institution's specific needs. Practically, the system enhances the quality of service provided to parents and supports school administrators in making better financial decisions through more accurate data management.

	Review: Journal of Multidisciplinary in Social Sciences Volume 02 No 08 August 2025 E ISSN : 3031-6375 https://lenteranusa.id/	
---	--	---

For future development, the system can be further enriched by incorporating advanced features such as mobile access to support user flexibility, integration with banking or e-payment services to streamline transactions, and detailed financial analytics to assist in strategic planning and budgeting. These enhancements will not only strengthen the system's usability but also align with the growing demands for digital services in education, ensuring that SDIT Fidarussalam remains adaptive and responsive to technological advancements.

References

- Airlambang, D., Pramudya, S. A., Ardiansyah, M., Wijarnako, B., & Susyanto, M. D. P. (2021). Aplikasi Pembayaran SPP Berbasis Web pada Sekolah MAN 15. *Jurnal Ilmu Komputer dan Bisnis*, 12(2), 99–110. <https://doi.org/10.47927/jikb.v12i2.147>
- Rochman, A., Sidik, A., & Nazahah, N. (2018). Perancangan Sistem Informasi Administrasi Pembayaran SPP Siswa Berbasis Web di SMK Al-Amanah. *Jurnal Sisfotek Global*, 8(1). <https://doi.org/10.38101/sisfotek.v8i1.170>
- Denih, Wendasmoro, R. G., & Ramos, S. (2022). Rancang Bangun Aplikasi Pembayaran SPP Berbasis Web (Studi Kasus: SMK Tri Patria Nusantara Kabupaten Bogor). *Jurnal Manajemen Informatika Jayakarta*, 2(1), 125–131.
- Solang, J. R., Munaiseche, C. P. C., & Kenap, A. A. (2021). Aplikasi Pembayaran SPP Berbasis Web di SD SMP Advent Tondano. *Jurnal Edutik*, 1(6), 646–658. <https://doi.org/10.53682/edutik.v1i6.3250>