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DESKTOP-BASED TUITION ADMINISTRATION INFORMATION SYSTEM USING MICROSOFT VISUAL C#.NET AT SMK DAARUL ABROOR, TASEK MALAYA REGENCY

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Abstract. The development of information technology encourages schools to adapt in administrative management, including the payment of Sumbangan Pembinaan Pendidikan (SPP). At SMK Daarul Abroor, Tasikmalaya, the recording system is still manual using ledgers and Excel, making it prone to errors, difficult to trace, and slow in reporting. This study aims to develop a desktop-based SPP administration information system using Microsoft Visual C#.NET, while the system development method applies the Prototype model with analysis tools such as flowmap, context diagram, data flow diagram (DFD), and entity relationship diagram (ERD). The resulting system can record payments, monitor student status, and generate automatic financial reports. Thus, the efficiency, accuracy, and transparency of school administration can be significantly improved.

Keywords: Information System, SPP, Microsoft Visual Studio

1. Introduction

The development of information technology in the digital era has had a significant impact on various aspects of life, including education. The utilization of information technology in school administration management has become an effective solution to improve service quality and operational efficiency in educational institutions. One of the most important aspects of school administration is the management of tuition fee payments (Sumbangan Pembinaan Pendidikan/SPP), which requires a structured, accurate, and transparent administrative system (Saputra, 2022).

With advancements in information systems, life within the school environment has become more practical and efficient. Computers can be used as tools to manage tuition payment data and generate financial reports. Compared to manual methods, computers are more frequently used because they are capable of providing information quickly, precisely, and accurately (Chandra et al., 2025). This greatly assists in the preparation of financial reports. However, when the volume of data reaches hundreds of records, the management process becomes increasingly difficult, and the information produced may be less effective and inefficient. Therefore, more advanced data processing methods utilizing computers are required (Meiryani et., 2021).

This is crucial to ensure that the information generated can be obtained quickly, precisely, and accurately. At SMK Daarul Abroor in Tasikmalaya Regency, difficulties are encountered in managing tuition payments manually, as the process involves large amounts of data and information that must be recorded and organized systematically.

SMK Daarul Abroor, located in Tasikmalaya Regency, is one of the educational institutions that continuously strives to improve the quality of its services, including financial administration management. Based on initial observations, the tuition payment system at SMK Daarul Abroor still relies on conventional methods, with manual recording in ledgers and the use of Microsoft Excel for data recapitulation. This approach

increases the likelihood of errors, which may lead to serious consequences. (Amaliah et al., 2022).

These problems potentially lead to inefficiencies in the tuition administration process and may affect the quality of administrative services at SMK Daarul Abroor. Therefore, an information system is needed to address these issues by optimizing the use of information technology (Krisnawati & Arumsari, 2022).

According to Jonny Seah (2020), an information system is a combination of various information technology components that work together to produce information and establish a communication channel within an organization or group. Wahyudi & Ridho (2020) also state that an information system consists of interconnected components designed to achieve specific objectives.

The selection of a desktop platform using Microsoft Visual C#.NET for the development of the information system is based on several considerations. C#.NET is an object-oriented programming language developed by Microsoft as part of the .NET Framework initiative, making it suitable for building desktop-based applications (Ismail, 2022).

Through this information system, it is expected that the tuition payment administration process at SMK Daarul Abroor will become more effective and efficient, thereby positively impacting the overall quality of school administrative services (Saragih et al., 2022). Furthermore, this system can serve as a foundation for the development of other information systems within SMK Daarul Abroor to support the school's vision and mission in improving the quality of education. (Muchatary, 2022).

Based on the problems described above, the authors are motivated to develop a desktop-based tuition payment data processing system aimed at facilitating the school in managing tuition payment data more quickly and accurately (Marta et al., 2024).

1. How does the current system for SPP (tuition fee) administrative information operate at SMK Daarul Abroor, Tasikmalaya Regency?
2. What proposed system can help simplify and streamline SPP administrative information at SMK Daarul Abroor, Tasikmalaya Regency?

This study employs the prototype method because it refers to an initial model or example of a system designed to test, measure, and validate concepts, designs, or ideas before full implementation. According to (Candra Novitasari, 2020), the Prototype Method is a software development approach and one of the system development methods that uses an iterative and rapid program construction process, allowing the system to be immediately evaluated by users.

2. Literature Review

2.1. Information Systems

An information system is a set of interconnected components used to collect, process, store, and present information to support decision-making (Laudon & Laudon, 2018). In a school environment, information systems play an important role in managing administrative data such as tuition fee (SPP) payments to ensure greater efficiency and accuracy.

2.2. Tuition Fee (SPP) Administration

Tuition fee administration involves the processes of recording, managing, and reporting students' educational payments. Manual systems often cause problems such as

delayed information, data loss, and recording errors (Sutarman, 2012). Therefore, a digital system is needed to accelerate the process and improve data accuracy.

2.3. Web-Based Payment Information System

A web-based information system allows real-time data access through an internet network. Its advantages include automated recording, data security, ease of access, and increased transparency for schools, students, and parents (Jogiyanto, 2014). This type of system is highly suitable for supporting payment administration such as SPP.

2.4. Prototype System Development Method

The prototype method is a rapid and iterative system development approach used to produce an initial model that can be directly tested by users. Through repeated evaluations, the system is refined until it meets user needs (Pressman, 2015). This method is effective for school information systems because it enables adjustments based on user feedback.

2.5. Previous Studies

Research by Novitasari (2020) shows that the prototype method can accelerate the development of school administrative systems and enhance user satisfaction. Meanwhile, Putra (2021) found that web-based payment information systems can reduce recording errors and speed up financial reporting processes in schools.

3. Research Methods

3.1 Research Approach and Design

This study employs a qualitative approach with a single-case study design to analyze how the implementation of a desktop-based SPP (school tuition fee) administration information system can improve the effectiveness of financial management at SMK Daarul Abroor, Tasikmalaya. This approach was chosen to obtain a deep and contextual understanding of the phenomenon in its real-world school environment (Creswell & Poth, 2022). Referring to Novitasari (2020), qualitative descriptive research aims to portray factual conditions without manipulating variables. The case of SMK Daarul Abroor was purposively selected because it represents a vocational high school that still relies on manual recording, making it relevant for examining the impact of digital systems on efficiency, accuracy, and transparency in tuition fee administration.

3.2 Data Sources and Types

This study uses two types of data:

1. Primary data: direct observation of the tuition fee recording process and semi-structured interviews with administrative staff, the school treasurer, and the principal.
2. Secondary data: operational school documents, monthly financial reports, and academic literature related to educational administration information systems and prototype-based software development methods.

Data Collection Techniques

1. Field Observation – conducted to observe tuition fee recording activities before and after the desktop system was implemented (Kristanto, 2020).

2. Semi-Structured Interviews – used to explore user experiences regarding training, ease of use, and perceptions of system benefits (Yusuf et al., 2022).
3. Document Study – carried out to strengthen the theoretical foundation and compare observation results with official school documents (Sugiyono, 2020).

3.3 Data Analysis and Trustworthiness

Data were analyzed using thematic analysis (Braun & Clarke, 2019), which included coding, theme development, and interpretation. Triangulation was applied by comparing observations, interviews, and documents to strengthen validity, ensuring consistent evidence regarding system efficiency, accuracy, and transparency.

Data trustworthiness was maintained through:

1. Source and method triangulation (Lincoln & Guba, 2023), by comparing data obtained from different collection techniques.
2. Member-checking, where informants were asked to verify the interpretations to reduce researcher bias.
3. Credibility, achieved through intensive researcher involvement in the field and systematic documentation.

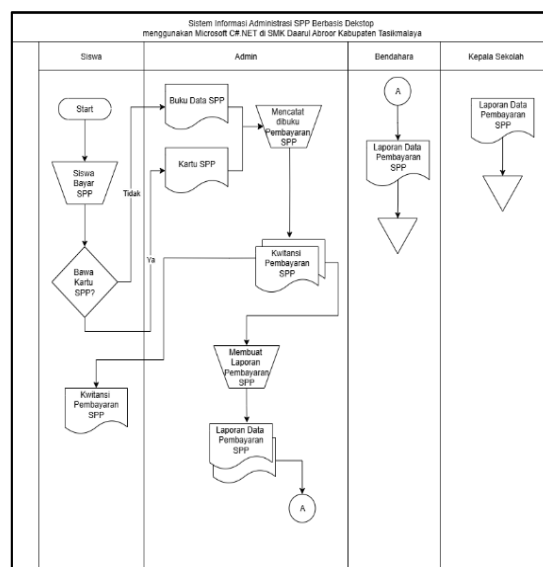
4. Results

4.1 Overview of System Implementation

The findings indicate that the desktop-based SPP administration information system developed for SMK Daarul Abroor in Tasikmalaya successfully replaced the previous manual process using notebooks and Microsoft Excel with an integrated digital system. The system includes essential features such as user login, academic year management, student data input, transaction recording, and automated financial reporting.

The design and development process involved several visualization stages, including:

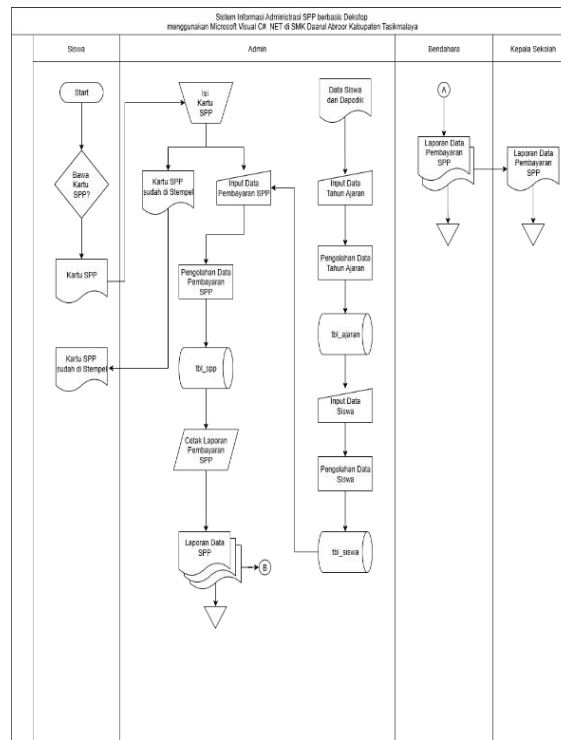
1. Flowmap, illustrating the transition from manual payment recording to digital input, showing how data flows from students to the admin and then to the system.



Source: data processed by the researcher, 2025.

Figure 1. Current System Flowmap

Figure 1 illustrates the existing manual process where students pay tuition fees and the admin records them in books or spreadsheets, often leading to delays and errors.

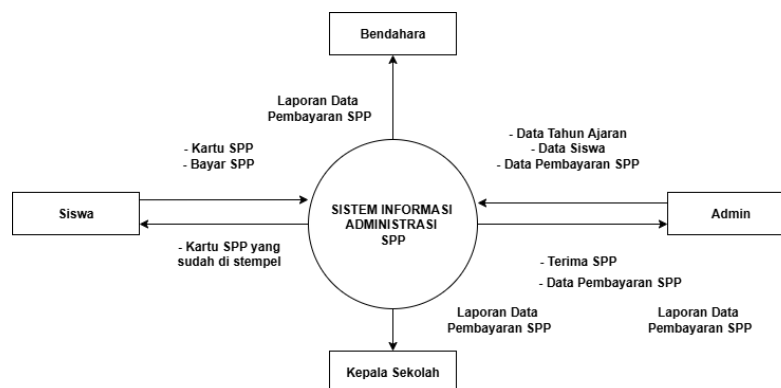


Source: data processed by the researcher, 2025

Figure 2. Proposed Attendance Flowmap

Figure 2 presents the proposed desktop-based system design, integrating login authentication, student data management, payment transactions, and report generation. Automated data flows reduce redundancy and human error while enabling real-time monitoring of tuition payments.

2. Context Diagram, outlining the overall system environment and external entities such as students, admin, treasurer, and principal.

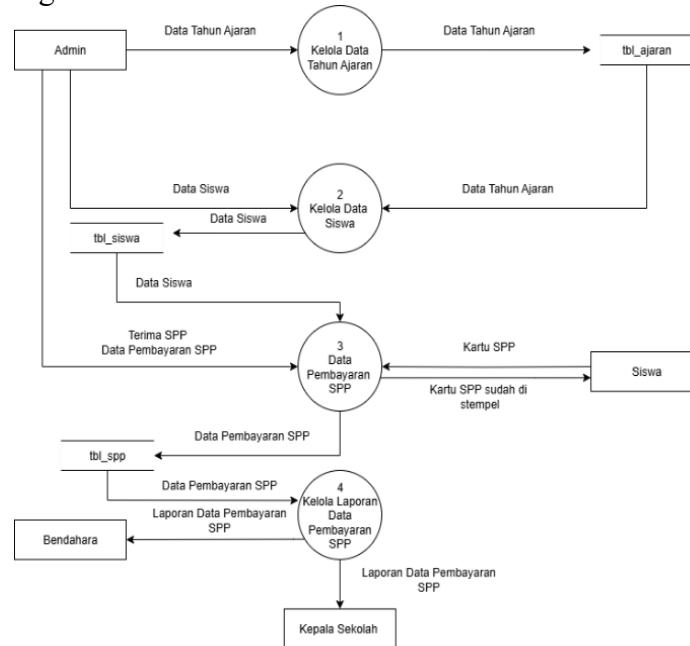


Source: data processed by the researcher, 2025.

Figure 3. Item Diagram Context

Figure 3 Illustrates The diagram shows how students provide payment data, which is processed by the admin, and how the system generates reports for the treasurer and principal.

3. Data Flow Diagram (DFD), representing the logical flow of payment data from input to report generation.

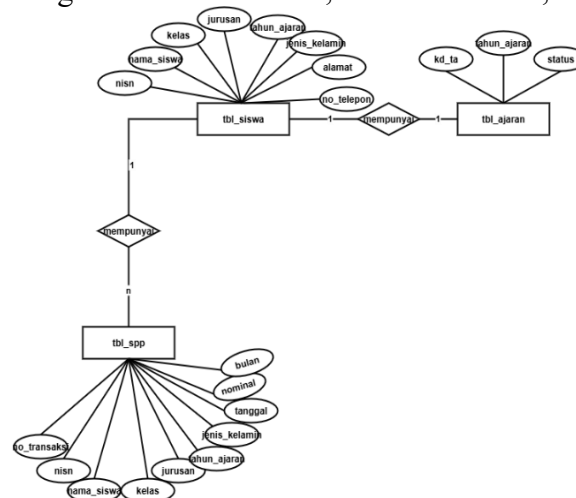


Source: data processed by the researcher, 2025

Figure 4. Item Data Flow Diagram

Figure 4 *DFD* The DFD demonstrates how payment transactions are validated, stored, and transformed into monthly reports.

4. Entity Relationship Diagram (ERD), describing the database structure and relationships among tables such as User, Academic Year, Student, and Payment.



Source: data processed by the researcher, 2025

Figure 5. Item Entity Relationship Diagram

Figure 5 ERD This ensures consistency and integration of data across modules.

5. User Interface (UI) Design, created with user-friendly principles to facilitate use by administrative staff with limited technical backgrounds.



Source: data processed by the researcher, 2025

Figure 6. Login Screen

Each interface was designed to simplify data entry, minimize errors, and provide clear navigation for users. System implementation occurred in three main stages: internal testing, staff training, and full deployment into daily operational activities.

4.2 Impact on Work Efficiency

Prior to the system's introduction, tuition fee recording required significant manual effort and time to consolidate student payment data. After the desktop-based system was implemented, staff reported that the recording process became considerably faster and more structured.

One staff member commented:

"We used to spend hours checking Excel files. Now, with the system, payments are recorded instantly and reports are generated automatically." (Interview, July 2025)

This observation supports previous findings that digitalizing routine processes enhances work efficiency, particularly when systems are intuitive and relevant to user needs. These results reinforce the Technology Acceptance Model (Davis, 2020), which posits that perceived ease of use directly influences productivity and technology adoption.

4.3 Reduction of Manual Errors and Improvement in Data Accuracy

Before system adoption, the school frequently encountered discrepancies between recorded payments and actual student balances. After implementation, these inconsistencies significantly decreased due to the system's auto-validation features that detect duplicate entries and ensure accurate calculations.

The school treasurer stated:

"Previously, reports often didn't match the actual payments. Now, the system automatically validates transactions and generates accurate monthly reports."
(Interview, August 2025)

These findings are consistent with studies showing that digital systems improve data accuracy and minimize human error through automatic validation. Theoretically, this

outcome reflects an enhancement of Human Capital (Becker, 1993), as staff acquire new digital competencies that lead to more precise and reliable outputs.

4.4 Increased Job Satisfaction and HR Adaptation

Beyond operational efficiency, system implementation positively affected job satisfaction and employee adaptation to technology. Most staff reported that the new system simplified their work and reduced administrative burden.

An administrative staff member remarked:

“I wasn’t used to working with desktop applications before, but because the system is simple, I quickly learned it. Now I feel more confident and the job finishes much faster.”
(Interview, September 2025)

This statement illustrates improved self-confidence and intrinsic satisfaction as a result of enhanced digital competence. The finding aligns with Bondarouk (2021) and Al-Qudah et al. (2023), who assert that adopting digital HR systems fosters motivation, a sense of control, and overall job satisfaction.

5. Discussion

5.1 The Design and Implementation Process of the Desktop-Based Tuition Administration Information System at SMK Daarul Abroor

The design and implementation of the desktop-based tuition administration information system at SMK Daarul Abroor demonstrate that the success of digital transformation in educational institutions depends not only on technical design but also on effective change management strategies and the digital readiness of human resources.

During the design phase, the researchers together with the school identified key user needs, such as ease of recording tuition payments, automated reporting, and structured student data management. The system was developed using a user-centered design approach, in which the interface and features were tailored to the abilities of administrative staff who generally had limited technical backgrounds. This approach aligns with the *Digital Readiness Framework*, which emphasizes that system complexity must correspond to users’ digital capacity (Marler & Parry, 2016; Bondarouk, 2021).

The implementation phase was carried out gradually through internal testing, staff training, and full deployment in daily operations. Administrative staff were involved in simulations of data input, login procedures, and payment validation. This process not only enhanced technical skills but also fostered a sense of ownership toward the new system. User adaptation reflects *Change Management Theory* (Kotter, 2012), which highlights awareness, learning, and commitment as key stages in organizational transformation.

At the institutional level, the adoption of this digital system reduced reliance on manual records, which were previously prone to duplication and reporting delays. Strengthening the digital reporting system improved transparency, accelerated decision-making, and facilitated coordination among staff. These findings are consistent with Nguyen et al. (2022) in Vietnam and Rahim et al. (2023) in Malaysia, who concluded that successful digitalization in education is strongly influenced by HR involvement from the design and training stages. Therefore, the system development process at SMK Daarul Abroor can be regarded as a co-creation between technology and people, representing not merely software innovation but also a transformation in work behavior toward greater efficiency and collaboration.

5.2 The Impact of System Implementation on Work Efficiency, Data Accuracy, and Job Satisfaction

The implementation of the desktop-based tuition administration system had a significant impact on work efficiency, data accuracy, and job satisfaction among administrative staff at SMK Daarul Abroor. Before adoption, payment recording often experienced delays, input errors, and inconsistencies between records and actual conditions. After implementation, the time required to manage payment data was drastically reduced, and input errors decreased thanks to automatic validation features.

This improvement in efficiency aligns with the *Technology Acceptance Model* (TAM) proposed, which explains that perceived ease of use and perceived usefulness directly influence user performance and technology adoption. In this context, school staff considered the system easy to use and relevant to their daily tasks, thereby reinforcing their commitment to sustained usage (Sani et al., 2023).

Furthermore, system implementation reflects the development of digital competence among staff, as explained by *Human Capital Theory*. Through repeated use of the system, staff acquired new skills in operating desktop applications, managing data flows, and organizing information systematically. Technology thus served not only as an automation tool but also as a means of enhancing human capital (Seraspe et al., 2024).

Interview data also revealed positive psychological outcomes. Staff stated that their work became easier, faster, and more measurable. These findings are consistent, who argue that simple digital systems such as e-HRM can increase engagement, motivation, and job satisfaction, particularly in institutions with heavy administrative workloads.

From a change management perspective, behavioral shifts at SMK Daarul Abroor were facilitated by effective communication and participatory training. Staff were not passive recipients of instructions but active learners who understood how the system improved their work. This process reflects Lewin's (1951) three-stage change model:

1. Unfreezing raising awareness of problems in the previous manual system;
2. Changing implementing the new system through supported training;
3. Refreezing internalizing new practices until they became part of the organizational culture.

These results correspond with Suryanto et al. (2021) in Indonesia and Teo et al. (2020) in Singapore, who found that digitalization success in schools depends on HR readiness and inclusive change strategies. Similarly, Santiago et al. (2023) in the Philippines observed that digital adoption in education improves efficiency and transparency, though it requires sustained investment in training and cultural adaptation.

Although the proposed system contains technical elements such as automatic validation, real-time reporting, and structured workflows, the main source of performance improvement lies in human–technology interaction. Each feature indirectly serves as a digital learning scaffold for users: task automation reduces cognitive load, real-time feedback encourages self-correction, and standardized forms help users internalize efficient work routines. These mechanisms demonstrate that the system becomes effective not because it “does the work,” but because it trains users to work better.

This aligns with TAM, where perceived usefulness and ease of use foster voluntary adoption; with *Human Capital Theory*, where increased digital competence translates into higher productivity; and with *Change Management Theory*, which assumes that behavioral change is sustained when individuals experience visible benefits during the

transition period. Thus, the tuition administration system is best understood as a human-centered digital transformation tool that stimulates capability building and work adaptation, not merely as a technical platform for payment recording. Theoretical and Practical Contributions (Enaldo & Trinidad, 2025).

Theoretically, this study expands the understanding of *Human Resource Digital Readiness* in the context of vocational schools in Indonesia. It confirms that HR preparedness is the primary determinant of digital transformation success (Iskandar, 2023). The integration of TAM, *Human Capital Theory*, and *Change Management Theory* in this study forms a new conceptual synthesis emphasizing that digital system adoption must be accompanied by sustained investment in HR training and empowerment.

Practically, this study offers a human-centered implementation model for desktop-based information systems, structured in four key stages: user needs analysis, stepwise training, initial mentoring and coaching, and continuous evaluation and improvement. This model can be replicated in other schools, particularly in the education sector facing similar challenges in integrating technology with limited HR capacity

6. Conclusion

Based on an in-depth analysis of the background of the problem, the research questions, and the discussion presented earlier, the authors can conclude several important points as follows:

1. The Tuition Administration Information System at SMK Daarul Abroor, Tasikmalaya Regency is currently still carried out manually, using ledgers to record and recap data through Microsoft Excel and Google Drive.
2. The proposed Tuition Administration Information System at SMK Daarul Abroor, Tasikmalaya Regency can improve efficiency, accuracy, and transparency in managing tuition fee administration. This proposed system not only streamlines administrative processes but also supports the overall improvement of school service quality.

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