



Implementation of Prototype Method in School Payment Information System of SMP AL- Mushlis Karawang

Muhamad Tabrani¹, Suhardi²,

¹Sistem informasi, Universitas Bina Sarana Informatika PSDKU Karawang, Indonesia

²Sistem informasi Akuntansi, Universitas Bina Sarana Informatika PSDKU Karawang, Indonesia

Article Info

Article history:

Received 04 28, 2022

Revised 06 09, 2022

Accepted 06 25, 2022

Keywords:

Information Systems

Prototype Method

ABSTRACT

The development of technology in the field of information systems is currently experiencing a very rapid development, with the presence of an information system, many things can be done easier and faster. For the implementation of tuition payments at Al-Mushlih Junior High School, a web-based information system is needed, which is used for the process of SPP payment services. Currently, the management of school fees payments is still done in the traditional way by entering them in the general ledger, which is very time consuming, especially in the days of school fees payments. Errors often occur when recalling data, and it takes a long time because of the need to check the payment archive in the general ledger. By using a web-based information system, retrieving payment data when needed becomes easier and very fast. The prototype method is used as a reference for system design and development, and it is expected that the new system will facilitate the work of staff and the information produced will be more accurate and precise when reports are generated. Supporting software such as web server, PHP, and Mysql is needed to create a website. The results of the information system created can later process student data, payment data, and transaction data for report generation over a period of time.

This is an open access article under the [CC BY-SA](#) license.



Corresponding Author:

Muhamad Tabrani

Sistem Informasi

Universitas Bina Sarana Informatika

Email: Muhammad.mtb@bsi.ac.id

© The Author(s) 2022

1. Introduction

The rapid development of information technology is, of course, very encouraging, considering that everything man does becomes easier with the development of information technology. Computer technology is one of the most popular technological developments today. The ease of computer technology with all its completeness has provided all information with a high speed and a high degree of accuracy. Therefore, its use is becoming more and more widespread not only in the field of information technology but also in the fields of economy, entertainment, business and also in the field of education. In education, it can be used in the financial books of schools, especially in the payment of tuition. "Accounting is a record-keeping process carried out regularly to collect financial data and information, including assets, liabilities, capital, income and expenses, as well as the amount of the price for the purchase and supply of goods or services, which is completed by preparing financial statements in the form of balance sheets and income statements for the period of the fiscal year [1].

In the SMP IT Al-Mushlih Karawang system, the process of recording tuition data, students still rely on documents that are still in the form of files or archives and do not have the correct storage media, so it can result in a lot of manipulation of payment data by the administration, as well as the filing of documents that are not organized, will be difficult to find when one day the payment data is needed because there is often an accumulation of data, especially when there are more and more data and documents, the circumstances also led to a lack of efficiency in the preparation of the report. So the process of preparing accounting reports takes a relatively long time, because you need to do a recapitulation of these documents. Reports based on the results of such recapitulations are often inaccurate. Based on the results of previous research, the development of a school accounting information system is a solution that exists in schools. It is hoped that a computerized system can solve problems in the administrative and cashiering departments, reduce the percentage of errors and data loss, and facilitate the process of registering new students and paying tuition [2]. By using the tuition information system, the school, especially the administrative department, can be assisted in processing tuition payments quickly, easily and accurately and presenting them in the form of reports. The tuition payment system is well implemented and helps to minimize the problems of Cerdas CERIA Foundation, and the SPP payment process will be more effective and efficient [3].

A system is a collection of elements that are interrelated and cooperate to process the input (input) directed to the system and process the input until it produces the desired result (output) [4]. According to other experts, the system also defines a group of elements that interact with each other to achieve a specific goal [5]. Information systems are a combination of information technology and human activities that use technology to support the activities of companies or organizations. In a broader sense, information systems are more related to interactions between people, process algorithms, data processing, and the use of technology [6]. Information is data that is managed and processed to make sense of it and improve the decision-making process. It plays a role that as the quantity and quality of information increases, the user makes better decisions [7]. Based on the experts' opinions, it can be concluded that an information system is a system that consists of a set of information subsystems for processing data to produce useful information for decision making.

Thus, the SPP payment system that is being designed is expected to be properly implemented and help minimize the problems that occur at Al-Mushlih Karawang IT Junior High School, problems that often occur such as. very long records, many complaints from parents when payments are not in accordance with the existing books, so this is often a debate between parents and financial officials at Al-Mushlih IT Junior High School Karawang, and is expected to help school activities, especially in the administration department in the management of school fees payment data. With an information system, data processing and report generation can be expedited, and the information generated is more accurate, complete, and responsive to needs, so if something goes wrong, it can be minimized." With the computerized process, data processing and report generation can be expedited, and the information generated is more accurate, faster, and more complete, and the form can be designed as needed, so if something goes wrong, this can be minimized. By using the prototype method for an information system that is designed according to the needs and works very well, it can be used as a reference for the development of the information system to be created.[8].

2. Research Methodology

2.1 Software Development Methods

A systematic approach is urgently needed to create software that is effective and in line with the needs of the organization. Prototype model software is used in the creation of data processing applications, SPP payment reports.

Prototype models are used for designing information systems. The prototype model provides program developers and research subjects with the ability to interact with each other during the system design process. Prototypes are one of the approaches in software engineering that directly demonstrate how a software or software components will function in their environment before the actual design phases are performed."[9].

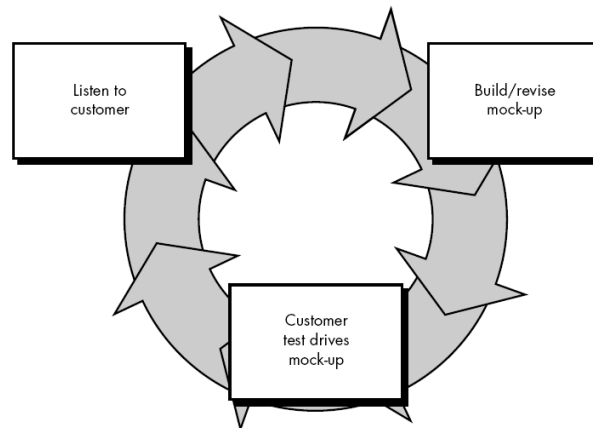


Figure 1. Prototype Method

1. Listening to Consumers
Developers of programs and research objects meet and determine general goals and basic needs. Details of needs may be at the beginning of the collection of needs.
2. Building Mockups
Building Mockups is done after the developer gets the information according to the needs. System design can be worked out if the relevant data has been collected during the collection of needs. This design became the basis for making a prototype. The creation of this prototype is a stage of realizing the prototype design using a programming language.
3. Testing
Testing is the last method used by the author in the creation of information systems, this method is used to find out the shortcomings of the results of making information systems, such as errors and others, this method is used so that when implementing the program there are no gaps in the shortcomings in the program.

Reasons to use the Prototype method [10]:

1. By using the prototype method, it can save costs and time for developing information systems.
2. Developers and users are involved in the design so as to avoid and minimize errors at the beginning of development.
3. Users know the description of the system as well as facilitate the process of implementing the information system that will be used.
4. Users can prepare the right software according to the needs of the information system created.
5. Developers can know what the user expects and wants so that it can be implemented more easily.

2.2 Data Collection Techniques

In research, data collection techniques are the most strategic step because the main goal of research is to obtain accurate and precise data. Data collection techniques can be both quantitative and qualitative. Quantitative research uses numerical data, while qualitative data collection involves more in-depth and contextual data [11]. In the collection of important data related to the information system of the report on transport service CV Fermarse Inti Mulia, the data collection technique consists of:

1. Interview

The interview aimed to get complete information, and to get it, the author conducted a question and answer method regarding all activities related to the system of running tuition payments at schools. In addition, it aims to know the things of the respondents that are more in-depth and the number of respondents is small." [12].

2. Observation

Observation is a complex process, a process composed of various biological and psychological processes. Two of the most important are the processes of observation and memory [12]. The author observes firsthand how the procedure goes for the payment of al Muhlish Karawang Junior High School.

3. Review Study

In this method, the author studies and collects data and information from libraries such as books, articles, magazines, the internet and the files that the author is looking for in accordance with the system to be built [13].

3. Result and Discussion

3.1 System Needs Analysis

Needs analysis is the first step in determining what needs to be created when a developer undertakes a software creation project. Good software that meets the needs of the user depends largely on the success of the needs analysis. A good needs analysis does not necessarily lead to good software, but an improper needs analysis leads to an unusable device. At this stage, the user's information becomes the basis for designing the software [14].

Here are the information needs owned by each user:

A. User Needs

In this system there are two users who can interact with each other, namely: Admin and User.

A.1 Admin Needs Scenario

1. Admins can add student data
2. Admins can view student data
3. Admins can change student data
4. Admins can delete student data

A2. User Needs Scenario

1. User Login with username and password that has been registered and log out
2. User Can make payments online
3. Users Can see the status of payments

B. System Needs

To find out the needs of the system being built, there are 2 kinds of needs that must be known, namely functional needs and non-functional needs. Functional Needs are a type of need that contains what processes the system will later carry out, which include:

- a. The system can log in.
- b. The system can collect student data.

3.2 Software Design

Software Design is a step of software development whose results will be used by software developers to create programs, Software development through a series of steps where each step produces a certain artifact or output [15].

3.2.1 Entity Relationship Diagram (ERD)

ERD (Entity Relationship Diagram) or entity relationship diagram is a diagram used to design a database and show the relationships between objects or entities and their attributes in detail [16].

According to Sukamto and Shalahudin "the Entity Relationship Diagram (ERD) is a diagram used to design relationships between tables in databases [17].

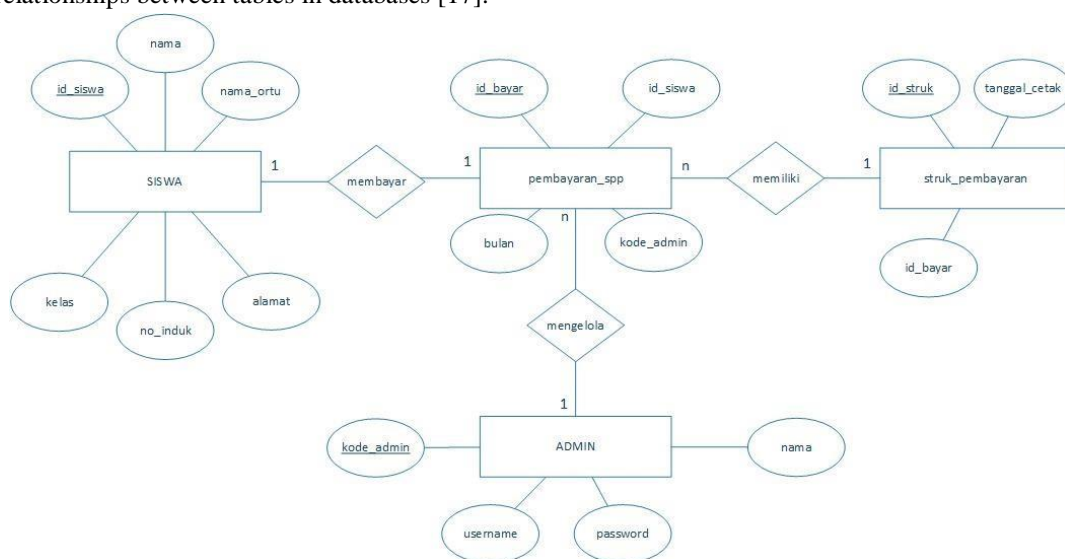


Figure 2. Entity Relationship Diagram (ERD)

3.2.2 Logical Record Structure (LRS)

A representation of the record structure in tables formed from the results between the sets of entities. According to experts, according to Nugraha and Octasia "LRS is a representation of the record structure in tables formed based on the results of relations between entities contained in the E-R diagram"[17]. Logical Record Structure (LRS) is a representation of the structure of records in tables formed from the results of relationships between sets of entities [18].

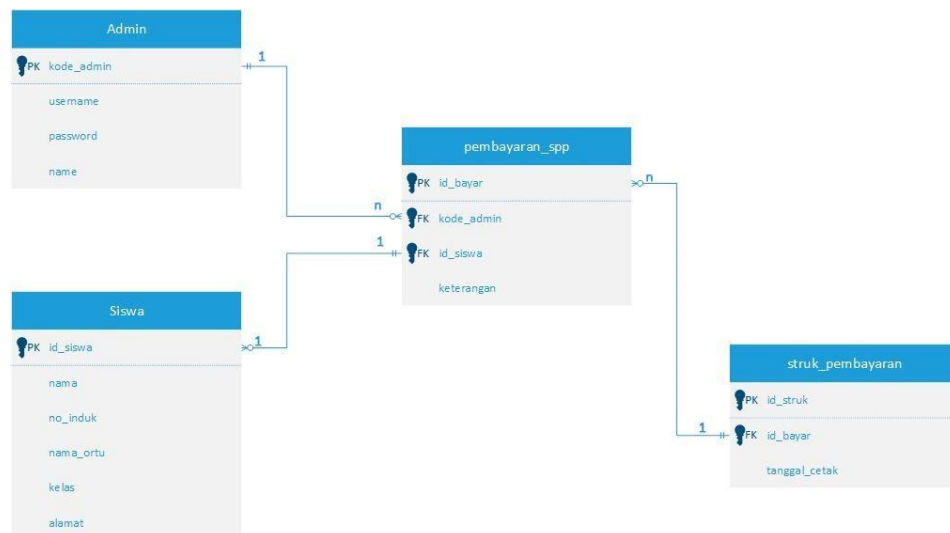


Figure 3. Logical Record Structure (LRS)

3.2.3 Class Diagram

Class Diagram is a diagram that shows the classes in the system and their relationships logically. Class Diagram shows the interaction between classes in the system. Class diagrams are built on use case diagrams and sequential diagrams that have been created accordingly[17]

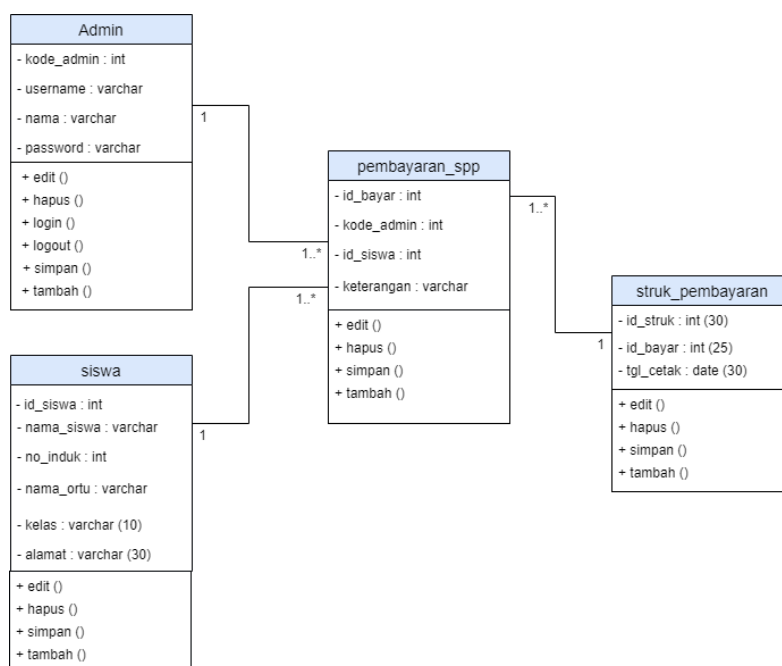


Figure 4. Class Diagram

3.2.4 Sequence Diagram

Tohari posits that "Sequence Diagrams describe interactions between a number of objects in a time sequence"[17]. Rumpel posits that "Sequence Diagrams describe the behavior of actors in the system from the user's point of view. Sequence Diagrams are used to describe interactions between objects but the inside of an object is not displayed. Sequence Diagram illustrates the behavior of objects in use cases by describing the life time of objects and the messages sent and received between objects[19].

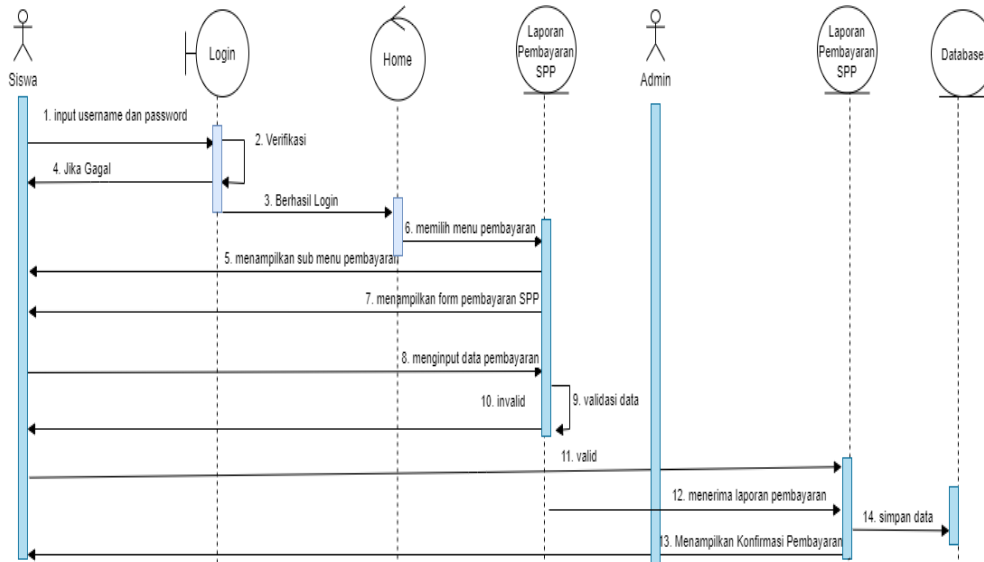


Figure 5. Sequence Diagram

3.3 Interface Design

3.3.1 Login Display

The initial process before entering the system, both admins and users must first log in as a form of security from the school payment information system as a form of security.

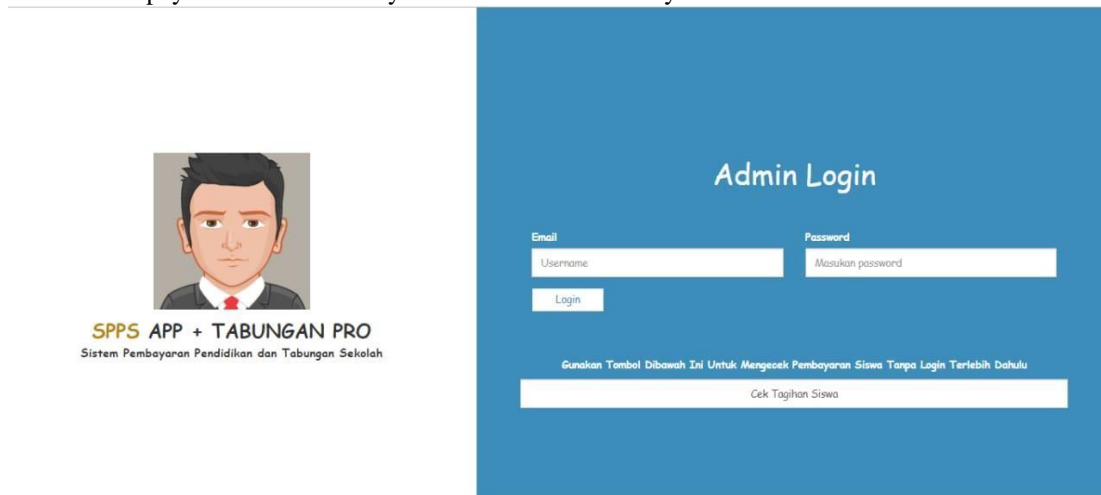


Figure 6. Login page design

3.3.2 Dashboard Display

In this display, there are some income and expenditure information and there is also the identity of the school.

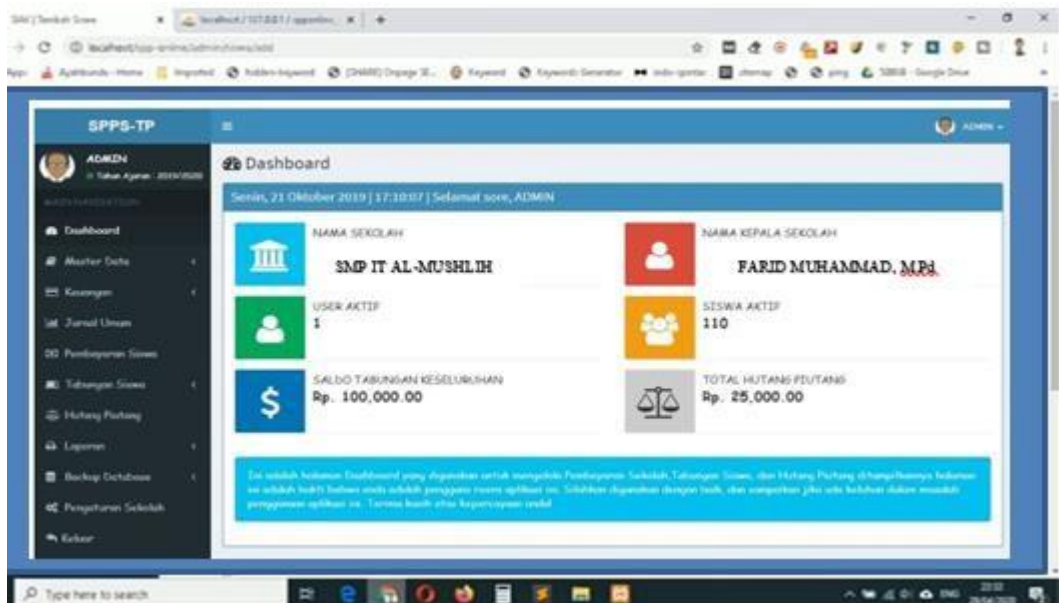


Figure 7. Dashboard Design

3.3.3 Payment Data Display

Display payment data, payment, edit, delete, print and download payment data.

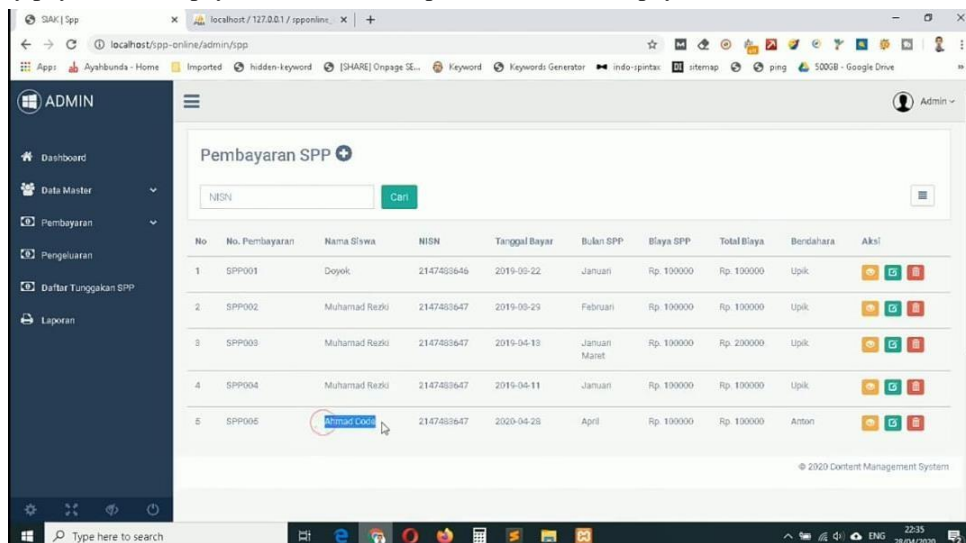


Figure 8. Payment Data Plan

3.3.4 Payment Report Display

Displays the entire receipt data and payment data. There are delete, print, and download menus.

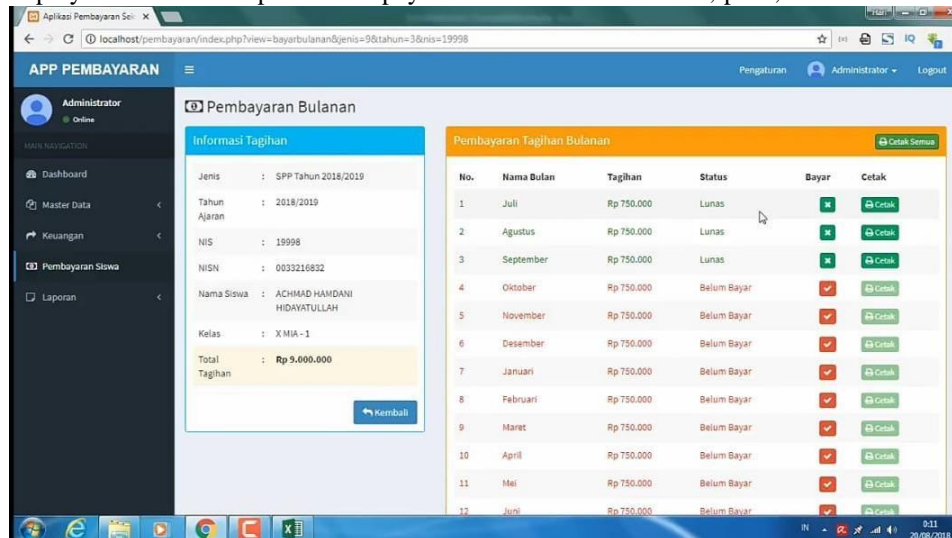


Figure 9. Report Display Design

4. Conclusion

The process of storing master data and student data can be done easily. This makes it easier for the school to record data for payment of school fees. Through the tuition payment application, it can provide information about students who are behind in tuition payment. Through the tuition payment application SPP, you can provide information about the tuition data paid by the student:

1. It is easy to shop master data and student data.
2. The school can record the payment data of students conveniently.
3. Tuition payment application can provide information about students who are behind in tuition payment.
4. Through the SPP application, you can provide information about the tuition fees paid by the student.

References

- [1] Y. Sholeh, "Pembukuan Sederhana Untuk Ibu-Ibu An Nuriyah Arosbaya Bangkalan," *Prosiding SENIAS*, vol. 3, no. 1, 2019.
- [2] J. Saprizon and A. Rahmawati, "Perancangan Sistem Informasi Pendaftaran dan Pembayaran SPP Pada SDIT Ramadanthi Bogor," *repository bsi*, 2020. [Online]. Available: <https://repository.bsi.ac.id/index.php/repo/viewitem/24538>.
- [3] M. L. Tamba, "PERANCANGAN SISTEM INFORMASI PEMBAYARAN SPP PADA SEKOLAH DASAR CERDAS CERIA SUNGAI DAUN BATAM," *library.stmikgici*, 2019.
- [4] E. Pudjiarti and M. Tabrani, "Implementasi Program Pengolahan Data Karir Alumni Pada Bsi Career Center Jakarta," *J. Sist. Inf.*, vol. 7, no. 2, p. 168, 2018.
- [5] H. Wijoyo, *Sistem Informasi Manajemen*. Solok: Insan Cendekia Mandiri, 2021.
- [6] M. Tabrani and H. Priyandaru, "Application of the Rapid Application Development Method to the BAZNAS Zakat Receipt Information System in Karawang," *J. Teknol. dan Open Source*, vol. 4, no. 1, pp. 78–84, 2021.
- [7] abdul kadir, *Pengantar Sistem Informasi*, Cet 1. Yogyakarta: Andi Offset, 2015.
- [8] E. W. Fridayanthie and T. Tsabitah, "Penerapan Metode Prototype Pada Perancangan Sistem Informasi Penggajian Karyawan (Persis Gawan) Berbasis Web," vol. 23, no. 2, pp. 151–157, 2021.

- [9] E. Yanuarti, "Prototipe Sistem Seleksi Penerimaan Pegawai Tugas Belajar," *J. Edukasi dan Penelit. Inform.*, vol. 3, no. 2, p. 111, 2017.
- [10] Admin, "Mengenal Metode Prototype Kelebihan Dan Kekurangan," *BSI.today*, 2022. [Online]. Available: <https://bsi.today/metode-prototype/>.
- [11] Kelas Pintar, "Jenis-Jenis Teknik Pengumpulan Data Kualitatif," 2020. [Online]. Available: <https://www.kelaspintar.id/blog/inspirasi/jenis-jenis-teknik-pengumpulan-data-kualitatif-3181/>. [Accessed: 26-Sep-2020].
- [12] Sugiono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: CV. Afabeta, 2017.
- [13] S. A. Putri, L. A. Utami, and T. Dwianto, "Sistem Informasi Monitoring Perjanjian Kerja Sama Berbasis Web Pada PT Dayamitra Telekomunikasi Jakarta," *J. MEDIA Inform. BUDIDARMA*, vol. 4, pp. 193–200, 2020.
- [14] M. Tabrani and R. Sopandi, "Penerapan Metode Waterfall Pada Sistem Informasi Perpustakaan Desa Pebayuran Kabupaten Bekasi," vol. 11, no. 1, 2022.
- [15] P. W. Wirawan and S. Adhy, "Desain Perangkat Lunak : Konsep dan Tantangannya Prinsip-Prinsip Desain."
- [16] R. Setiawan, "Bagaimana Cara Membuat ERD dan Contohnya," *dicoding.com*, 2021. [Online]. Available: <https://www.dicoding.com/blog/cara-membuat-erd-dan-contohnya/>. [Accessed: 25-Mar-2022].
- [17] R. R. Ranjani, "PERANCANGAN SISTEM INFORMASI PENJUALAN PADA PT DKSH BERBASIS JAVA NETBEANS," in *Semnas Ristek (Seminar Nasional Riset dan Inovasi Teknologi)*, 2022, vol. 6, no. 1.
- [18] D. Oscar and E. Minarto, "Rational Unified Proses Dalam Pembagunan Web Aplikasi Administratif Rukun Tetangga (RT)," vol. 9, 2020.
- [19] M. Pamulasari, H. Basri, and W. Apriliah, "RANCANG BANGUN SISTEM INFORMASI AKUNTANSI PENERIMAAN KAS PADA SKN MOTOR KEBUMEN," *J. Akrab Juara*, vol. 5, no. November, pp. 262–272, 2020.