VOL. 21 (2) (2024), 85-97, p-ISSN: 693-7554, e-ISSN:2654-3990

Information System for Payment of Dues and Savings at SMA Negeri 1 Cibungbulang School Based on WEB

Nurul Kamilah[1*], **Kayum Munajir**[2], **Hersanto Fajri**[3]

[1,2,3] Informatics Engineering, Faculty of Informatics Engineering, Universitas Ibn Khaldun Bogor, West Java, 16143, Indonesia

Abstract

SMA Negeri 1 Cibungbulang, in recording Student Dues and Savings, still uses a spreadsheet application, where transaction recording use spreadsheet application has identified four cases that were complained of by the school administration: first, when recording payment transaction data, there was still an error in data input; secondly, when created the recapitulation report is still less effective and efficient; third when entering the school year the school Administration needs to re-create spreadsheet pages to separate old and new data; fourth transaction data is still prone to be scattered due to manual storage. Because of this, we need a better alternative to managing student finances so that it can be more effective and efficient. This study aims to analyze, design, and build a WEB-based Information System for Student Dues and Savings at SMA Negeri 1 Cibungbulang. The results obtained can improve the performance of the school administration in managing school finances. The system development method used is the waterfall model, which consists of four steps: Requirement Analysis and Definition, System and Software Design, Implementation and Unit Testing, Integration and System Testing. The results of this study obtained an information system that can manage information consisting of student data, class data, monthly dues data, savings, and recapitulation reports with automatically generate recapitulation reports also present a user-friendly user interface design so that errors in payment input and calculating the number of months in one semester do not occur. This information system is aimed at School Treasurer Staff, School Treasurer, and the Principal.

Keywords: *Dues and Saving; Finance; Payment; Information System; Student; School; WEB*

1. Introduction

The development of information technology has made communication easy, especially since the creation of the internet network, communication has become increasingly unlimited and unimpeded. [1]. The use of information technology by an institution or organization can accelerate the access of information, timeliness presentation and produce accurate information, and can provide effective and efficient. [2].

In this case, every individual, company, and agency that uses information technology must be able to develop the system they use, so that they are no longer left behind in the coming era. [3]. This is because the process of working by utilizing technology and information can improve its accuracy, speed, and certainty. [4]. With this information technology, it is hoped that it can overcome problems in data management so that it can help facilitate data management and information presentation. [5].

Bookkeeping SPP payments that are still carried out conventionally have disadvantages, namely, data storage is still in the form of archives that have the potential to be easily damaged/lost and the accumulation of archives. [6]. The SPP payment process is carried out independently and starts with the student going to the payment counter, then providing the SPP payment card along with the payment money which is then recorded by the school treasurer in the SPP payment book and payment card. [7].

*Corresponding author. *E-mail address:* nurul.kamilah@uika-bogor.ac.id
Received: 23 June 2024, Accepted: 27 July 2024 and available online 31 July 2024
DOI: https://doi.org/10.33751/komputasi.v21i2.5260

There are obstacles to managing SPP payment data and information for SPP payments every month, namely the management of SPP payment data still uses the general ledger. [8]. The student payment system still uses a conventional system so that errors and data insecurity can occur. [9]. With the manual process, there are problems in the form of poorly controlled arrears data, for example when facing holidays, the school treasurer must re-collect student arrears so that arrears can be made by parents of students who are still in arrears. [10]. A manual payment recording system is said to be less effective if the treasurer has to recapture the data into a book that can potentially miscalculate the data and make reports. [11]. Large amounts of data will continue to accumulate which makes it quite difficult to store it and when in storage it is prone to damage and data loss. [12].

Given that schools are in the process of heading towards cyber school, it's good to have your web-based system. [13]. The development of appropriate technology and information systems will support educational activities in educational institutions or institutions. [14]. This development demanded a means to accelerate performance and efficiency in school administration, particularly school financial administration such as new student registration, tuition payments, savings payments, and so on. [15].

SMA Negeri 1 Cibungbulang in managing contribution and savings transaction data using a spreadsheet application, where transactions using a spreadsheet application identified four cases complained by TU, namely: firstly when recording payment transaction data, there are still data input errors, secondly when making report recapitulation is still manual where in making recapitulation reports it is still less effective and efficient, thirdly, when entering the school year, the school administration needs to recreate the spreadsheet page to separate the old and new data, the fourth transaction data is still prone to be scattered because of its manual storage.

Therefore, it is necessary to develop a system that can overcome the cases experienced, the system to be developed is shown to carry out more structured financial administration activities using data storage centered in one place that can be accessed by the system in storing and searching data. Thus, the system built can help improve the performance of the Administration in managing school financial administration.

Therefore, based on these backgrounds and problems, the author raised the title, namely: **Information System for Payment of Dues and Savings at SMA Negeri 1 Cibungbulang School Based on WEB.**

2. Methods

The system development method used is the waterfall method, which refers to the concept of Sommerville, I, (2011) in the book entitled Software Engineering 9th edition. [16]. The waterfall consists of the Analysis and Definition of Needs, System and Software Design, Implementation and Unit Testing, and Operation and Maintenance phases. Such as been in Figure 1.

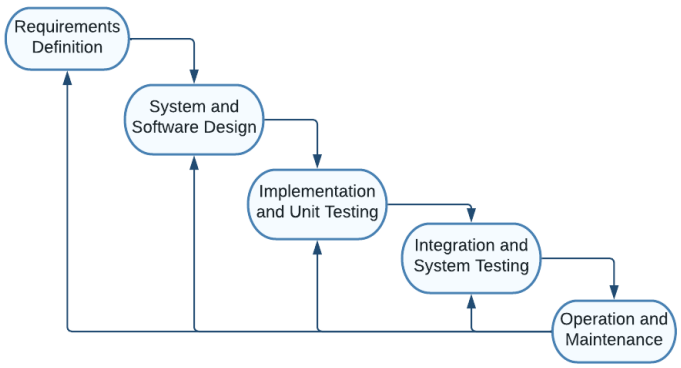

Figure 1. Waterfall model (Ian Sommerville, Software Engineering 2011)

1. Requirement Analysis and Definition

The Analysis and Definition of Needs in this stage is divided into three parts, namely:

a. Problem Analysis

The first stage is carried out through interviews with parties who will use the system, namely: Administrative Officers, through this interview can be unearthed related to information on how the

system works, obstacles or shortcomings of the system, development, and update of the expected system.

b. Functional Needs Analysis

This stage is observed on the running system whose purpose is to find out the problems or weaknesses of the system, so that it can be improved and so that the new system can overcome the weaknesses of the system.

c. Non-Functional Needs Analysis

This stage is obtained from the results of interviews with related parties in the form of sample data, so that it can be limited to sample data that does not need to be used.

2. System and Software Design

System and Software Design, at this stage, the construction of architecture design, interface design and database design begins to be carried out, so that it can be a representation of software that can be reflected before starting coding.

3. Implementation and Unit Testing

This stage is the process of translating designs into programming languages or commonly called coding, coding using the PHP programming language and databases using MySQL.

4. Integration and System Testing

System Integration and Testing in this stage the program units will be connected and tested as one intact system to ensure the systems meet the existing requirements. After that, the system will be sent to the system user, for the system trial using black box testing.

5. Operation and Maintenance

Operation and Maintenance, at this stage, is optional, but this stage can also be mandatory if system development is to be carried out such as adding new features and functions, or if the user experiences problems or there are error fixes found.

3. Result and Discussion

3.1 Requirement Analysis and Definition

1. Problem Analysis

The first stage carried out is problem analysis, which is carried out by interviews and observations at the School Administration regarding ongoing business processes, in the interview the author asks what complaints or obstacles often or still occur when making transactions. This will be presented in Table 1.

Table 1. Problem Identification

User	No	Complaints/Constraints	Why did it happen?
The Principal.	1.	Haven't been able to see the recapitulation report quickly.	The spreadsheet data format used by TU in managing contribution data and report recapitulation is still separate, so TU needs to input contributions again with the report recapitulation format.
School Treasurer Staff, School Treasurer	2.	It is easy to occur human errors when recording transactions.	The spreadsheet data format used to manage contribution data and report recapitulation is still separate, so it needs good concentration every time you make a transaction.
	3	It is still difficult to see students' historical status of dues or arrears.	When students are about to move up in class, TU will recreate a new spreadsheet. For that, TU needs to double-check the student's payment status.

	4	Still needs extra time and energy when updating data on students who will move up in class.	The data design used is still not enough to support making data quickly. For that, the TU will copy the previous student's data sheet, then reset and adjust the data.

2. Functional Requirements Analysis

Functional Needs are the expected results to be built, here are the details as addressed in Table 2.

Table 2. Functional Needs

No.	User	Function needs
1	Admin	Login Manage login user account data Manage student and class data Student Payment Entry and printing receipts View/Print Daily, Weekly, Monthly, and Yearly Reports.
2	School Treasurer Staff	Login Manage student and classroom data Student Payment Entry and printing receipts View/Print Daily, Weekly, Monthly, and Yearly Reports.
3	School Treasurer	Login View/Print Daily, Weekly, Monthly, and Yearly Reports. Set the amount of student payment for each class in general.
	The Principal.	Login View/Print Daily, Weekly, Monthly, and Yearly Reports.

3. Non-Functional Requirements Analysis

Non-Functional Needs are supporting requirements required for the system to run, here are the details as addressed in Table 3.

Table 3. Non Functional Needs

No.	Kind	Description
1	Operational	] Hosting Server / Local Server] Windows/Linux OS] Browser used Chrome and Mozilla Firefox.] Online Internet Connection
2	User	] Can be used as Admin] Can be used by School Treasurer Staff (TU)] Can be used by the School Treasurer] Can be used by the Principal

4. Analysis of Old Business Processes

In the old business process at SMA Negeri 1 Cibungbulang, the School Treasurer Staff managed data still using spreadsheet applications, In the business process of contributions, savings and dpmp two actors interact with each other, namely Students and School Treasurer Staff (TU).

The student meets the TU side and submits the contribution card, then the TU checks the student's payment data, and then records the dues on the daily contribution spreadsheet, and submits back the student contribution card that has been stamped with the school.

And at the end of the year, the principal will request the report recapitulation data to the school treasurer and then the school treasurer will ask the school treasurer staff to make a recapitulation of the annual report, using a spreadsheet of sufficient time and energy in the work. The old business process can be seen on the next page of Figure 2.

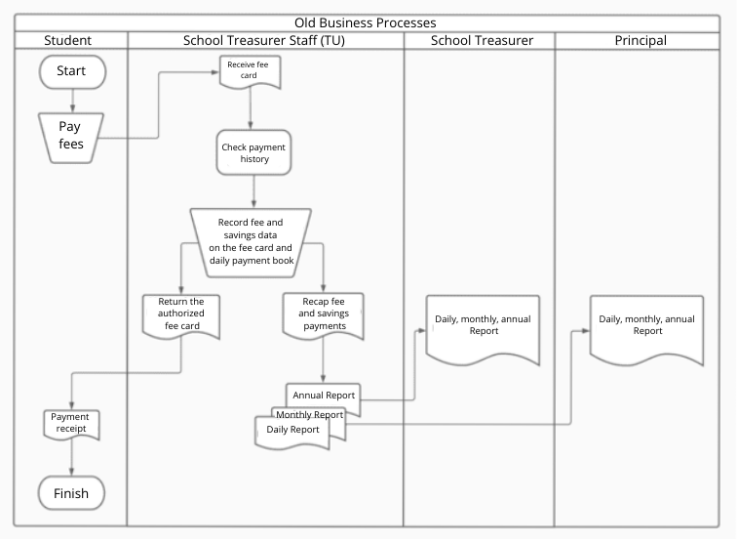

Figure 2. Old Business Process Dues, Savings & Report Recapitulation

5. Analysis of New Business Processes

Based on the results of the analysis of the old business process, the proposed new business process is obtained, although it looks more complex than the old business process, but with a more user-friendly interface design model, the system can handle all work automatically and users will only be asked for a few core inputs.

The system can help users who can later generate annual recapitulation reports, even daily, weekly, and monthly reports automatically without the need to manually recapitulate reports. The new business process can be seen on the next page of Figure 3.

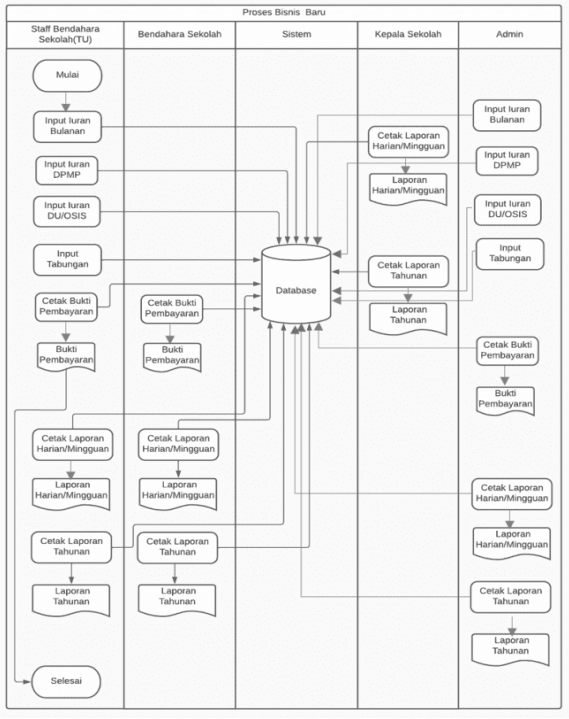

Figure 3. New Business Process Dues, Savings & Report Recapitulation

3.2 System Design

1. Context Diagram

Context Diagrams are the highest level (top level) that describes the relationship between the system and entities outside the system and describes the system as a whole. As shown in Figure 4.

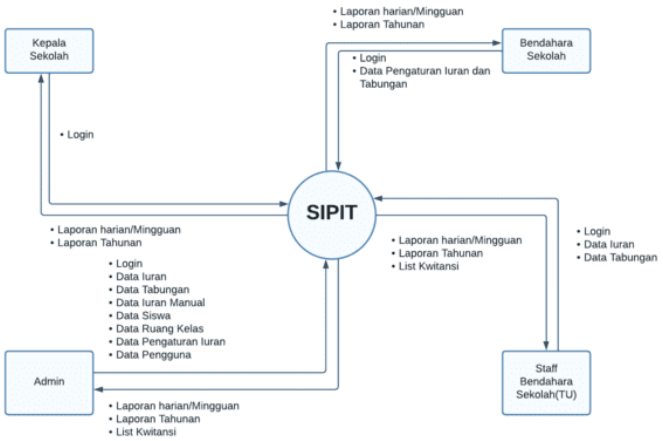

Figure 4. *Context Diagrams*

2. Usecase Diagram

Usecase Diagrams describe the interaction of the user and the system and define the stages needed for the goal to be achieved. As shown in Figure 5.

Figure 5. *Usecase Diagrams*

3. Class Diagram

Class Diagrams describes communication between class objects in a diagram and also modeling which includes attributes, functions and relationships between other classes. As shown in Figure 6.

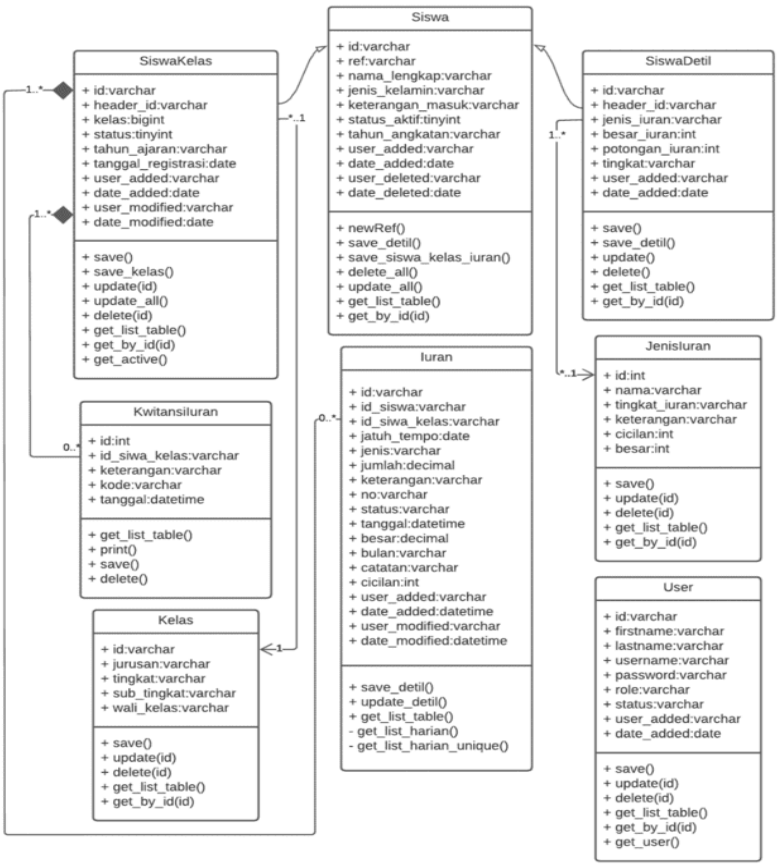

Figure 6. *Class Diagrams*

3.3 System Implementation

1. Login Page

The login page is the process of logging into the application by entering an account identity consisting of a user username/account and a password to get access rights. For more details can be seen in Figure 7.

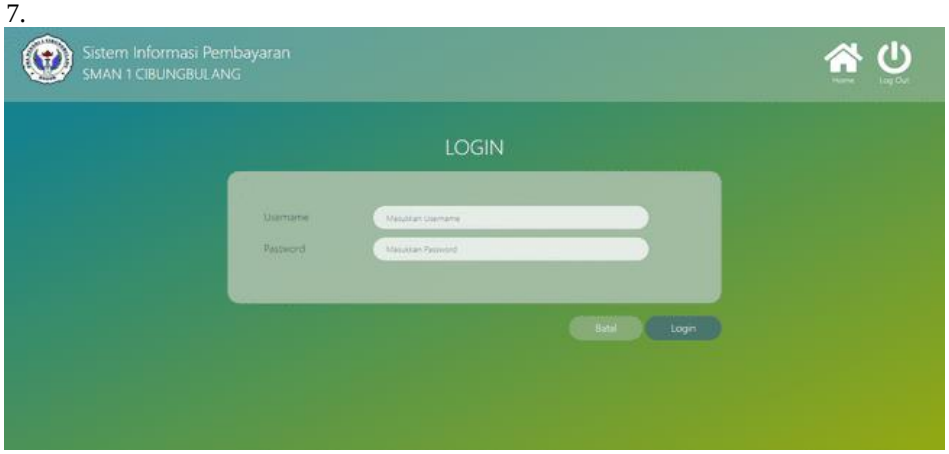

Figure 7. Login Page

2. Main Page

The main menu page is the page that will first open after the admin/user has successfully logged in. There are 3 main menus in the system, namely Transactions, Reports and Management. For more details can be seen in Figure 8.

Figure 8. Main Page

3. Payment Page

This page is a payment transaction page, including Monthly Dues, Savings, DPMP, and DU. For more details can be seen in Figure 9.

Figure 9. Payment Page

4. Receipt Page

This page serves to view the history of receipts or to reprint receipts. For more details can be seen in Figure 10.

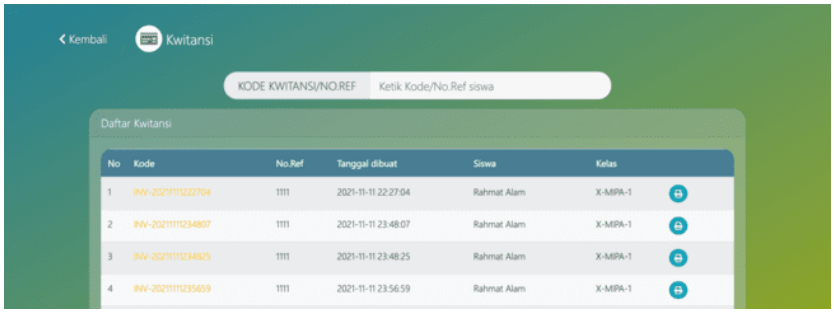

Figure 10. Receipt Page

5. Daily Report Page

This page is a daily report that also comes with the feature of downloading excel files on one page. For more details can be seen in Figure 11.

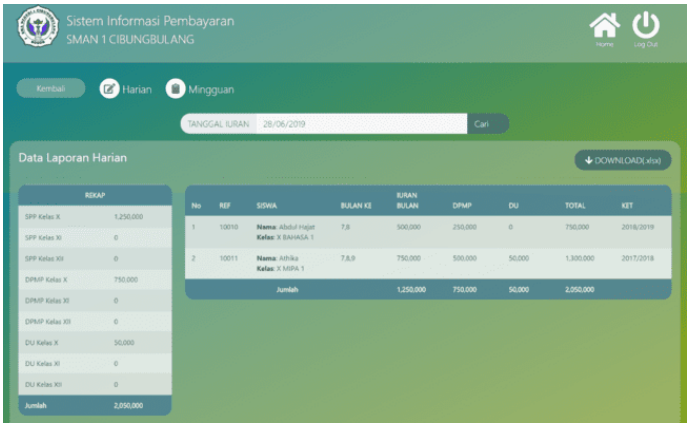

Figure 11. Daily Report Page

6. Weekly Report Page

This page is a weekly report that comes with the feature of downloading excel files on one page. For more details can be seen in Figure 12.

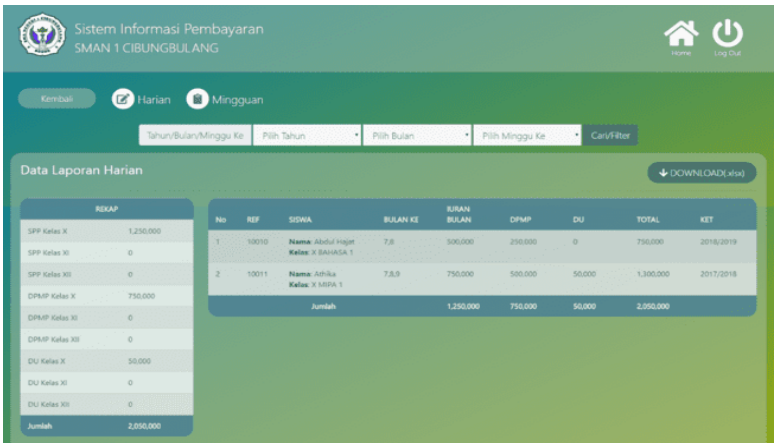

Figure 12. Weekly Report Page

7. Annual Report Page

This page displays dues report data entered for a year with the download feature on one page. More details can be seen in Figure 13.

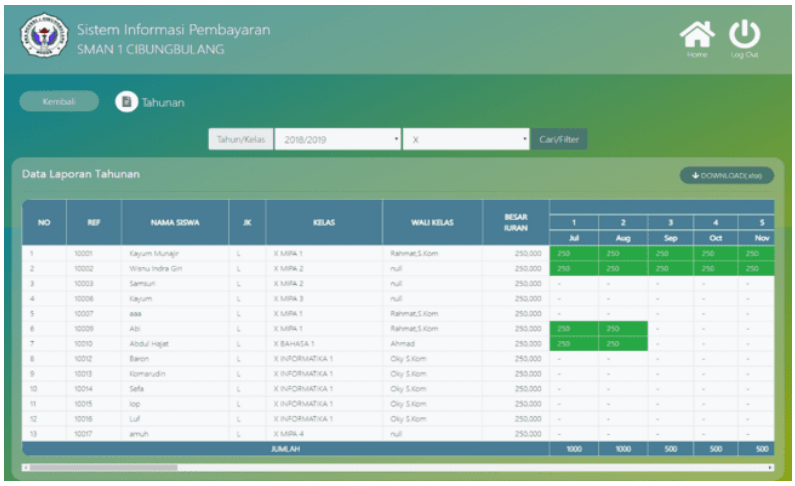

Figure 13. Annual Report Page

8. Download Annual Report Recapitulation

The following is the download of the report recapitulation in excel format. More details can be seen in figure 14.

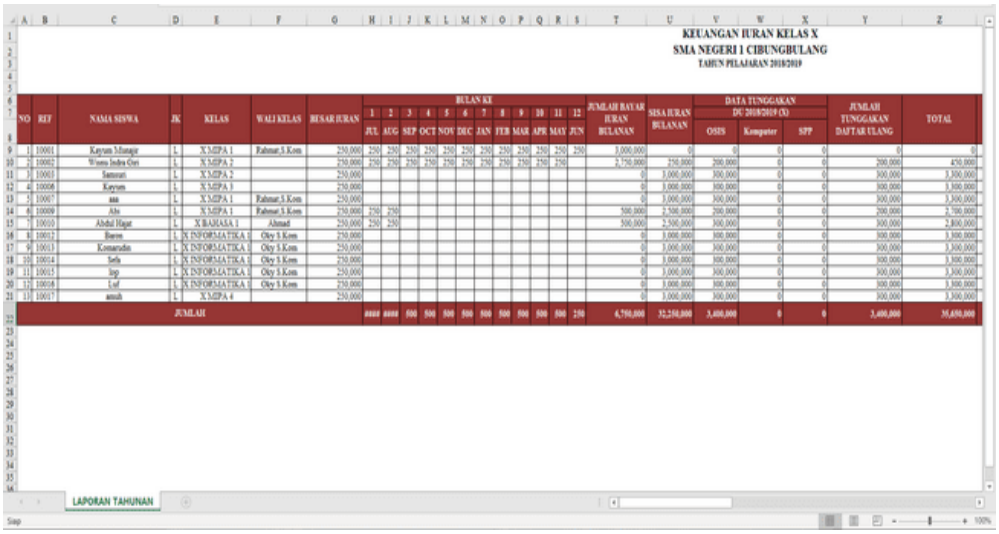

Figure 14. Downloadable Annual Report Recapitulation

3.4 System Test

Table 3.4. Black Box Testing

Test Form	Test Scenarios	Expected results	Test Results
Login	Enter the correct username and password.	Main Page	Valid
	Enter the username and password incorrectly.	Login failed message	Valid
Main Page	Users can access all menus presented	Default after successful login	Valid
User Master	Add a new user account	The data is stored in the database.	Valid
Dues Arrangements	Added contribution usage data: monthly, savings, du, and dpmp.	The data is stored in the database.	Valid

Classrooms	Add class and major data	The data is stored in the database.	Valid
Student	Add student data.	The data is stored in the database.	Valid
	Move student data to a new class	The data is stored in the database.	Valid
	Add student data by using the Import students feature with the excel format provided	Displays a preview of the data.	Valid
	Add student data by using the import student feature with the provided excel format and click the save button.	The data is stored in the database.	Valid
Fee Transactions	Entering dues and savings	The data is stored in the database.	Valid
Print Receipts	Print receipts	Displays a preview of the receipt that is ready to be printed.	Valid
Annual Report	View report data	Displays a preview of data from the database.	Valid
Weekly/Daily Reports	View report data	Displays a preview of data from the database.	Valid

4. Conclusion

The results of the design of the user interface that was built, the system presents a form design that has locked the intended student, and payment input assisted by visual info on the amount of contributions to be paid is thus expected to reduce the margin of error that often occurs, and with the results of the system development carried out, the system has been able to present information on the status of student contribution and savings history so that TU no longer needs to check the status of contribution history or savings previously. When the transaction input is carried out, the recapitulation report will be made automatically. The system has been able to map classes to students more efficiently. The system builder is created an information system that can manage data consisting of student data, class data, monthly contribution data, savings, dpmp, du, and recapitulation reports.

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