Development of a Web-Based School Budget Planning and Revenue Accounting Information System Using Agile Method

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Abstract— Kanisius Foundation Branch Surakarta operates in the education field and covers 38 schools. The school's budget planning and revenue was drawn up at the beginning of the new academic year and reported using the Microsoft Excel application. Some schools have different data formats and structures, which cause data management is not well integrated. Based on these issues, the purpose of this research is to help the Kanisius Foundation Branch Surakarta by developing a School Budget Planning and Revenue Accounting Information System (RKAS), including billing and payment of school fees. This research uses agile methods. The first phase is planning, starting with an overview of RKAS revenue flows, student bills and payment flows. Then compile a Chart of Accounts (COA), create use case and create activity diagrams to design the database design and the basic framework of the program. Then the system is implemented using Laravel, followed by software testing with black box testing. Then the system documentation and deployment. The last stage is maintenance which is performed periodically at a certain time. The School Budget Planning and Revenue Accounting Information System will help Kanisius Foundation Branch Surakarta in management data and make accurate decisions through well-integrated data.

Keywords— agile, revenue, information system, laravel, school.

I. INTRODUCTION

The rapid technological advances of today's globalization truly improve effectiveness, efficiency and greatly facilitate various activities within organizations, especially those related to data management. Technological developments in information systems can help organizations make better or wiser judgments. As a result, the information system designed must be in line with the requirements and objectives of the organization.

A foundation is an entity that carries out business in all kinds of enterprises, whether in non-commercial or indirectly in commercial enterprises [1]. Kanisius Foundation is a non-profit organization that operates in the field of education, where none of its activities are aimed at gaining profit. Kanisius Foundation Branch Surakarta was a branch of the Kanisis Foundation central which covers 38 schools in the region of Surakarta, Boyolali, Karanganyar, Klaten, and Wonogiri starting from playgroup, kindergarten, elementary, junior and high school. The source of income of this nonprofit organization is assistance and donations from the government and other parties.

At the beginning of the new school year, each school is obliged to draw up a School Budget Activity Plan, that contains detailed information on revenue, expenditures, and surpluses or deficits that may occur. The School Budget Activity Plan that should be reported by the schools is still using the Microsoft Excel application. Furthermore, data from some schools also has different data formats and structures, which prevents the data from being properly integrated.

Revenue accounting referred to in this context is related to the billing and payment of school fees for each student, such as Education

Provision Contribution Money fees (USPP), Education Development Donation fees (SPP), computer fees, and activity costs. This allowed each student to have multiple bills in each academic year, resulting in a large amount of data related to school budget and revenue. Then, the student invoices are also related to the invoice on the virtual account, where the import of invoicing data to MRP Bank Mandiri is done by using the Excel format already provided by the Bank Mandiri. This necessity requires an Excel export feature that could automatically match the template, eliminating the need to do it manually one by one.

The number of schools covered generates a large amount of data that the foundation needs to manage. Data management will be easier when using an integrated accounting information system. Website-based accounting information systems can improve the efficiency of management and monitoring of revenue and expenditure of each school, thus allowing more accurate foundation decision-making.

This research aims to develop a well-integrated information system, which requires systems primarily within a company or organization to be able to facilitate budget planning and calculations that may run more precisely, efficiently, and effectively [2]. This website-based system development can use a variety of frameworks, one of them is Laravel.

A website is one of the fast-growing Internet resources that allows graphics or text to be used to link to other web pages [3]. The development of web-based information systems makes it easy for users to access and search for information quickly and accurately as needed. [4]. The implementation of the information system can also be used as a support for any processes in the company, improving the quality of reporting as well as a new step towards changing the system utilized previously [5].

Laravel is a framework that maximizes the use of PHP that has a variety of features that can help developers on developing a website-based application [6]. In addition, Laravel is a PHP framework first developed by Taylor Otwell, released under a MIT license, and built using the Model View Controller concept. (MVC). Laravel is a web development MVP written in PHP that is used to improve software quality by reducing initial development costs as well as maintenance costs [7].

The method used to create this accounting information system is the Agile Method. The Agile Method is a method used to develop software based on common principles or short-term system development that requires rapid adaptation to any form of change. Processes in Agile Methods emphasize fast delivery over each stage of activity to reduce the time period of system development [8].

The development of the information system for the budget plan and revenue accounting includes four modules, namely RKAS income, student bills, student payment, and student data. RKAS is an important matter to be organized in the institution that obtains budget allocation from the government, where the allocation is used as support for the cost of development activities as well as the operation of the institution[9]. Revenue is the increase and decrease of a company's liability that occurs due to the operational activity or the procurement of goods or services for consumers or the general public [10].

Student bills are a right against the parent for the cost of the student's education that has previously been agreed upon for a specified period of time [11]. Student payments are payments on existing bills, where payment is adjusted to the regulations of each school, such as monthly, tri-monthly, or semester. A well-organized and integrated payment system allows student's parents to better track the expanse of school activities [12]. On the student bills will appear a journal of debt on revenue, followed by a bank cash journal on debt for student payment. If there is an overpayment

of the bills when payment is made, then a cash journal of revenue received will emerge. Student data contains relevant information about students in each school with active or inactive student status.

II. METHOD

The Agile Method is a method used to develop software that is adapted to the similarity of principles or development of the system in the short term that requires rapid adjustment from the developer regarding changes in any form [13].
Here are the steps of the agile method:

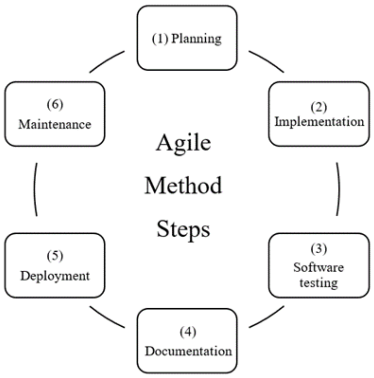

Figure 1. Agile Method

1. Planning

In this phase, the software developer and client will make plans for anything that is required to create the software. The information obtained in this stage is usually the purpose of the software, whoever is going to use it, the general overview of the software, and other information gathered.

2. Implementation

The next step is to implement the plan that has already been made. The programmer will start coding, starting with dividing the work into several parts and then after each part is completed, it will be merged into one unified system.

3. Software Testing

The software that has been created will go through a quality control stage. This is done to determine whether there are bugs in the software that has been developed. If there is a bug, then it must be fixed immediately so that the quality of the software can be restored.

4. Documentation

The documentation stage is the process of documenting the software that has been created. The purpose of this stage is to provide ease in the future maintenance process.

5. Deployment

The deployment stage is the stage in which the software developer is able to guarantee the quality of the completed software by testing the quality, speed and security of the created system. The program software is ready for deployment once the system has been qualified.

6. Maintenance

The maintenance stage is the final step in the software development process. This is done to ensure that there are no problems in the software, therefore regular maintenance should be done on a regular basis.

III. RESULTS AND DISCUSSION

A. Planning

This phase of planning gives an overview of the flow of RKAS revenue, billing flow, and student payments. Then, the new Chart of Account (COA) is structured in accordance with the account code that the Kanisius Foundation Branch Surakarta has been using during this time, designing the database and the basic framework for the program.

1. Use case

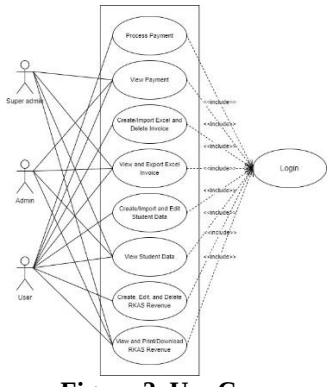

Figure 2. Use Case

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Kanisius Foundation Branch Surakarta has three actors namely Super Admin, Admin and User. User can access all features, while Super Admin and Admin can only access view, export, and print from this system.

2. Activity Diagram

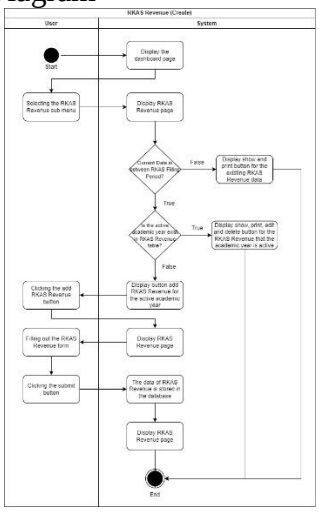

Figure 2. Activity Diagram Create RKAS Revenue

The image above represents the activity diagram for creating RKAS revenue, starting with selecting the revenue RKAS submenu in the dashboard. Then check the period of filling out RKAS and the active school year, select the add data button, and complete the filling. Save by selecting the submit button. Users can show, edit, print, or delete data in the RKAS revenue. Super Admin and Admin can only access show and print.

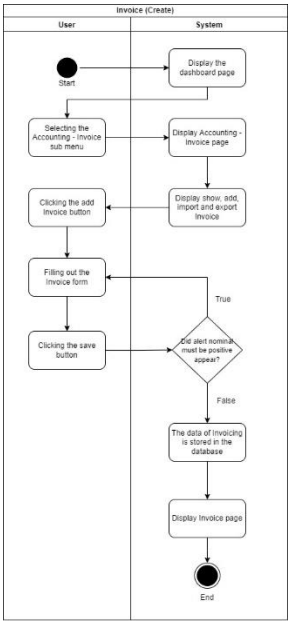

Figure 3. Activity Diagram Create Invoice

The create invoice activity diagram starts by selecting the submenu Accounting - Invoice. Then, select the add data button and fill in the nominal value, which should be positive. Create an invoice by choosing the save button. Users can access add, view, import and export invoices, while Super Admin and Admin can only export and show invoices.

B. Implementation

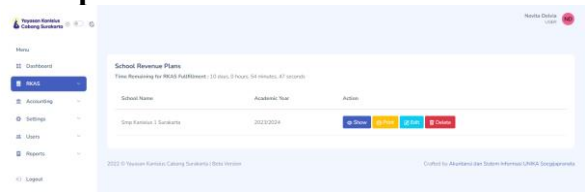

Figure 4. RKAS Revenue page

The above image shows when the User has successfully logged in and added RKAS revenue data. It can be seen when accessing this page, the user can see, print, edit, or delete data.

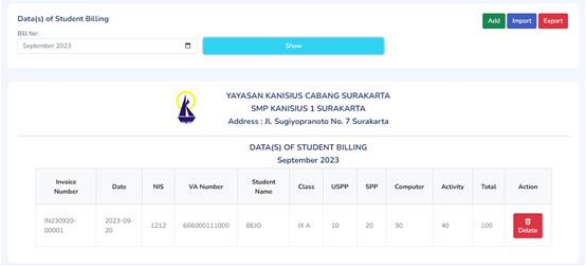

Figure 5. Invoice page

The above image shows when the User has successfully created a student invoice, where the invoicing number appears. In addition, it is also accessible to view invoices according to the desired month, delete bills as long as payment has not been made, import and export Excel.

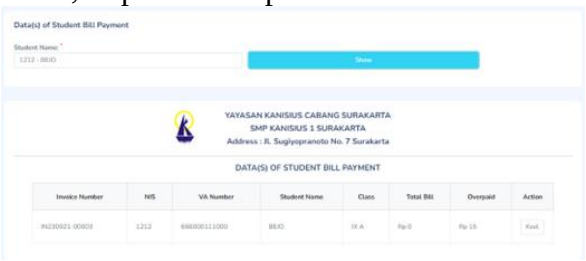

Figure 6. Payment page

The picture above shows when payment has been made and there is an overpayment. The total bill will always be subject to change when payments are made periodically. When a payment is made, the nominal verification of the payment is done

by reopening the invoice page and selecting details. Details contain information related to the payment made.

C. Software Testing

Black box testing is a method of software testing that aims to see whether a developed program is different from a program command without having to know the code of the program that is used [14]. This test is performed and then divided according to its function, whether the value is valid or invalid [15].

1. Black Box Testing RKAS Revenue

The table below is table of testing activity, the expected outcome and conclusion black box testing RKAS Revenue page.

Table 1 Black Box Testing RKAS Revenue

No.	Testing Activity	The Expected Outcome	Conclusion
1.	Click the Add button	Can be click and opened RKAS Revenue form	Valid
2.	Field fully filled	Can save data and redirect to the RKAS Revenue page	Valid
3.	some of the fields is unfilled	Can save data and redirect to the RKAS Revenue page	Valid
4.	Click the Show button	Can be click and can show RKAS Revenue form result	Valid
5.	Click the Print button	Can be click and opened window print RKAS Revenue	Valid
6.	Click the Edit button	Can be click and opened RKAS Revenue edit form with filled data	Valid
7.	Editing Data	System updates data and redirect to the RKAS Revenue page.	Valid
8.	Click the Delete button	System deletes data and redirect to the RKAS Revenue page.	Valid

2. Black Box Testing Invoice

The table below is testing activity table of the expected outcome and conclusion from black box testing Invoice Page.

Table 2 Black Box Testing Invoice

No.	Testing Activity	The Expected Outcome	Conclusion
1.	Click the Add button	Can be click and opened Invoice form	Valid
2.	Fully filled Field and nominal values positive	Can save data and redirect to the Invoice page.	Valid
3.	some of the nominal fields is unfilled	Can save data and redirect to the Invoice page.	Valid
4.	Click the Show button	Can be click and show created Invoice	Valid
5.	Nominal Field values negative	Alert appear and data cannot be saved	Valid
6.	Click the Details button	Can be click and show payment billing history	Valid
7.	Click the Delete button	System deletes data and redirect to the Invoice page.	Valid

D. Documentation and Deployment

Documentation is done on the entire system so that the system maintenance

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process by the Surakarta Branch Kanisius Foundation can be carried out easily. Then, the deployment in which the developer applies the system to the real server, then the system is handed over to the Surakarta Branch Kanisius Foundation.

E. Maintenance

Maintenance of the system is performed periodically at a certain time. The purpose is to identify and fix bugs that appear as a result of updates in the system or in features and the use of functions in the Laravel framework. Maintenance is an activity that should be scheduled by the Surakarta Branch Kanisius Foundation when there is a change in the standard on financial statements that affects the calculation process applied to the system.

IV. CONCLUSION

Based on the authors' research results at the Kanisius Foundation Branch Surakarta, the development of the school budget planning and revenue accounting information system at the Kanisius Foundation Branch Surakarta using agile methods has helped and addressed the problems faced by the Foundation.

1. Kanisius Foundation Branch Surakarta can manage student revenue, bills and payment plan data.
2. Student billing and payment activities became more organized, and billing at MRP Bank Independent became easier.
3. The student billing and filling system has clear details that help the Kanisius Foundation Branch Surakarta make better decisions for the school as well as the parents of students.

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