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Development of Information System to Refute Single Tuition Fee Online (UKT) Case Study : Universitas Pembangunan Nasioanal "Veteran" Yogyakarta

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Abstract

Government education has issued various policies to make education costs cheaper and more affordable for all people, one of which is the UKT (Single Tuition Fee) system, a portion of the Single Tuition Fee that is borne by each student based on their financial ability. The mechanism for determining the Single Tuition Fee group is currently still done manually by UPN "Veteran" Yogyakarta. Single Tuition Fee can be challenged according to the ability of the student's family. A common objection mechanism is filling in some fundamental data such as parents' income, electricity bills, water, motorbike, car taxes, and family economic conditions and interviews. Therefore we need an interactive and responsive Single Tuition Fee rebuttal mechanism for students in particular and UPN "Veteran" Yogyakarta in general.

The Single Tuition Fee system was built on a web basis. This user-friendly designed system will make it easier for students to object to the Single Tuition Fee during the Covid pandemic or after the Covid Pandemic. The methodology used for this research is the waterfall.

The result of this research is a Single Tuition Fee objection system capable of filtering and recapitulating.

Keyword: Single Tuition Fee, Refute, Economic, Covid

I. INTRODUCTION

I.1. Problem Areas

The basis for determining the *Single Tuition Fee* group must accommodate the variables used as parameters for determining the *Single Tuition Fee* group. Changes in the tuition payment system with *Single Tuition Fee* have a positive impact in the burden of payments that previously accumulated at the beginning of lectures into a division in each semester with the addition of cross-subsidies from the size of *Single Tuition Fee*, but in its application, there are still many errors in determining the group of *Single Tuition Fee* groups due to human error. Accuracy of *Single Tuition Fee* classification and transparency of calculations to assess *Single Tuition Fee* groups is a must to prevent abuse of authority and increase the trust of parents/guardians and students to the university.

The *Single Tuition Fee* classification system is required to be able to follow changes in the basic factors determining the *Single Tuition Fee* class according to university policy. This determination system can provide a classification decision using the data distribution method as a search for the upper and lower limits of several criteria that strongly support the determination of the *Single Tuition Fee* group. The data range used shows how far the data is spread from the average obtained from all data. The results of this data range produce an upper and lower limit with the search for the frequency distribution then the *Single Tuition Fee* group calculation process, where the results obtained will be better than the previous results.

The objects used in determining *Single Tuition Fee* are some parents' income, bills, and so on. Along the way, many students objected to the amount of *Single Tuition Fee* set at the time of becoming a student. The impact is that the refutation of *Single Tuition Fee* is the best solution. The objection activities of *Single Tuition Fee* that have occurred so far are that students come alone or together with supporting documents that can be used as evidence and material for consideration of the reduction of *Single Tuition Fee*. According to the results of observations in the process, there were many obstacles faced by students, such as distance and time, so that the objection of *Single Tuition Fee* was nevertheless carried out. The determinants of *Single Tuition Fee* are the income of parents/guardians, land and building tax (PBB) bills, electricity bills, water bills, telephone bills, vehicle taxes, and family economic conditions. Determination of the *Single Tuition Fee* group using a system built will produce a more confident and accurate output. The development of this system is expected to cut the *Single Tuition Fee* rebuttal mechanism so that the implementation process is more interactive and responsive. This system will later be integrated with the Central Financial Information System, which is being developed by UPN "Veteran" Yogyakarta.

I.2. Problem Statement

Based on the background described above, it can be formulated to refute the *Single Tuition Fee* for new students according to the ability of the student's parents or guardians.

I.3. Research Limitation

In the preparation and manufacture of this application, there are limitations, including:
1. This application was built to refute *Single Tuition Fee, new students,* for the 2020 academic year.
2. The data used are the main components of the *Single Tuition Fee*, which applies to other students.

I.4. Research purposes

The purpose of this research is to make an application that can help more efficiently refute *the Single Tuition Fee* for new students.

I.5. Benefits of Research

The main benefit from this research is expected to make it easier in determining the refute tuition fee group decisions and can overcome errors in determining *Single Tuition Fee*, as well as time efficiency in determining the refute tuition fee group.

II. LITERATURE REVIEW

Previous research that has conducted similar research include:

Table 1. Previous Research

No	Title	Purpose	State of the art
1.	Single Tuition Fee Decision Making Model at State Universities (Case Study: Nineteenth November University, Kolaka) Author: Ilham Tahir, 2016	This research aims to build a simulation model of decision making to determine a Single Tuition Fee for new students at the University of Sembilanbelas November Kolaka	1. The research method used is the Simple Additive Weighting (SAW) method. 2. Single Tuition Fee is divided into three groups. 3. The variables used include family condition, education of parents/guardians, age of parents/guardians, number of children, the income of parents/guardians, and total assets of parents. 4. All fixed assessment indexes.
2	Determination of the Amount of Single Tuition for New Students at Sam Ratulangi University Using Data Mining Author: Budianto Karim, 2017	The purpose of this study was to facilitate the determination of Single Tuition Fee and shorten the time for categorizing Single Tuition Fee	1. There are eight parameters used in the C4.5 algorithm 2. The method used is a decision tree 3. Data storage using data mining
3	Application for determining the payment of single tuition fees for the 2015/2016 academic year at the UPN "veteran" Yogyakarta Researcher: Chandra Ade Yudawan, 2017	The purpose of this research is to make an application to determine the single tuition fees group	The only variable used is the salary of the parents and cannot refute a tuition fee.

The difference between this paper and previous research lies in the refute of single tuition fees, variable input data, system transparency, and business process flow from refusing online tuition fees.

III. RESEARCH METHODOLOGY

In this paper, software development methodology using the waterfall methodology. Waterfall allows the resulting application to go through several stages of optimal requirements.

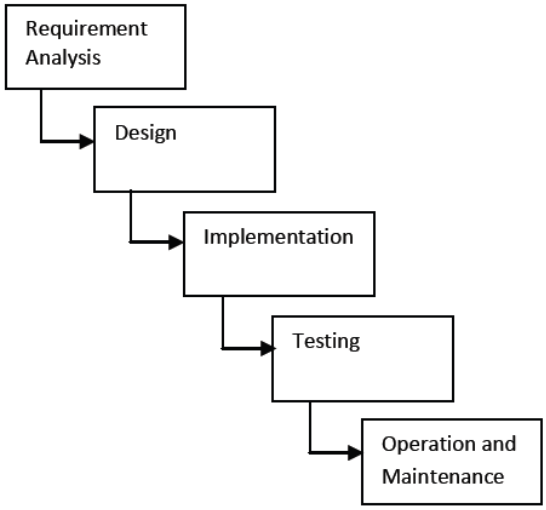

Figure 1. Waterfall Methodology

III.1. Problem Analysis
In analyzing the problem is done gradually. These stages include literature study, observation, and interviews. Problem analysis is done by looking for single tuition fees data in the form of factors used to determine the single tuition fees group, doing manual calculations with Microsoft Excel.

III.2. Observation
Observation is the process of collecting data through direct observation or careful and direct observation in the field or research location that will be the object of research. This study conducted observations at the Yogyakarta "Veteran" National Development University, specifically for new students (objection).

III.3. Interview
This method is carried out for resource persons who know the financial section of UPN "Veteran" Yogyakarta and some students who have used the single tuition fees system. This interview with resource persons aims to gather relevant data information about the existing process. The data that has been obtained will be used as a parameter for making the system to be built to suit future developments. This interview got information in the form of a single tuition fee flow system when submitting the required documents.

III.4. Data Flow Diagram (DFD)
DFD level 0 is a general description of the system process to be built. DFD level 0 has three entities, namely the admin entity, the student entity, and the operator entity, and there is one process, namely the single tuition case study application at the UPN "Veteran" Yogyakarta.

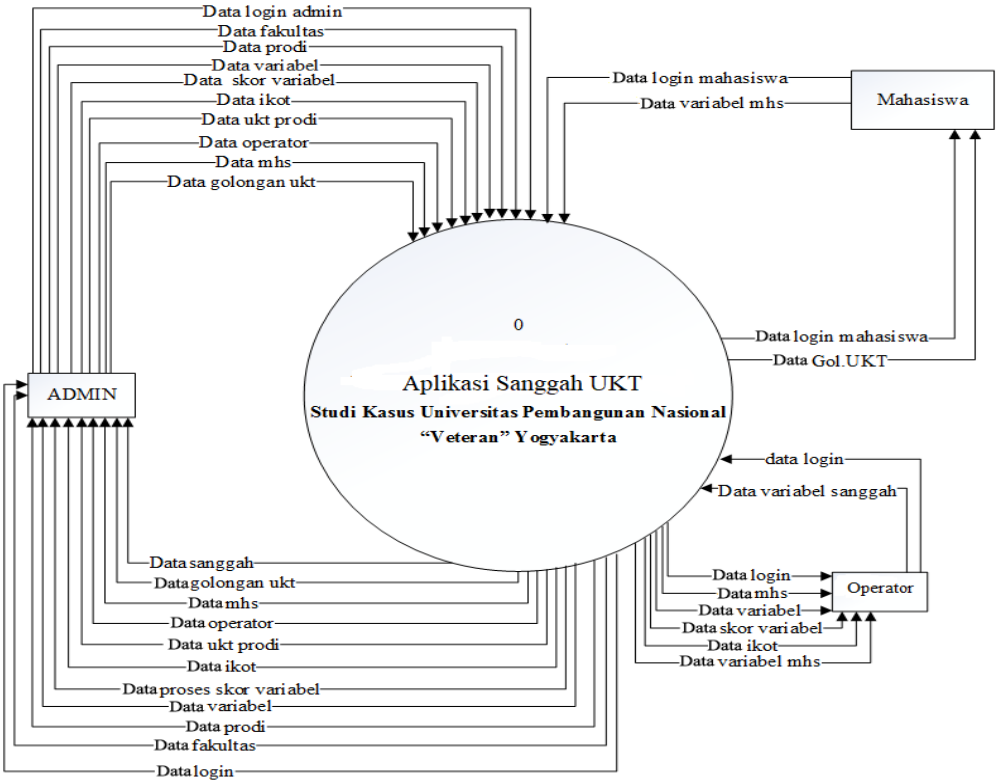

Figure 2. DFD for Refute Tuition Fee

III. 5. Flowchart Refute Tuition Fee

The flowchart is a general workflow from the stages in the tuition fee refute application. The flow chart of the single tuition fee application starts from data input consisting of steps, electricity tax, water tax, family dependents. The correctness of the data by the committee is validated with evidence/files. If the file is valid, then the single tuition fee application process can be understood. From the calculation of the new single tuition fee, there are two possibilities, namely a decreased single tuition fee or a fixed single tuition fee. The next stage is to pay a single tuition fee the new amount that has been determined through a refutation process. Students who have paid will get a Student Identification Number as official proof of identity to enter a university. A flowchart of a single tuition fee can be shown in figure 3.

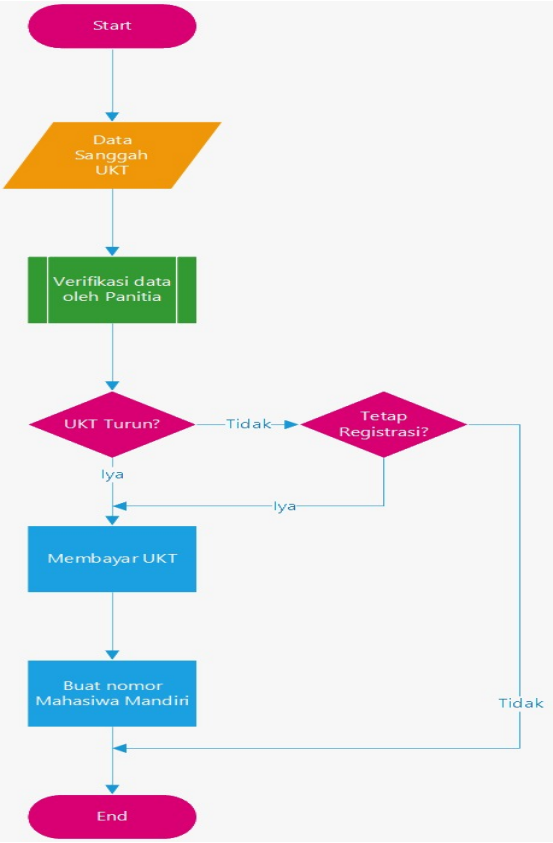

Figure 3. Flowchart Refute Tuition Fee

III.6. System Architecture

The Tuition Fee objection application on UPN "Veteran" Yogyakarta was built to input student variable data, requirements files, and process for the Tuition Fee objection by operator and admin students. In the following architecture, there is the involvement of the server as a service provider and the client as a user requesting service.

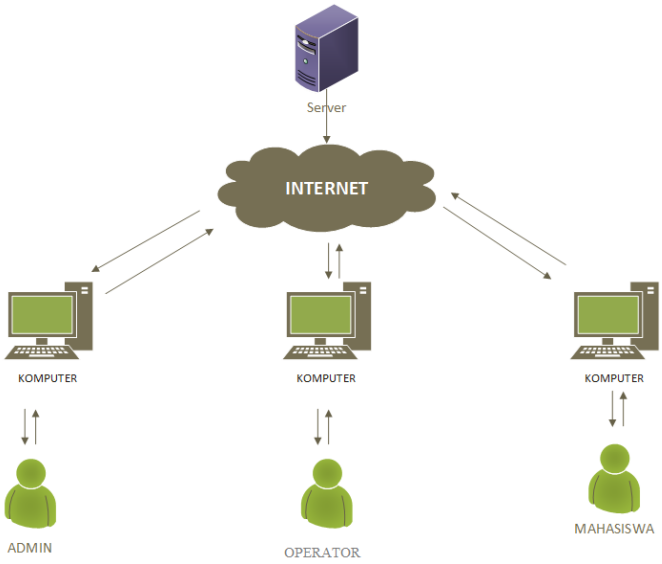

Figure 4. Architecture

IV. FINDING AND DISCUSSION

The implementation of the Single Tuition Fee objection application has been successfully carried out at UPN "Veteran" Yogyakarta and is currently running well. Students can log in using their respective accounts. In the dashboard menu, it is presented in Figure 4. On this login page, students enter the student account and password that have been registered first so they can enter the Single Tuition Fee objection application.

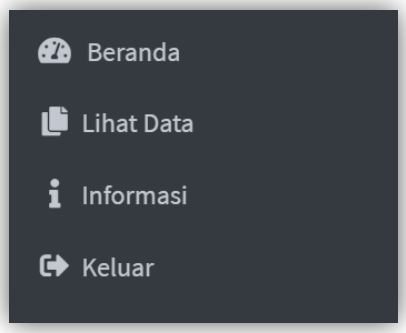

Figure 5. Dashboard Display

There are three main menus presented by this application, the homepage, see data, and information. Students who have logged in can see the current Single Tuition Fee amount. Student data displays student data who have successfully logged in, containing the student's data, study program, class, and a number of Single Tuition Fee. The homepage includes a welcome greeting. Students can see detailed current Single Tuition Fee data, as shown in Figure 6.

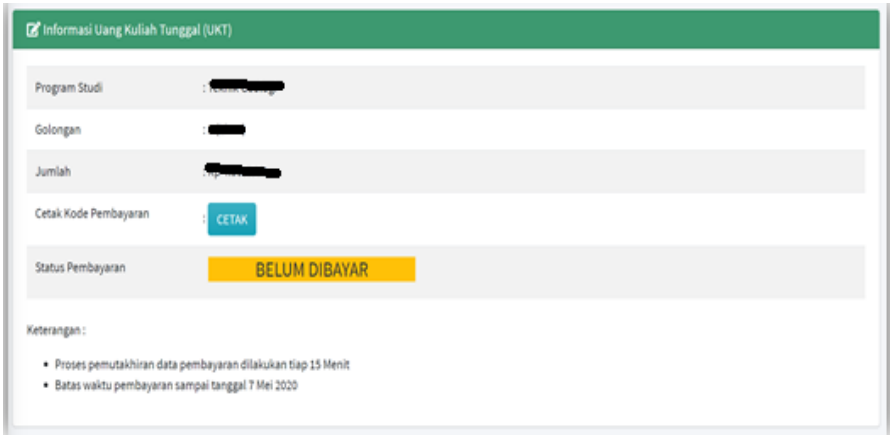

Figure 6. Single tuition fee information display

The picture above is a detailed display of information from the student side who will object to Refute Tuition Fee. This Refute Tuition Fee rebuttal applies to new students. The information available in the study program, the current group, and the number of Refute Tuition Fees. The next menu is the information menu. In this menu, there is the main menu of the Refute Tuition Fee objection application, namely the process of submitting a refutation, as shown in Figure 7.

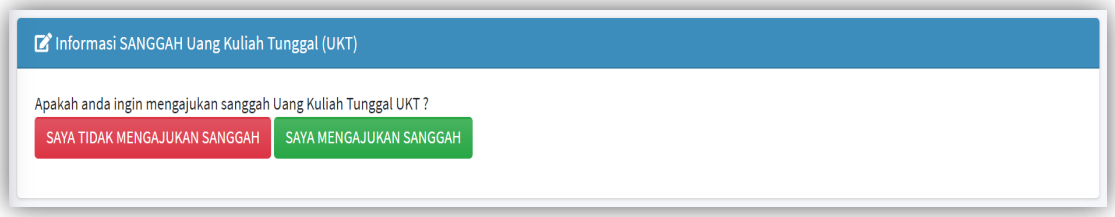

Figure 7. Form Refute Tuition Fee

After the user selects the button, I submit an objection, and then some data must be filled in first. These data, such as parents' income, followed by electricity bills, water bills, vehicle taxes, and the family economy. In the form below, the data that must be filled in include, among others, the income data of the two parents/guardians. The application form for parent income data can be seen in Figure 8.

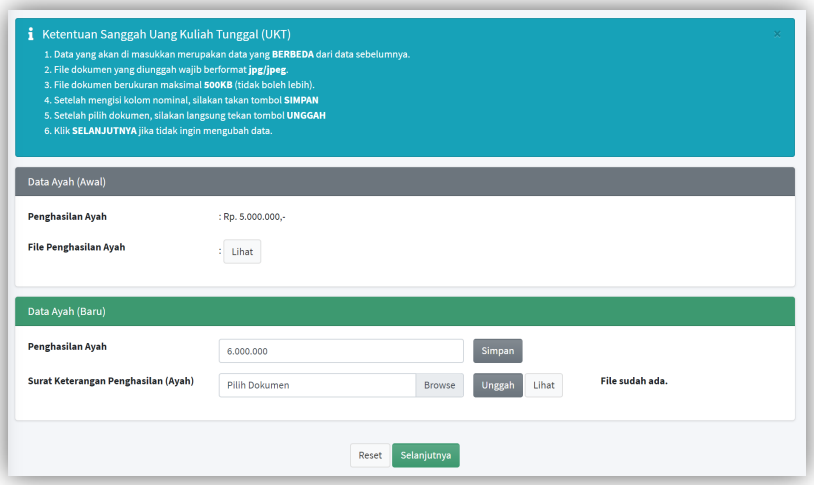

Figure 8. Data Parents Stage

The next stage is to fill in information related to electricity bills. Electricity bills are one of the requirements for filing a refute tuition fee objection because there is a relationship between the ability of parents and their monthly electricity bills. The electricity bill form can be seen in the following Figure 9.

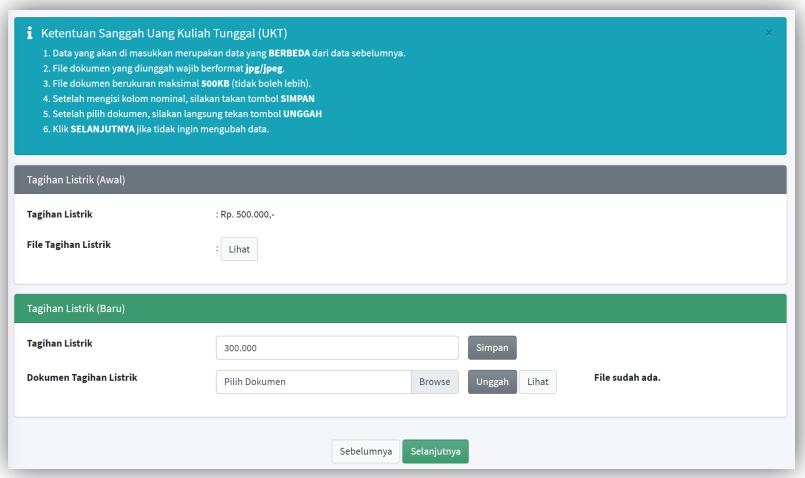

Figure 9. Electricity data filling stage

The next stage is to fill in information related to water bills. The water bill is also one of the requirements for filing a refute tuition fee objection. The water bill form can be seen in Figure 10 below.

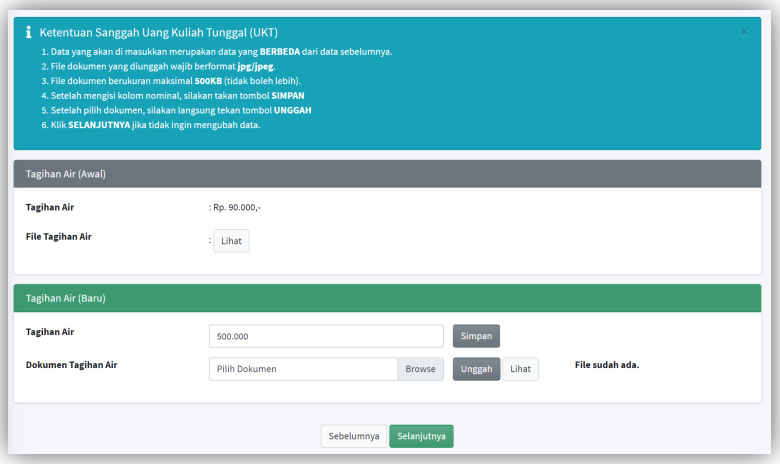

Figure 10. Water data filling stage

The next stage is to fill in information related to vehicle ownership proven by motor vehicle tax. Owning a motorized vehicle is one of the parameters that a person is categorized as being able to pay for college or being less able to pay for college. The vehicle tax form can be seen in Figure 11 below.

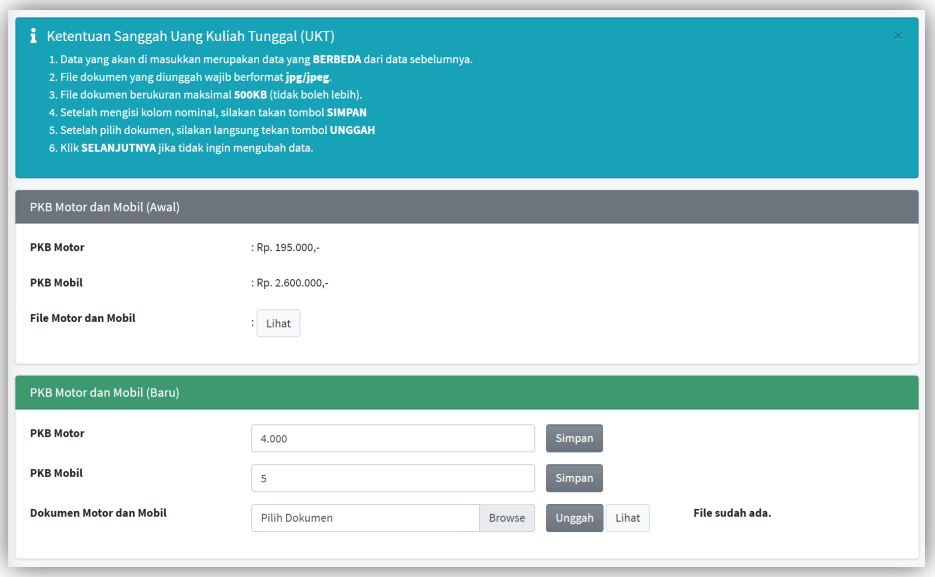

Figure 11. Motorcycle & Car Tax Stage

The final stage is to fill in information related to the number of dependents in the family. Filling in the form for dependents can be described in a brief descriptive manner. All the steps above must be filled in correctly and honestly. The form of family dependents can be seen in Figure 12 below.

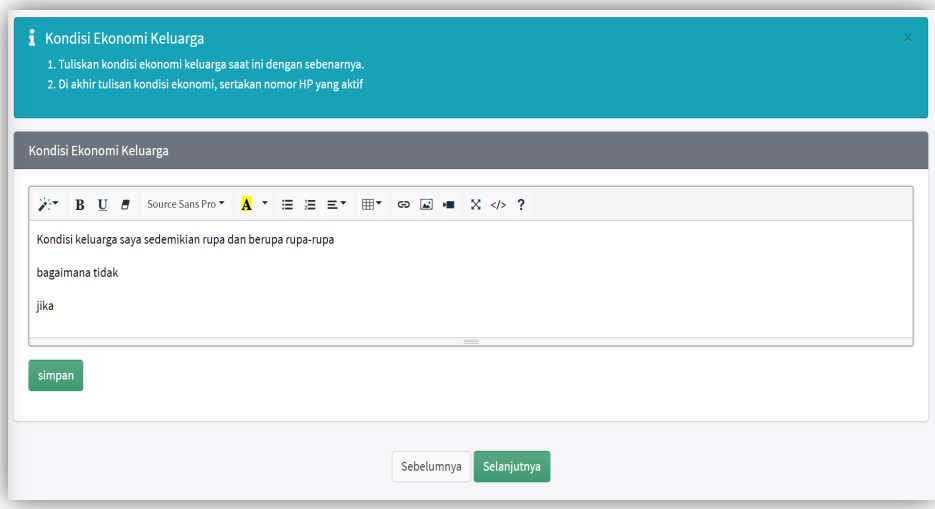

Figure 12. The stage of family economic condition

As a closing process for the refutes tuition rebuttal process, it ends with a statement that the data will be locked, which means that the data cannot be changed again. All data that has been filled in must be based on truth and honesty and be supported by variable files.

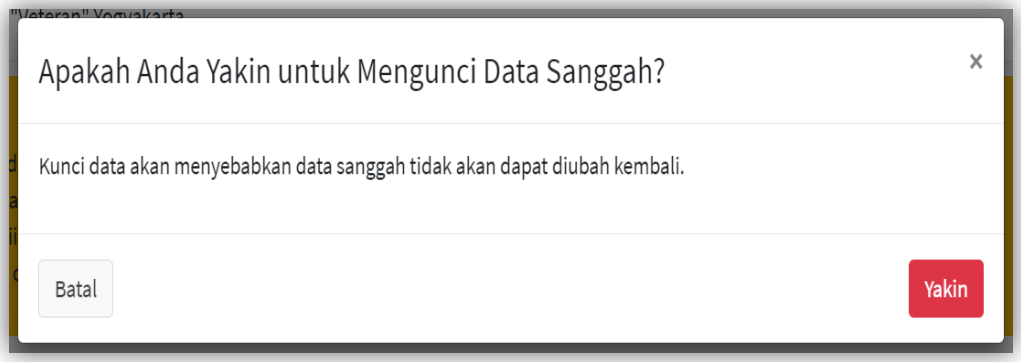

Figure 13. Stages of data lock

IV.1.Testing Result

Testing this application is functional. This test is the final stage of application design. This test is conducted to determine the extent to which the program can be used optimally. The results of the alpha test are 80%, and the beta test is 84%, so that in terms of usage, this application can be accepted by users.

V. CONCLUSION AND FURTHER RESEARCH

From the previous discussion, it can be concluded that the application for objection to the single tuition fee of UPN "Veteran" Yogyakarta has been successfully designed and built into a web-based

application. This application is also a solution that can be used during the Covid pandemic, where there is no way to object to a single tuition fee manually. This application is online and has access rights, which are divided into three types. This application can provide time efficiency in determining the upper and lower limits of income variables, land and building taxes, electricity bills, water bills, and telephone bills using the data distribution method. Based on the results of testing the application functionally, this application can be used by users.

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