Credit Transfer System (CTS) Design in Academic Information System of Diponegoro University

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Abstract - *One of the information system built in Diponegoro University is Academic Information System. This system manages every process and outcome of academic activities. Academic information system is developed to meet the needs of process and academic data that is also always growing. One of growing academic process is the implementation of Credit Transfer System (CTS). Credit Transfer System is an academic process whereby every Diponegoro University student can attend lectures in subjects that are interested without being tied to courses and curriculum. The realization is that every student can take a course or KRS interest in any study program in Undip. With the implementation of the CTS, the Academic Information System should be developed by adding new features to adopt the system. The application of CTS in academic information systems is done by adding a group of menus to the academic information system, offering CTS courses, creating a CTS lecture schedule, looking at college schedules, viewing and printing present CTS lectures, creating UTS and UAS schedules, printing UTS and UAS attendance lists, as well as the final semester value filling menu. Also added data synchronization menu and change the logic of charging KRS in SIA.*

Keywords *– information system, CTS, PHP, MYSQL*

1. Introduction

Information system is a set of components that interconnect, collect, process, store, and distribute information to support decision making and supervision within an organization[1,2,3]. Today the information system can not be separated with computer technology that feels growing rapidly along with our increasingly complex needs. These developments can be seen from the many organizations or institutions in various fields that use computerized systems to perform various jobs quickly and with great accuracy. The use of computerized systems is expected to minimize errors made by humans thereby reducing large losses. And can increase time efficiency in completing the work quickly and accurately.

One of the information system built in Diponegoro University is Academic Information System. The system manages every process and outcome of academic activities. Academic information systems are developed to meet the needs of academic processes and data that are also evolving. One of the growing academic process is the implementation of Credit Transfer System (CTS).

Credit Transfer System is an academic process whereby every Diponegoro University student can attend lectures in subjects that are interested without being tied to courses and curriculum[4]. The realization, every student can take a course or KRS interest in any study program at Diponegoro University.

With the implementation of the CTS, the Academic Information System should be developed by adding new features to adopt the system.

2. Software Architecture Design

Software architecture design is used to provide an overview of the application process to be created as well as the components associated with the application[5]. The process begins by offering which courses will be included in the CTS program. Next step is create a schedule for the course. The next step is synchronize between CTS system

information academic system on department. Mapping course subjects where CTS is implemented with courses on department that follow CTS and import schedule data of the course is done at synchronization. Then students do charging KRS. The next process is same as usual, such as: print attendance list, create UTS schedule, create UAS schedule, print attendance list of UTS and UAS, and filling grade of the course. Figure 1 and 2 show the flowchart of that process.

2. Database Design

In an application, database is useful for managing the existence of data required by the application. Settings include storage, alteration, deletion and data access settings by user[6]. The data is stored in tables that have been set.
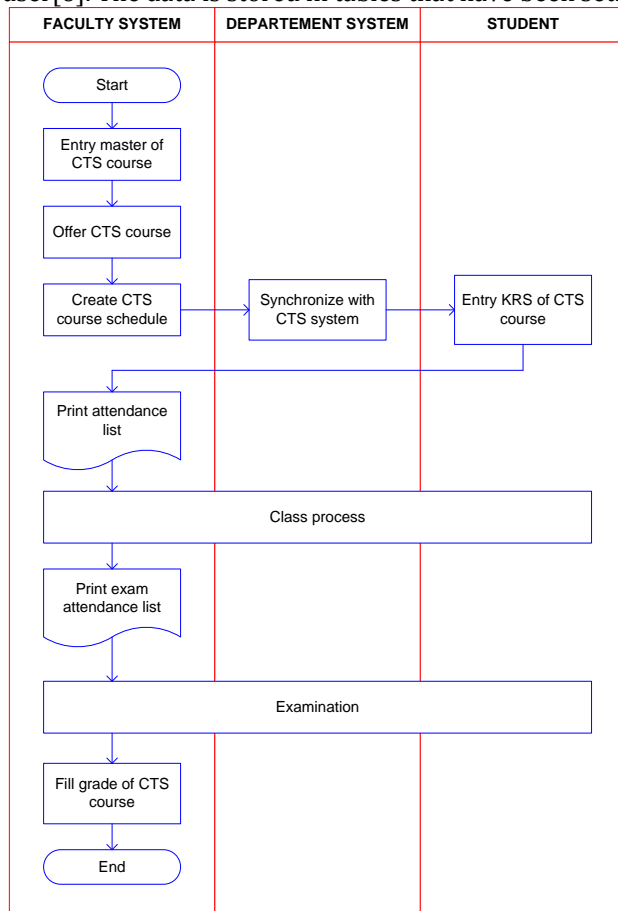

Figure 1. Flowchart of Faculty CTS System

Adding CTS feature in academic information system change the structure of existing mk table by adding 3 fields, namely aktifCTS, CTS and asalCTS.

aktifCTS field is used to determine which course included in CTS system. If the value of this column is Y, it means the course is included in CTS system and can be taken by student in any department at Diponegoro University. Field CTS is used for mapping courses in department with other department and courses that CTS system managed by the faculty. The asalCTS field is used for the identification of the department where the course

provided in the CTS field is derived. If the course comes from the department, it is filled with department code, but if the course is managed by faculty then this filed is filled with faculty name.
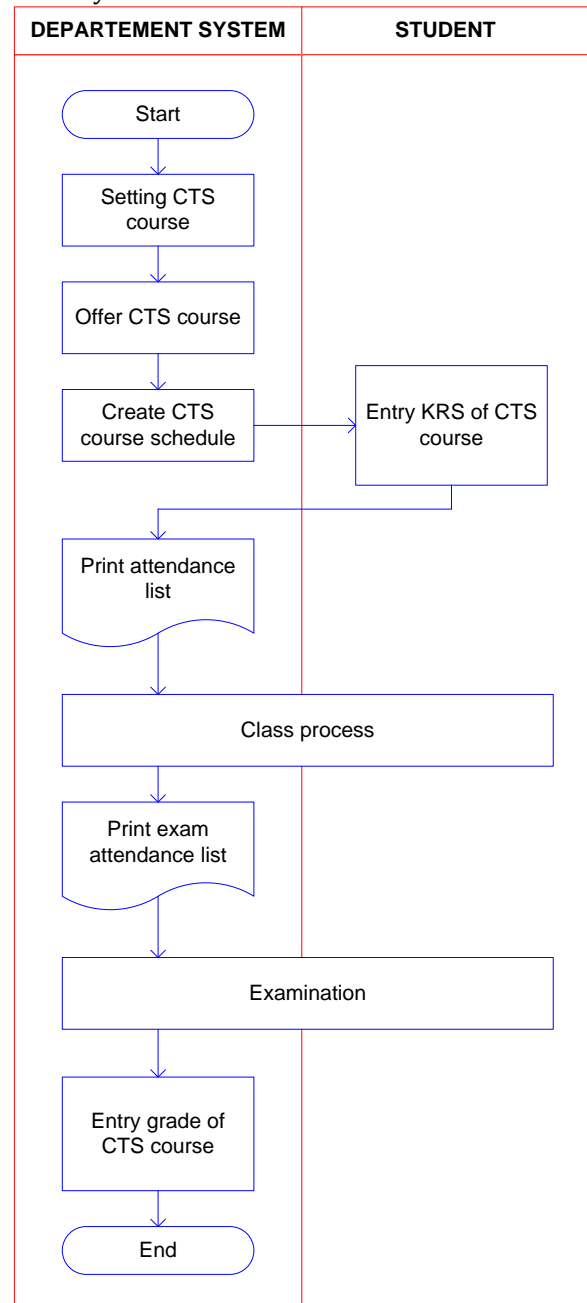

Figure 2. Flowchart of department CTS system

3. Implementation
3.1. Offer CTS Course Menu

The CTS course offer menu is used to determine the selected course that covered in CTS program. By participating in CTS program, relevant courses will appear on the KRS filling menu in all department. While the courses not covered in CTS program only appear in itself department.

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The design begins with design of the interface, which will provide an overview of the application page that will be created[7]. The design of offer CTS course menu interfaces is shown in figure 3.

Figure 3. Interface design of offer CTS course menu

The page will appear when the offer CTS course menu selected. On the left side of the page is displayed a list of subjects that are stored in the master course that is still active status. The right side will show the active selection of CTS for each course. If the selected option Y, then the relevant courses are included in the CTS program and if the value of T, then the course is not included in the CTS program.

3.2. Create CTS Course Schedule Menu

This menu is used to entry the CTS course schedule. In this case the schedule-making process is done outside the system and after the schedule has been established, the schedule will into the academic information system. The design of the scheduling menu interface is shown in Figure 4.

Figure 4. Interface design of CTS course schedule menu

3.3. Create CTS Course Schedule Menu

Synchronization menu is used to mapping the course and import data from Faculty system to department system. Mapping course is use to provide an identity to which course on department are linked to the CTS course in Faculty. This is done by adding the CTS course code to the course in department. Synchronization process also use to import the data of CTS course schedule, so that the students in department can see the course schedules that participate in the CTS program. Interface design of CTS course sync menu can be seen in Figure 5.

Figure 5. Interface design of CTS course sync menu

3.4 Display and Print Attendance List Menu

This menu is used to view the list of CTS participants for each course. In order to be displayed in the list, students must complete KRS first. KRS filling is done on SIA system of each student's department. After charging KRS, the student must request the approval of the guardian lecturer for KRS that has the student fill it. After that student can appear in the list of participants. The design of the interface for display and print attendance list menu is presented in Figure 6.

The first step is to select the course that will display the list of participants. A list of courses to choose from is the course that has been taken by the students and kept in KRS. After the selection of the course is done, the next will be shown a list of participants for the selected course lectures.

Figure 6. Interface design of display and print attendance list menu

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3.5 Entry The Final Grade Menu

This menu is used to fill the final grade for the selected course. The interface design for the filling menu is shown in Figure 7.

At the top of the page is displayed the choice of academic year, name of the course and method to be used. After that will be displayed a list of participants for the selected course. On the right of each student's name there is an option to fill out the student's grade. The grade will be saved when the save button is pressed.

Academic year, course, class	
Exam attendance list	Grade entry form

Figure 7. Interface design of entry final grade menu

4. Conclusions

Conclusions for this research is :

1. Implementation of CTS system accommodated by academic information system by changing logic and adding new menu both in academic information system of study program and academic information system of faculty.

2. In the academic information system faculty added new menu groups for the purposes of implementing the CTS system, offering CTS courses, creating CTS lecture schedules, viewing lecture schedules, viewing and printing present CTS lectures, creating UTS and UAS schedules, printing UTS attendance lists and UAS, as well as the final semester value filling menu.

3. In the academic information system of the study program, the application of CTS is done by adding synchronization menu to synchronize data between SIA system and logic changes in KRS filling process, where KRS data will be stored in SIA study program and faculty SIA.

4. For the purposes of application of CTS system, change the structure of the table in the database used. Table that changed its structure is mk table that is by adding 3 pieces of column that is aktifCTS, CTS and originCTS.

5. The entire system built and added to the SIA system works well. This can be seen with the obtained outputan application in accordance with the desired.

5. Acknowledgment

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