DESIGNING A WEBSITE-BASED REGISTRATION AND STUDENT SCORE INFORMATION SYSTEM AT PT INTERNATIONAL EDUCATION CENTER.

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Abstract

Educational institutions function as a place to carry out the teaching - learning process, training, and development of their students. In this era of globalization, educational institutions are expected to adapt in information systems to support academic activities such as processing value data or in presenting academic information quickly, precisely, accurately and with quality. The application used for data storage and processing at this time is Ms Excel, without a database and not yet integrated. Consequently, there are many obstacles faced by the academic administrative matters such as processing student data, searching for documents or student files which take long time. The design of this information system is the waterfall method, with object-oriented system design analysis using the unified modelling language (UML) method. By using the UML method, the diagrams design are Use Case Diagrams, Class Diagrams, Activity Diagrams, State Chart Diagrams, Sequence Diagrams, Collaboration Diagrams, Component Diagrams and Deployment Diagrams.

Keyword: Information System, waterfall method, unified modelling language (UML).

Introduction

The development of information technology makes it easier for us to process data optimally for our interests and the interests of organizations or agencies. To be able to carry out computerized data processing, we need an information system capable of processing data automatically and quickly, which will have a significant impact on the progress and development of the organization or the agency itself. The variety of organizations or agencies and their types referred to include, for example, educational institutions, government or private agencies, trading or service companies. These entities are computerized to help streamline activities and data processing in their daily operations.

Identified problems related to the academic information systems at IEDUC are as follows:

1. The input of registration and grade data still relies on Microsoft Excel, resulting in lengthy and inefficient data processing and retrieval processes.
2. Retrieving student data and grades often leads to inaccuracies and consumes a significant amount of time.
3. The current system lacks a robust database, leading to inconsistent data and an inability to validate data duplication, consequently resulting in frequent data redundancy.
4. There is a shortage of alternative media for presenting information, which hampers efficient access to information.
5. Manual execution of various stages is becoming increasingly impractical, underscoring the necessity to develop a comprehensive registration information system and student scoring system at PT. International Education Centre.

The insights and troubleshooting plans are as follows: The data to be processed consist of student information and grade data. The student score data to be processed includes initial grades, mid-term grades, and final grades of the classes attended by the students. The features encompassed in the design of this information system are limited to student registration and grade management.

The information system development employs the Waterfall method, comprising the following stages: system requirements, software requirements specifications, software design, software implementation, software integration testing, operation, and maintenance. The objectives of this research are:

1. To understand the existing registration system and student grading process at PT. International Education Centre.
2. To identify the challenges encountered in the current registration system and student grading process at PT. International Education Centre.
3. To explore the efforts undertaken to streamline the processing of registration data and student scores at PT. International Education Centre.
4. To outline the design of the registration information system and student grading process at PT. International Education Centre.
5. To investigate the implementation of the registration information system and student grading process at PT. International Education Centre.

Literarute Review

Educational assessment refers to the process of collecting and analyzing information to determine students' achievement in learning outcomes. In accordance with PP Number 19 of 2005 regarding National Education Standards, educational assessment at the primary and secondary education levels encompasses:

a) Assessment of learning outcomes by educators.
b) Assessment of learning outcomes by educational units.
c) Assessment of learning outcomes by the Government.

Apart from engaging in planning and facilitating the learning process, each educational unit also evaluates learning outcomes as part of the endeavour to implement effective and efficient teaching practices.

Definition of System According to Murdick, R.G, (1991) "A system is a set of elements that form a collection or procedures/processing charts that seek a common goal or goal by operating data and/or goods at a certain reference time to produce information. and/or energy and/or goods."

Jogiyanto (2005) asserts that a system possesses specific characteristics or attributes, namely: interacting components, signifying that they collaborate to form a unified whole. The system boundary represents the area that demarcates one system from another system or from its external environment. The external environment of a system encompasses anything beyond the system boundary that influences its operations. Interface serves as a medium connecting one subsystem to another subsystem. System input is the energy inputted into the system. Inputs can take the form of maintenance inputs and signal inputs. System output is the result of processed energy, classified into useful outputs and waste disposal. A system can have a processing component that transforms inputs into outputs and fulfills system objectives. Therefore, we can determine the inputs required by the system and the outputs that the system will generate; the system can be considered successful if it attains its objectives or goals.

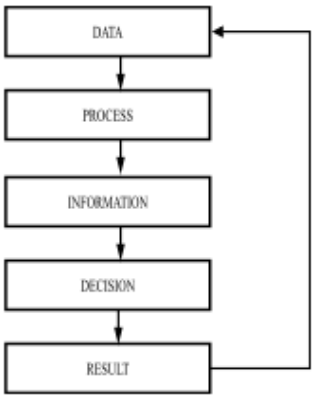


Figure 1. Information Cycle

Methodology

The research design utilizes the Unified Modeling Language (UML), which is a set of conventional modeling conventions used to define or depict a software system in relation to objects (Whitten, 2004). UML can also be understood as a standard graphical language employed for modeling object-oriented software. The following diagrams are used in system design using UML:

The use case diagram portrays the expected functionality of a system, emphasizing "what" the system does rather than "how." A use case represents an interaction between an actor and the system. The class diagram is a specification that, when instantiated, produces an object and forms the core of object-oriented development and design. A class depicts the state (attributes/properties) of a system and also offers services to manipulate that state (methods/functions).

The activity diagram illustrates various activity flows within the designed system, showcasing how each flow starts, possible decisions, and how they conclude. The state chart diagram illustrates transitions and changes of state (from one state to another) of an object in the system due to received stimuli.

The sequence diagram graphically illustrates how objects interact with each other through message execution within a use case or operation. The collaboration diagram also depicts interactions between objects like a sequence diagram, but it emphasizes the roles of individual objects rather than the timing of message delivery. Each message has a sequence number, where messages from the highest level are numbered one. Messages from the same level share the same prefix.

The component diagram illustrates the structure and relationships among software components, including dependencies between them. Modules contain code, whether source code or binary code, libraries, or executables. These can appear during compile time, link time, or run time. The deployment diagram is similar to the class diagram, but instead of depicting class objects, it's more appropriate to use an object diagram that models actual object instances, indicating the current attribute values of the instances.

Data collection methods are carried out through field studies. Interview is a data collection method involving asking questions to respondents, typically through face-to-face conversations (Prabowo: 1996). Observation: According to Nawawi & Martini (1991), observation entails systematic observation and recording of elements visible in a phenomenon or within research objects. Literature Review is one of the data collection techniques employed by the author, involving reading, studying, and analyzing various reference books and reading materials related to the research title, or utilizing internet resources related to student registration and grades.

Software Development Technique

The information system development method employed is the waterfall model. This model provides systematic and sequential approaches for software development. This development model is linear, starting from the initial stage of system planning to the final stage of system maintenance. Subsequent stages will not be executed until the preceding stages are completed, and it is not possible to revert or return to a previous stage.

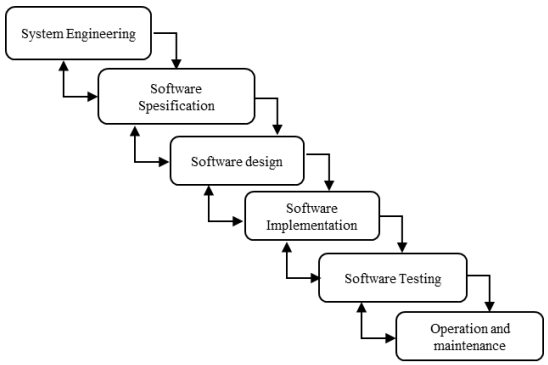


Figure 2. *Waterfall* Model *Abdul Kadir (2002)*

Result and discussion

A. Analysis of the Current System

1. Description of the Current Procedures

The description of the current online student registration and grading procedures at IEDUC is as follows:

a. Students fill out the registration form.
b. Students submit the completed registration form corresponding to the selected program to the administrative staff.
c. Administrative staff create class data based on the course program and instructors.
d. Students and instructors conduct the course program.
e. Students and instructors undertake the course program examination.
f. Instructors assess the results of the course program examination and submit them to the administrative staff.
g. Administrative staff verify the course program's examination results.
h. Administrative staff compile the examination results to create the course program's grade report.
i. Administrative staff print the course program's grade report and hand it over to the operational manager.
j. Administrative staff publish/announce the course results for each class in the form of grade data through direct announcements.

2. Use Case Diagram of the Operational System

Based on the description of the current procedures, a use case diagram for the running registration and grading system at IEDUC can be created in Figure 3.

3. Activity Diagram of the Running System

Activity diagram describes the activities that exist within a system.

B. System Planning

1. Functional Design

Functional design is an overview, design and manufacture of schemes or arrangements of several separate elements into a unified whole and has a function and purpose.

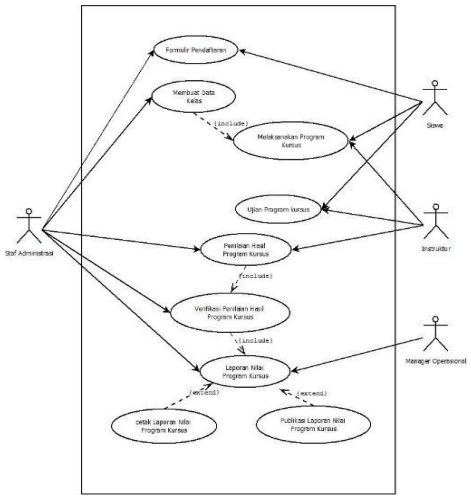


Figure 3. *Use Case Diagram* Enrollment System and Student Grades are Running

Use case diagrams illustrate the anticipated functionality of a system. The explanation for each use case in the use case diagram for the proposed registration and student grading system is as follows:

Table 1 ***Use Case Description***

Use Case	*Actor*	Description
Registration	Student	Admin, students, and instructors log in.
Login	Admin, Student, instructor	Admin inputs, updates, and deletes data for admin information.
Admin Data	Admin	Admin inputs, updates, and deletes data for instructor information.
Instructor Data	Admin	Admin inputs, updates, and deletes data for course program information.
Course Program Data	Admin	Admin views Student/registration data.
Student/Registration Data	Admin	Instructors view the list of students to input grades, update grades, and delete grades.
Student List	Instructor	Instructors view the list of student grades.
Student Grade List	Instructor	Students view grades.
Grades	Student	Admin views registration report data.
Student Registration Report	Admin	Admin prints student registration report.
Print Student Registration Report	Admin	Admin and instructors view student grade report data.
Student Grade Report	Admin, instructor	Admin prints student grade report.
Print Student Grade Report	Admin	Admin, students, and instructors log in.

2. Database Design

Database design is intended to define the content or structure of tables. Below is the database design for the student registration and grading information system.

3. Screen Dialog Design

Below is the screen dialogue design for the student registration and grading information system:

a. Login and Special Program Data

Figure 4. Login Screen Dialog Design Add Employee Data Dialog Screen

b. Data instructor

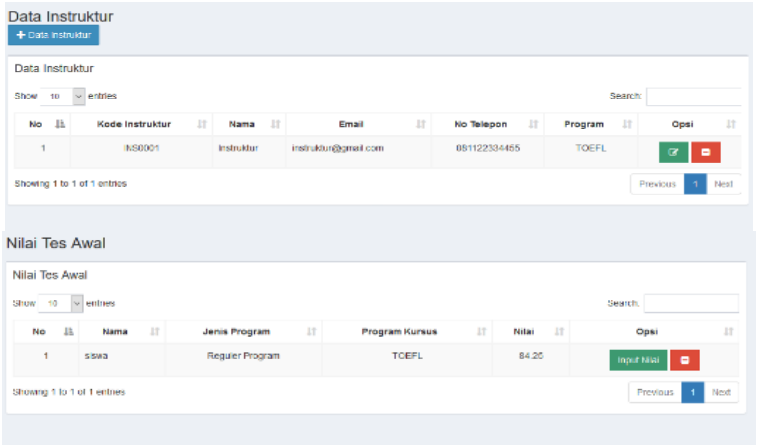


Figure 5. Design of Data Instructor Screen Dialog and Initial Test Grade Dialog

c. Registration Report

Figure 6. Registration Report Dialog

d. Data Instructor Report

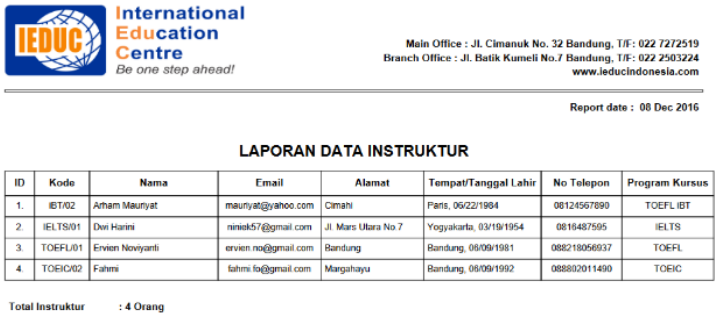
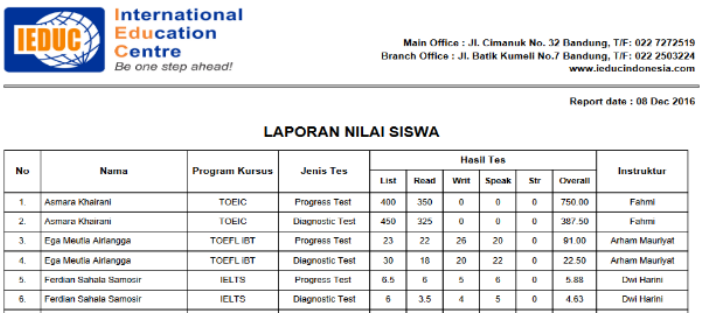


Figure 7. Dialog Draft Data instructor report

e. Student Grades Report



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Report date : 08 Dec 2016

LAPORAN NILAI SISWA

No	Nama	Program Kursus	Jenis Tes	Hasil Tes						Instruktur
				List	Read	Writ	Speak	Str	Overall	
1.	Asmara Khairani	TOEIC	Progress Test	400	350	0	0	0	750.00	Fahmi
2.	Asmara Khairani	TOEIC	Diagnostic Test	450	325	0	0	0	387.50	Fahmi
3.	Ega Meutia Airlangga	TOEFL IBT	Progress Test	23	22	26	20	0	91.00	Arham Maurlyat
4.	Ega Meutia Airlangga	TOEFL IBT	Diagnostic Test	30	18	20	22	0	22.50	Arham Maurlyat
5.	Ferdian Sahala Samosir	IELTS	Progress Test	6.5	6	5	6	0	5.88	Dwi Harini
6.	Ferdian Sahala Samosir	IELTS	Diagnostic Test	6	3.5	4	5	0	4.63	Dwi Harini

Figure 8. Student Grades Report Dialog Design

4. System Implementation and Testing

a. Software Implementation

This system was built so that it can be used for online applications or web-servers. The system installation process begins with the installation of Database, Web Server, Web Browser, Text Editor.

b. System Testing

Black-box testing focuses on the information domain of the software, by conducting test cases by partitioning the input domain of a program in a way that provides in-depth test coverage.

Table 14 B*lack Box Testing*

No	Testing Forms	Data Under Test	Description
1	Unit Testing	Arbitrary data representing student registration and grading information.	Testing the functional correctness of the program.
2	Integration Testing	Arbitrary data representing student registration and grading information.	Testing the correctness of interconnected program units and modules.
3	Validation Testing	Admin Data	Testing the compatibility of the produced software with the defined requirements.

Summary

Based on the research conducted at PT. International Education Centre (IEDUC), the analysis of existing issues and the evaluation of the current system in comparison with the proposed information system lead to several conclusions as follows:

1. In the student registration and grading system at PT. International Education Centre (IEDUC), the issue arises from the inefficiency of the data input process from record-keeping to Microsoft Excel. Therefore, there is a need for a system capable of addressing this problem, aiming to enhance employee performance.
2. The design of the information system is executed using the Unified Modeling Language (UML) methodology.
3. The implementation of the information system is carried out using MySql database, Xampp Web Server, Chrome/Mozilla Web Browsers, and Notepad++ Text Editor. Testing is performed using the black box method.

Recommendations based on the research findings for PT. International Education Centre (IEDUC) are as follows: To optimize student registration and grading activities, the company is advised to adopt a more advanced application,

which will further streamline data processing. Regular maintenance of the developed information system is recommended to ensure the stability of the application and to align it with the institution's ongoing needs.

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