ISSN: 2614-6754 (print)
ISSN: 2614-3097(online)

Halaman 12046-12055
Volume 6 Nomor 2 Tahun 2022

Application of Academic Information System With Extreme Programming Method (Case Study: Jakarta International Polytechnic)

Chairul Anwar
Jakarta International Polytechnic
Email: chairul.anwar@jihs.ac.id

Abstrak

Teknologi informasi telah menjadi suatu hal yang sering kita jumpai dalam kehidupan sehari-hari. Kehadiran teknologi informasi sangat membantu seseorang dalam menyebarkan dan menerima informasi. Karena perkembangannya yang pesat saat ini teknologi informasi tidak hanya sebagai media untuk memperoleh informasi, tetapi juga dapat digunakan sebagai alat bantu dalam dunia akademik. Politeknik Internasional Jakarta memulai tahun pendidikan pada tanggal 12 September 1994 dengan jumlah mahasiswa 114 yang semula bernama Akademi Pariwisata Sekolah Hotel Internasional Jakart, kampus pertama berada di Hotel Borobudur Intercontinental. Pada tahun 1997, kemudian pindah dan memiliki gedung 3 lantai sendiri di kawasan Sudirman Central Business District (SCBD) Jakarta Selatan. Berdasarkan penelitian dan wawancara yang dilakukan peneliti, pengelolaan data yang dilakukan oleh Politeknik Internasional Jakarta perlu adanya pengelola data dengan memanfaatkan teknologi informasi hal ini perlu dilakukan agar tidak terjadi masalah pencatatan dan Data semakin bertambah setiap tahunnya. Metode penelitian yang digunakan dalam perancangan sistem informasi akademik ini menggunakan Extreme Programming. Sistem informasi akademik ini diharapkan dapat membantu pengelola Politeknik Internasional Jakarta dalam mengelola data dengan baik. Sehingga mendukung proses belajar mengajar antara mahasiswa dan dosen.

Kata kunci: Sistem Informasi, Akademik, XP

Abstract

Information technology has become a thing that we often encounter in everyday life. The presence of information technology is very helpful for someone in disseminating and receiving information. Because of its rapid development today information technology is not only a medium for obtaining information, but can also be used as a tool in the academic world. Jakarta International Polytechnic began the year of education on September 12, 1994 with a total of 114 students who were originally known as the Jakart International Hotels School Tourism Academy, the first campus being at Borobudur Intercontinental Hotel. In 1997, it then moved and has its own 3-story building in the Sudirman Central Business District (SCBD) area of South Jakarta. Based on research and interviews conducted by researchers, data management conducted by Jakarta International Polytechnic needs to be a data managerbyutilizing information technology this needs to be done so that there are no problems with recording and Data is increasing every year. The research methods used in the design of this academic information system use Extreme Programming. It is hoped that this academic information system can help the managers of Jakarta International Polytechnic to manage data well. So that it supports the teaching and learning process between students and lecturers.

Keywords: Information Systems, Academic, XP

INTRODUCTION

Information technology has become something that we often encounter in everyday life. The presence of information technology is very helpful for someone in disseminating and receiving information(Riwana, 2019). Because of its rapid development today information technology is not only a medium for obtaining information, but can also be used as a tool in the academic world(Wijaya, Fauzi, & Fatwanto, 2015). The information revolution has changed the communication system of today's world, the distribution of information networks stored on the internet proves that now that the world is getting narrower, there are no more geographical boundaries that prevent us from interacting with the global world(Nurlinda, Wanita, & Mashud, 2021). Access to the globalized world is easy, efficient, and flexible. The ease is one of the benefits obtained from globalization involving integration in various fields including education and technology. The contribution of thought from the world of education has given birth to modernization in all areas of world society today(Shafiei & Rafsanjani, 2020). Related to that, the presence of technology has improved the quality and efficacy of education itself. As the four pillars of education triggered by Unesco include learning to know, learning to do, learning to be, and learning together(Ulfa, Sugiyarto, & Ikhsan, 2017). The impact of globalization that permeates all lines of life of nations around the world has given birth to a variety of new perspectives. For example, if in the previous era or the era of the cold war, the perspective of the world is the building of the bloc, the western bloc or the eastern bloc, then the perspective of the world in the era of globalization is integration; And the world system is symbolized by the World Wide Web (WWW), which is easily found in the writing of internet site addresses. The currents of globalization have given rise to a new perspective of education. The educational strategy of conventional face-to-face education is now changing towards a more open education(Marijan & Nurajizah, 2019). Education in the future will be further optimized by information networks that enable interaction and collaboration. The use of information networks has proven its primacy and benefits for the community(Senubekti & Islam, 2021). Thus, the influx of globalization influence has changed our education so that it is more networking, open and interactive, diverse, multidisciplinary, and work productivity-oriented. Therefore, the application of academic information systems is not only necessary for today but is mandatory. Therefore, the author gets a solution to help manage academic data Based on the above,then the author compiled a study with the title "APPLICATION OF ACADEMIC INFORMATION SYSTEM WITH EXTREME PROGRAMMING METHOD"

METHOD

Research Flow Broadly speaking, the research methodology conducted and presented in this paper is described in the flow below:

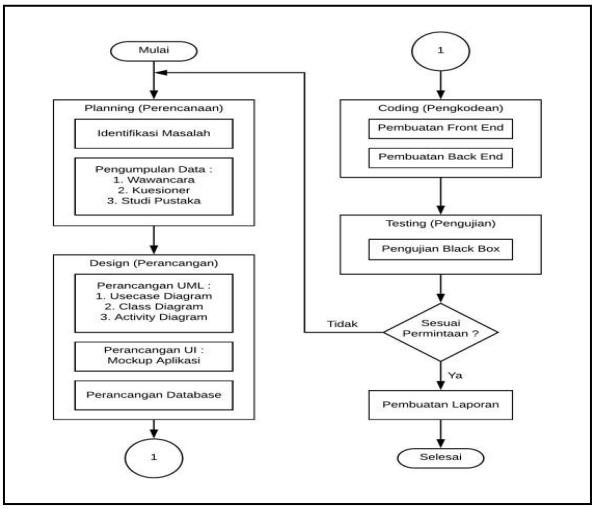


Figure 1. Research Flowchart

The explanation for the stages of Extreme Programming is as follows: :

Planning

This stage is the initial stage when building a system at this stage carried out several planning activities, namely, identifying problems, analyzing needs and setting a schedule for implementation when building the system.

Design

(Design) The next stage is the design at this stage. The next stage is the design at this stage the activities of modeling the system, architecture and database are carried out. System and architecture modeling uses Unified Modeling Language (UML) diagrams while database modeling uses Entity Relationship Diagrams (ERD)

Coding

This stage is a step to apply the modeling that has been completed into a user interface using a programming language.

Testing

When the coding stage has been carried out, then proceed with the system testing stage so that it can find errors that exist when the application is running and can find out that the system made is in accordance with the client's needs.

Design

1. UML Design

   At this stage, the authors perform UML functional designs which aim to see the system being modeled from various different aspects. The types of diagrams that the author uses are:

   a. Use Case Diagram
   b. Class Diagram
   c. Activity Diagrams

2. UI Design (User Interface)

   At this stage the author designs or designs the appearance of the android application as a whole using the Mockup technique. The author makes a mockup view for the application, its function is so that the client can clearly see the display of the user interface design results. This makes it easier for clients to judge whether this design is good or not and the layout of the features is easy to see so that it is easy to use and makes clients not easily bored with the user interface.

3. Database Design

   At this stage the authors perform analysis and application based on the data and modeling that has been done previously.

4. System Design Evaluation

   At this stage the author meets with related parties to evaluate the results of the designs that have been made previously, whether they are in accordance with the needs that have been previously determined or not, if not, repeat the design process again, if it is advanced to the next stage.

   Coding

   a. Front End Creation The Front End creation stage is a system coding stage that aims to create an application display or user interface by following the existing mockup design.

   b. Making Back End

      The stage of making the Back End is the stage of coding the system which aims to run the features and functions of the application that the author made. By translating the design of the modeling language into a programming language to be able to run the features contained in the application.

   c. Testing

      At this stage, the system that has been created is tested as a whole for all its features. Testing is done by the client which will be implemented as part of the software release.

d. System Coding Evaluation
At this stage the author evaluates the system that has been made completely, both from the appearance (User interface) or from the functional application system, whether it has fulfilled the wishes of the client or not, if not, improvements will be made to coding the application system.

e. Report Creation At this stage the author explains the whole matter of the research that has been designed, created, tested and used.

Extreme Programming

Extreme Programming is a form of agile software development process that is a methodology in the development of systems based on software development life cycle (SDLC). Extreme Programming is a methodology in system development where various stages of the development process are simplified so that a software development project can be more efficient and flexible(Fruhling, McDonald, & Dunbar, 2008; Smrtic & Grinstein, 2004). Extreme Programming is a methodology that is widely used by a company because the application of Extreme Programming is all done for clients(Stapel, Lübke, & Knauss, 2008). However, you can't be mistaken for terha dap kata-kata "programming" yang terdapat dalam Extreme Programming not only focuses on source code or coding, but covers the entire development area(Fatoni & Irawan, 2019).

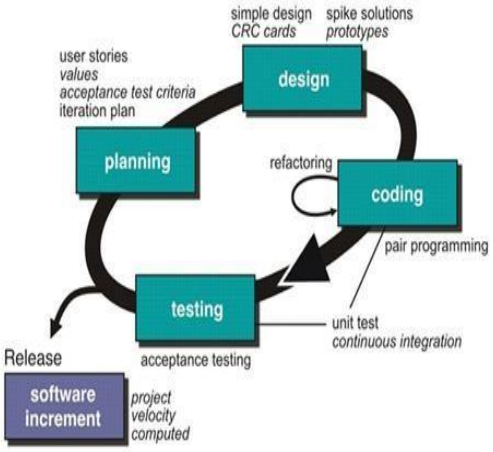


Figure 2. Extreme Programming Concept

RESULTS AND DISCUSSION

System Design Stage

1. Needs Analysis

At this stage, identification of problems and analysis of user needs and system requirements is carried out to design the system. The results of the processing and data collection of questionnaires carried out by the author can be identified several problems and the percentage level of user needs for the application.

A total of 68.1% answered that data management in academic information systems is very much needed. 70.2% agree that a manual system will be more effective if it is integrated into an information system. A total of 72.3% agree that there are obstacles in data management, causing frequent errors in recording data and losing data, 83% needing an academic information system application. As many as 85.1% want applications that are made mobile-based so that it is easier for students and lecturers.

a. System Requirements

In designing this application so that the designed application does not go out of the initial plan of application design, it is necessary to have boundaries to focus the purpose of this application. System requirements that will be defined are functional

requirements and non-functional requirements. Non-functional requirements are focused on behavioral properties owned by the system, such as:

1) The system used must be user friendly to make it easier for users to interact with the system.
2) Security system the Admin Log In system is equipped with password_hash and password_verify.
3) Log In security system in the mobile application, especially passwords, is equipped with password_hash.
4) A fast and stable internet connection is required for the system to run properly.

b. Functional Needs

Android-based academic information systems at Jakarta International Polytechnic have functional needs of the system, namely:

1) The system must be able to provide a Log In form to the User, which contains a phone number and password for the Log In, as well as logging out on the mobile application.
2) This system provides access to Admins, lecturers and students to Log In.
3) This system provides the option of Logging In or logging out.
4) System in Admin is a web application that can perform data input, editing, updating data, deletion, and data storage.
5) Admin system can manage Admin accounts, lecturers and student accounts.
6) The system for lecturers should be able to provide features to manage studentabsences, student values, daily activities and academic development of students.
7) The system for students should be able to provide features to see announcements, campusfacilities, absences, student test scores, daily activities, as well as obligations or bills for students .

2. System Plan

The system design for the application of academic information system consists of 3 actors, namely students, lecturers and admins.

Table 1. Description of Use Case Log in / Log Out

Use Name *Case*	*Log In* and Log *out*
Actor	Lecturer,, Student *(User), Admin,* <<*Service*>> Validation
Brief description	Serves as a page containing *the login*form, *Admins* and *Users* who have been registered in the *database* will enter *username* and *password* and then <<*service*>> validation receive information entered by *admin* to check whether the inputted data in accordance with those in the *database,*after validated *Admin* can process data.
Basic actions	1. *Admin* or *User* enter the phone number and *password*. *2.* After completing the activity, *Users* and *Admins Do the log out process*
Alternative actions	The phone number and *password* are incorrect.
Early conditions	The actor entered the phone number and *Password*
Final conditions	*Users* and *Admins* have *logged Out*

a. Dashboard

In table 2 describes the workflow specifications of the Use Case Dashboard diagram.

Table 2. Description of Use Dashboard

Use Name *Case*	*Dashboard* Page
Actor	*Admin*
Brief description	In the initial view of the completion of *Log In,*the actor will be rushed to the *Dashboard*page, where on this page consists of several *display icon* images where the *icon* represents the number where each data of students, lecturers and courses that entered then the number It follows the number that comes in.
Basic actions	Select the menu to find out more.
Early conditions	Once the actor goes through *Log In* it will open the *web* application.
Final conditions	Display *icons* that represent from each menu of the web application.
Use Name *Case*	*Dashboard* Page

b. Student Data Processing

In table 3 describes the workflow specifications of the Use Case diagram managing student data.

Table 3. Description of Student Data Processing Use

Use Name *Case*	Student data
Actor	*Admin*
Description brief	Actors can see, adding, change, delete student data
Basic actions	1. Display student data 2. Add student data 3. Change student data 4. Delete student data
Early conditions	After *login* the actor can select the student data menu
Final conditions	View details of student data
Use Name *Case*	Student data

c. Lecturer Data Processing

In table 4 explain about the workflow specifications of the Use Case diagram managing lecturer data.

Table 4. Description of Use Processing Data Lecturer

Use Name *Case*	Lecturer Data
Actor	*Admin*

Description brief	Actors can display, add, change, delete lecturer data
Basic actions	1. Display lecturer data 2. Add lecturer data 3. Change lecturer data 4. Delete lecturer data
Early conditions	After *logging in* the actor can select the lecturer data menu
Final conditions	View details from lecturer data

d. Data Processing Courses

In table 5 explain about the workflow specifications of the Use Case diagram managing course data

Table 5. Description of Use Processing Data Course

Use Name *Case*	Course data
Actor	*Admin*
Description brief	Actors can display, add, change, delete course data
Basic actions	1. Showing courses 2. Add courses 3. Change the course 4. Delete courses
Early conditions	After *login* the actor can select the course menu
Final conditions	Displays detailed data from the courses
Use Name *Case*	Course data

e. Data Processing Facilities

In table 6 describes the workflow specifications of the Use Case diagram managing facility data.

Table 6. Description of Use Data Processing Facilities

Use Name *Case*	Manage facility data
Actor	*Admin*
Description brief	Actors can display, add, change, delete facility data
Basic actions	1. Display facility data 2. Add facility data 3. Change facility data 4. Delete fasiltas data
Early conditions	After *logging in* the actor can select the facilities menu
Final conditions	View detailed data from the facility
Use Name *Case*	Manage facility data

f. Billing Data Processing

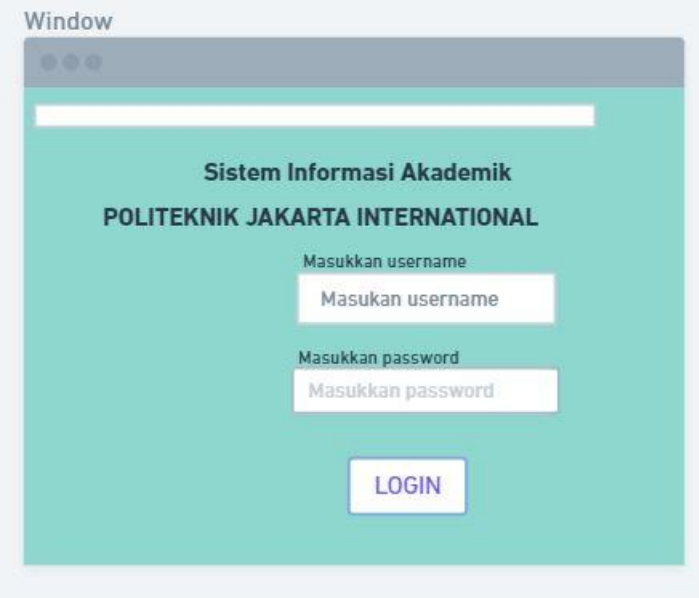
In table 7 describes the workflow specifications of the Use Case diagram managing billing data.

Table 7.Description of Use Billing Data Processing

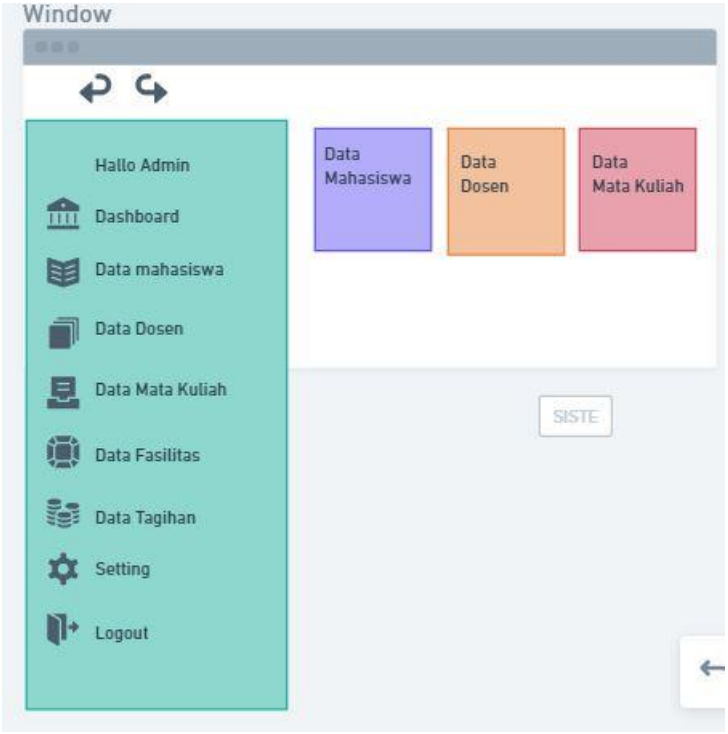
Use Name *Case*	Student bill data
Actor	*Admin*
Description brief	Actors can display, add, change, delete student bill data
Basic actions	1. Display student bill data 2. Add student bill data 3. Change student bill data 4. Delete student bill data
Early conditions	After *logging in* the actor can select the student bill data *menu*
Final conditions	View details from billing data mahastudent
Basic actions	1. Display student bill data 2. Add student bill data 3. Change student bill data 4. Delete student bill data

3. Prototype Design

a. Jakarta International Polytechnic Information System Login Page Interface



b.Interface Dasboard Admin



c.Interface User Login Menu

CONCLUSION

Based on the results of this writing it can be concluded that: 1.The achievement of the creation of this academic information system can make it easier for the manager or administrative section of The International Polytechnic to convey information more broadly than before. This academic information system can make it easier for the campus to manage the data of both students and lecturers.

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