

# Designing academic advising information system using prototyping method

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**Abstract.** Academic custody is done at the beginning of the coming semester. Academic custody is conducted to assist students in determining their lectures. This activity is usually done through face-to-face meetings between students and academic supervisors. Administrative management of academic guardianship activities conducted manually can cause some problems such as redundancy of data that can lead to impact on data accuracy, response time and ease of obtaining information. Such problems can be anticipated through the development of computer-based information systems. So, the purpose in this research is the development of computer-based academic guardianship information system using prototyping method. Based on the results and discussion is believed that the use of prototyping methods can increase the interaction between system users with system developers so that the end result of system development in the form of the main menu of the system can accommodate the desires of system users tailored to the needs of business organizations. Based on these results it can be concluded that the development of computer-based systems can handle problems caused by processing manually. In addition, the development of the system using prototyping method is able to accommodate prospective users of the system so as to support the needs of the organization in terms of data management and information.

## 1. Introduction

Academic custody usually takes place at the end of the semester or at the beginning of the upcoming semester. The aim is to help students identify the courses taken taking into account the GPA. This activity will require some supporting documents such as student data, lecturer data, course data and academic transcripts. Manage the document manually will cause problems caused by the redundancy of the data so that the impact on the accuracy and response time.

The results of academic advising activities will provide the university with information regarding the number of registered students, the student distribution per course, the number of classrooms required, the number of lecturers should be provided, and how courses should be scheduled in the imminent semester. Given that all of these data and information need to be comprehensively and integrally processed, a computer-based system application is worthy of much consideration, especially when data transactions increase due to the increase in a number of registered students [1][2][3].

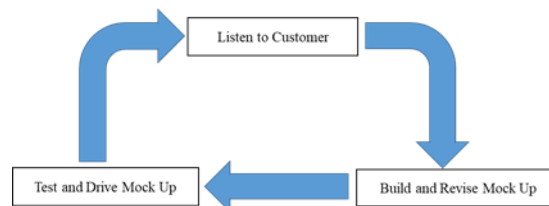


Problems related associated with a paper-based academic advising practice such as slow response time, low accuracy, and low availability could be dealt with by eliminating the data redundancy. This can be done through a database designing [4][5][6].

Implementation of information systems can facilitate the implementation of academic guardianship. Implementation of information systems can facilitate a person / organization to run its business processes effectively and efficiently and can provide information quickly, precisely and accurately [7][8][9][10][11][12]. This paper describes the design of academic guardianship information systems using prototyping methods with the aim of supporting the availability of precise and accurate data and information on academic guardianship activities.

## 2. Methodology

This study focuses on the results of the analysis of the system running. The results of the analysis concluded that the running system has several weaknesses as a result of handling done manually. Therefore, need for system development. To do system development can be done by using some approach, that is conventional approach or object-oriented approach. One method categorized into the conventional approach is prototyping. System development through prototyping models [13] offers several benefits such as intensive coordination with potential users and a relatively short engineering process (Figure 1).



**Figure 1.** Prototyping model [14].

### 2.1. The Listen-to-Customer Stage

Captions This stage is to identify the needs of prospective users by designing business process, document identification, main menu and user interface structure.

### 2.2. The Build-and-Revise-Mock-Up Stage

This is a follow-up to the results of need analysis at the previous stage. This stage begins with a database designing based on the menu and user interface design. The next process is translation to the programming language and determining the supporting software and hardware.

### 2.3. The Test-and-Drive-Mock-Up Stages

At this stage, the simulation performed. At this stage, the simulation is performed through a coordination with prospective users to figure out to what extent the system can accommodate their needs. When there is a need for improvement, it goes back to the Listen-to-Customer Stage and so on until all of the users' needs well accommodated.

## 3. Result and discussion

### 3.1. Identification of business process needs

Equations Business process description [15]:

- Students get the academic transcript from the Bureau of Academic Administration.
- Students prepare the study plans card.
- Students meet and consult the academic advisor.
- The academic advisor helps students identify what classes to take in the imminent semester.
- When a conclusion as to what classes will be taken has been reached, both students and the academic advisor sign the study plans card.

- The signed study plans card is returned to be acknowledged and signed by Head of Bureau of Academic Administration.
- The Bureau of Academic Administration staff records and archives the academic advising documents for future use.

Through the business process design, the system tries to facilitate the communication and coordination to support the management performance. The identified document further analyzed in terms of quality and quality.

### 3.2. Document identification and file classification

The document identification based on the following business process:

- List of students who take parts in academic advising
- List of courses the students take
- List of academic advisors
- Number of classrooms required
- Number of lecturers
- Lecture schedule
- Attendance lists
- List of midterm test grades
- List students' final grades

File classification:

Master File:

- Students
- Course Outlines
- Academic Advisors
- Lecturers
- Classrooms
- Lecture schedule
- Transaction Files:
- Academic Advising

Report File:

- Recapitulation of students and lecturers' attendance
- Recapitulation of number of courses of each student
- Recapitulation of number and distribution of classrooms
- Recapitulation of lecturers
- Recapitulation of academic advisors
- Distribution of academic advising activity transaction

One of the key features of computer-based information system is the use of database technology. The database designed conventionally, usually using a relational approach. The relational approach to database designing carried out through the following stages [16]:

- Business process designing
- Identification of entity and relation as well as its attributes
- Designing relation and entity diagram
- Normalization
- Designing structured query language
- Translation into programming language

Through document identification and file classification, the identified files and documents adjusted to the existing business process. This is data facilitate the designing of menu structure [17] and database.

3.3. Designing main menu structure

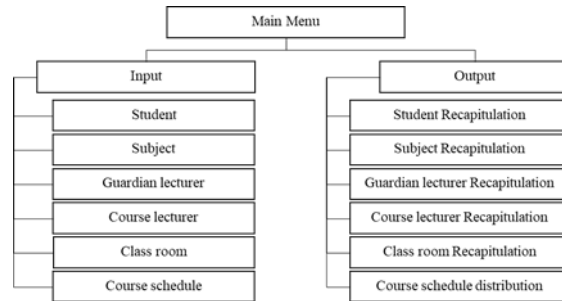


Figure 2. Main menu structure of academic advising system [14].

The user interface is designed based on the identified menu structure. The user interface elements should be designed very carefully because the design will determine the entity and relation during database designing.

3.4. Designing user interface

Figure 3. Student interface.

Figure 4. Lecture interface.

Figure 5. Course interface.

**Figure 6.** Classroom interface.

**Figure 7.** Course schedule interface.

#### 4. Conclusion

The system, the developed system aims to overcome the problems that occur in the system that is running. The problem is the redundancy of data that affects the accuracy, ease and speed to obtain information so that needs to be done system development. Prototyping can be used to design academic advisory information systems. Based on structural design results, the main menu proves to be relevant to existing business processes. The results of this study recommend that information systems be implemented to facilitate academic consultation services

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