Design information system of registration and scheduling information laboratory of information systems and the decision of Bandung Islamic University

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Abstract. The development of information technology in the field of industry is very important and it takes on the world of work. Information systems are used as a tool for taking a decision in a forefront. In this case the problems often encountered in the laboratory is still using conventional spring system by means of recording and storing the archives using the Microsoft Excel application, it takes a lot of time at the time of input and determination student teaching schedule so that the required report has delay constraint information giving rise to the proceedings and time inefficient. Approach in the development of an information system using the method Framework for the Application of Systems Thinking (FAST), Model Driven Development with strategy. The FAST method using a tool used for analyzing and designing the system. The tools which are Use Case Diagrams for communication between entities, Entity Relationship Diagram for the relationships between entities, and Data Flow diagrams for data flow between entities and processes. Stages FAST method used in the study that is up to the stage of building and testing. On the functional needs of the system that was designed as a system that can apply practical lab course schedule and choose easily and can do data reports results of students who follow the teaching. After that is done the analysis of decision is to determine and select the best candidate solutions, namely the candidates by using the MySQL database. In doing this the system design using the MySQL database with the XAMPP tool in designing a database information system registration and scheduling and Sublime Text display in designing information systems. With this system he designed, is expected to assist the laboratory in managing student data to making the student reports quickly and precisely. Keywords: Framework for the Application of Systems Thinking (FAST), Model Driven Development Strategies, MySQL Database.

1. Introduction

Science and technology currently so thriving. These developments include various areas of life that all of that influence on life and human development. The role of the technology industry especially in computerized application Systems in an organization that is one of the roles that cannot be omitted in its activities. Computerized we know only as the human tools in a variety of learning, now has become a system that is integrated, making it as a tool to assist in a learning activity.

   Learning activities are carried out not only in the classroom but can be done in a laboratory campus. Own laboratory is the place where used to apply, implement and support science, and material given in the lectures. These learning activities not only provide information about the practical work, however
this activity relates to the information systems service system provided speed at the time of teaching. In this case one way that can be done by a lab management is by trying to acquire, improve, and maintain a practical comfort.

In fact until recently Laboratory information system and the decision (LSIK) still use conventional spring system that is by way of taking notes and recap archive using the Microsoft Excel application, it takes a lot of time at the time of filling and the determination of the student teaching schedule so that the required report has delay constraint information giving rise to the proceedings and time inefficient. In addition the number of praktikan that are disproportionate to the number of assistants also affect the registration process and the determination of practical work schedule. Another fact that often occur in the laboratory is the occurrence of conflicting schedules between lectures and practical work, students/student. In other circumstances, the accuracy of (accurate), human errors and security (safety) data that is processed is not guaranteed, as well as the absence of supporting software in the activity of making attendance and scheduling teaching.

Concerned about the comfort of the practical system, based on the analysis of the PIECES against the students will follow the teaching. In providing analysis or evaluation of a system, can be done with some models of analysis. In this research, will be used in the model identification PIECES Framework. PIECES of his own Framework is a tool in analyzing computer-based information system, which consists of points – an important issue useful points to be made as a guide/reference in identifying such systems. Can be briefly described in Table 1.

Table 1. Analysis of the PIECES.

| P  | Performance | Performance system available today is still a conventional spring system by means of recorded manually. |
| I  | Information | Information the information presented is not entirely practical to students. |
| E  | Economy     | Economy Benefit yg can be achieved i.e. reduce buildup files which will not be used again. |
| C  | Control     | Control Security systems that can eliminate physical evidence that students follow practical data. |
| E  | Efficiency  | Efficiency the efficiency of people involved in the process of good teaching assistant or student. |
| S  | Service     | Service rendered practical Service that either the information or data provided at the time of teaching. |

Based on the background of the above problem, then research objectives to be achieved based on the formulation of a problem which has been described above, namely the following:

- Identify the attendance and scheduling information system that is running on a laboratory information system and the decision (LSIK).
- Analyze the needs of the information system of registration and scheduling that can facilitate practical work in accessing information on Laboratory information system and the decision (LSIK).
- Designing the system of registration and scheduling is needed on the information systems needs of Laboratory information systems and Decision (LSIK).
- Build the system registration information and scheduling that can facilitate students in registering and determining the desired schedule.

2. Method

According to Oetomo and Dharma, information systems can be defined as a collection of elements that are related to each other to form a single entity to integrate data, process and store and distribute information [1]. In other words, the information system is the unity of the elements that are interrelated in systematic and regular to and from the flow of information that will support decision making and do control the operations of the company. In addition to supporting decision making, coordination, and control,
information systems can also help managers and workers to analyse problems, visualize a complex subject, and creating new products.

System information contains information about people, places, and things that are important in the organization or the surrounding environment. With the intended information i.e. data that has been formed into a form that is meaningful and useful to humans. Data, by contrast, is the flow of the raw facts that represent events that occurred in the organization or the physical environment before organized and compiled into a form that can be understood and used by people.

Based on Bentley and Whitten, FAST developed as a combination of the best practices that have been found in many commercial and reference methodology [2]. FAST is a framework that is flexible enough for many types of projects and strategies, as shown in Figure 1. FAST has much in common with commercial-based book and methodology that would be found in practice. A project starts with some combination of problems, opportunities and instructions from the user and ends with a solution to information system user community. There are 7 using the FAST method:

- Stage 1-Scope Definition
- Stage 2-Problem Analysis
- Stage 3-Requirement Analysis
- Stage 4-Logical Design
- Stage 5-Decision Analysis
- Stage 6-Physical Design and Integration
- Stage 7-Construction and Testing
- Stage 8-Installation and Delivery
- Stage 9-System Operation and Maintenance

![Figure 1. FAST methodology phase.](image)

Source: Bentley and Whitten [2].
2.1. Tools used in the method of FAST
The FAST method of using some of the tools used for analyzing and designing the system. The tools which are Use Case Diagrams for communication between entities, Entity Relationship Diagram for the relationships between entities, and Data Flow diagrams for data flow between entities and processes.

2.2. Use-case diagrams
Use-Case Diagrams identify and describe the functionality of the system from the view of the external users and in the things that they understand. Use-Case Diagram is a picture of the activity of the scenario, both the activity of the automation or manual, with the aim of completing a task system information.

2.3. Data Flow diagrams
Data Flow Diagram is a tool that allows professional modelling system, to describe the system as a network of functional processes that are connected to each other with the data flow, both manually as well as computerization. In Data Flow diagrams there is a process of conversion of inputs into outputs. To facilitate the reading of Data Flow diagrams made multilevel/level from level 0 to level that is required of them, namely:

2.3.1. The context diagram. Context diagram is the highest level of Data Flow diagrams (DFD), which shows the system as a process. The aim is to give a general view of the system. The context diagram shows a process that interacts with its environment. There is an External Entity that provides input (input) and there are parties who receive outputs (output) of the system.

2.3.2. Zero diagram. Diagrams are located one level below the Context Diagram illustrating the main processes of the system. The things depicted in the diagram is the main process of the Zero system as well as the relationship of terminator or entity processes, data flow and data store.

2.3.3. The level of the diagram (Diagram n Level). Diagram of level n is the result of the decomposition of the diagram of the zero, which describes the process in greater detail. Derived directly from the diagram called a zero level 1. And if the diagram level 1 can be described again then will form a diagram of level 2, and so on.

Four basic symbols are used to map the movement of data in the diagram the flow of data: the double arrow, rectangle, rectangles with rounded corners, and a rectangular open (closed on the left side and open ends to the right), as shown in. The entire system and many of the subsystems can be described graphically with the four symbols in combinations [3].

PIECES originally came from James Wetherbe who develop a useful framework to classify categories. These categories include:

- P the desire to improve or develop performance.  
- I desire to improve or develop the information.  
- E desire to improve or develop the economy.  
- C desire to improve or develop the control.  
- E desire to improve or develop efficiency.  
- S desire to improve or develop the service.

3. Results

3.1. Design of information system of registration and scheduling information systems laboratory and practical decisions

3.1.1. Modeling interface using the usecase diagram. Communication system model is described using use-case diagram. Use-case is an interaction that is made or accepted by the actors and the relationship linking between actors and use-case so it will note the functions that exist in the system. Use-case
diagram consists of several components, namely the use-case, the actor, and the relationship (relationship). As for the data modeling with use-case diagrams can be seen in Figure 2.

![Use-case diagram](image-url)

**Figure 2.** Use-case diagram (system functional requirements).

3.1.2. Process modeling using data flow diagrams. Context diagram illustrates the relationships between the three entities, among others, Assistant, praktikan and lecturer. As for the system context diagrams can be seen in Figure 3.

![Diagram of the physical context](image-url)

**Figure 3.** Diagram of the physical context.
3.1.3. System interface. The system interface in the making of the program refers to the design of the interface which has been designed before. As for the description of the interface for user Assistant can be seen in Figure 4.

![Student user system interface](image)

**Figure 4.** Student user system interface.

3.1.4. Proposed business process system. The following is a business process systems below shows an overview of the information system usage aluar was created. The business process is divided into two processes to business processes registration and scheduling, Business Process and reporting of laboratory teaching system of information and decisions. As for a general overview of business process system can be seen in Figure 5 and 6.

![The process of Business Registration and scheduling](image)

**Figure 5.** The process of Business Registration and scheduling.

As for the explanation of the Figure 5 above, namely:

- Students do practical work, what will register dahulun register your account to sign in to the student information system.
- Student login by entering your username and password in advance to get into information systems.
- After you sign in to the Student information system, do check the registration schedule for elections and do practical work, practical work, as scheduled in the blank provided.
- Once a student enters personal data then the student is already registered.
- Students can mengeprint card lab course as one of the conditions of practical lab.
As for the explanation of the Figure 6 above, namely:

- Admin login by entering your username and password in advance to get into information systems.
- Admin selects the menu data registries and practical lab course schedule to see the data that was already done.
- Admin doing data export data of students follow practical to Microsoft Office Excel files.
- Admin doing practical work, report print to create data reports student.

4. Discussion

The Framework is the skeleton PIECES that are able to classify a problems, opportunities, and the directives contained in the section on scope definition of analysis and design of the system. With this framework, can be used as consideration in the development of the system. That in this problem are analyzed using the methods of the PIECES where this method is a method of analyzing based on aspects of performance, economy, information, control, efficiency and service. In the overall aspect has its own improvements to increase the convenience of teaching in the laboratory, so that all information and material provided is effectively can be well received.

In the study of the current system, once observed menggunalan model analysis PIECES Framework. PIECES of his own Framework is a tool in analyzing computer-based information system, which consists of points – an important point that is useful to serve as guidelines/reference in analyzing the system. Can briefly described in table 2.

| PIECES | System Analysis |
|--------|----------------|
| P      | Performance    |
| I      | Information    |
| E      | Economy        |
| C      | Control        |
| E      | Efficiency     |
| S      | Service        |

5. Conclusion

Based on the results of the research that has been done, then some things that can be concluded are:

- The practicum assessment system that runs in the Information System and Decision Laboratory is currently still using a conventional system, starting from the practicum card manufacturing process, the process of inputting practicum values on practicum cards and on computers, up to
the making of practicum assessment reports. So that the problems faced by the laboratory include the time needed to manage practicum appraisal data relatively long, there is a risk of data loss, there are paper expenses for printing practicum cards, and there is no security system so anyone can access the system easily.

- The need for an information system for practicum assessment in the Information and Decision System Laboratory, which is a system that can facilitate the processing of practicum value data, provide storage and data security values that can only be accessed by certain parties, and facilitate the presentation of practicum value information.

- Designing proposals for improvement of the practicum assessment system on the block process using Data Flow Diagrams (DFD) obtained the results of architectural processes in the application of practicum assessment system. Data blocks using Entity Relationship Diagrams obtained the results of the practicum assessment database system consisting of assistant tables, students, lecturers, practicum assessment, presentation assessment, registration and major assignments. The communication block uses the Use-Case design model diagram obtained by the interface design from the practicum assessment system.

- Development of practicum assessment information system is carried out using XAMPP tools, MySQL database and Sublime Text generated web-based practicum assessment system consisting of features such as login, input practicum values, input presentation values, large task data input, import data to excel, print cards practicum, assessment information and grading chart. Testing of the practicum assessment system that has been built can work well and is ready to be implemented.

References

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