WEB-BASED HUMAN RESOURCE INFORMATION SYSTEM
ANALYSIS AND DESIGN USING RAPID APPLICATION
DEVELOPMENT (RAD)
(CASE STUDY: INDONESIAN ADVENTIST UNIVERSITY)

Elmor Benedict Wagiu, M. Kom
Information Technology Department
Indonesian Adventist University
E-mail: elmor@unai.edu

ABSTRACT: Human resource management within an organization is crucial due to its direct
impact to the organization’s performance. Furthermore, the utilization of information system
facilitates human resource management. This research aims to (1) compare between the old
system and the proposed system, (2) build a human resource management information system
to better document employees’ data, and (3) thus, the resulting information is clear to support
future decision making process. In this research, author employed Rapid Application
Development (RAD) methodology. This methodology is a further development of the classic
SDLC methodology in building information system, wherein RAD allows one or more programmers to build software simultaneously within months, even weeks, rapidly. In
conclusion, this research assists the employee-data collection process in UNAI, proved by the
information system that manage the data from all the employee much better than the old system.
Furthermore, employing RAD methodology accelerates the creation process of the human
resource management information system due to the direct feedback to the resulting
prototypes.

Keywords: information system, rapid application development, unified modeling language, web.

1. INTRODUCTION
Human resources have been viewed as a valuable asset an organization has when
compared to other resources. The progress of an organization lies in the condition of human
resources. Therefore, good management of human resources is needed, for small, medium and
large organizations. Need to be considered for a large scale organization, because the greater
the organization the more human resources in it. With the increasing number of human
resources, the management of human resources should be more attention.

Indonesian Adventist University is one of the universities located in West Bandung
regency. UNAI has 3 levels of education starting from the level of Diploma to Master Program,
which consists of 6 faculties with 11 majors of undergraduate program and 2 majors of graduate
program, so UNAI has a lot of human resources consisting of Lecturers, Staff and Students
who work while studying (Student Labor). Judging from the fact that happened, UNAI not yet have a human resource management information system. So far, the system used is still using conventional or old ways.

Therefore Indonesian Adventist University needs an information system that can manage the existing human resources well, so that this information system can improve organizational productivity. It is also expected that this information system can be integrated with UNAI Online System, so there is some important information related to human resources that can be interconnected.

2. LITERATURE REVIEW

2.1 Information System

According to Soeherman and Pinontoan (2008), The information system is a set of human components, procedures, data and technology (such as computers) used to perform a process to produce valuable information for decision making.

While Marimin, Tanjung and Prabowo (2006) adds that the information system is a collection of components within a company or organization that relate to the process of creating and transmitting information.

Thus, the essence of information systems is a collection / series of components or elements in the form of humans, procedures associated with the creation process of information and to produce valuable information for the process of making a decision.

2.2 Human Resource Management

Hariandja (2007) gives two explanation about human resource management. Personnel management are planning, organizing, directing and supervising the activities of procurement, development, compensation, integration, maintenance and release of human resources in order to achieve organizational and community goals.

The other definitions is, the determination and implementation of various activities, policies and programs aimed at obtaining manpower, development and maintenance in an effort to increase its support to increase organizational effectiveness in ways that are ethically and socially accountable.

Meanwhile, according to Cascio in Umar (2003), human resource management includes planning, organizing, mobilizing and supervising procurement, development,
compensation, integration and termination of employment with the intention of achieving the objectives of the organization in an integrated manner.

2.3 Rapid Application Development Methods

According to the O'Brien in Gaol (2008), Rapid Application Development is sometimes referred to as the work of the basic form (prototyping). Work on this basic form also makes the development process faster and easier for the user because RAD simplifies and aligned system design.

Then, according to the Post in Gaol (2008), RAD is the goal of building a faster system than the SDLC method. By using more powerful tools (database management and high-level programming languages), highly trained programmers can build the system in weeks or months. By using CASE working groups, communication networks, and devices, small groups can improve development and design steps. RAD also has some similarities to the prototyping method, which is a technique of designing a profitable system from high-level devices. The purpose of RAD is to follow a more formal project approach in addition to looking for steps that can be reduced or displayed at the same time.

Laudon in Gaol (2008) illustrates that RAD is a system development process in a short period of time using prototyping, fourth generation devices, and close working groups between users and system experts. RAD is used to describe the process of making a system that can work in a short time. RAD can consist of the use of visual programs and other tools in building graphical user interface, iterative prototyping of the most important elements of the system, the generation of program codes, and close workgroup among end users and information systems experts.

McLeod in Gaol (2008) adds that RAD is a methodology that has a goal of responsive speed for user needs like prototyping method but RAD is wider in scope.

So from some of the above definition can be concluded that the RAD method is a method of development of the classical method of SDLC, where RAD is a method that allows one or several programmers to design a software in a matter of months and even weeks, so this method is a method to build information system quickly.
3. DESIGN OF INFORMATION SYSTEMS

3.1 Use Case Diagram that Proposed for the New System

In Figure 3.1 below is given use case diagram of proposed new system. These use case has 4 actors namely, Lecturer, Staff, Student Labor and Admin.

The use case of each actor is as follows:

1. Lecturer Actor
   a. Login
2. Staff Actor
   a. Login
   b. Input staff data
   c. Input leave data
   d. Input performance appraisal

3. Student Labor Actor
   a. Login
   b. Input student labor data
   c. Input performance appraisal

4. Admin Actor
   a. Login
   b. Manage employee data
   c. Manage fired employee data
   d. Manage leave data
   e. Manage employee recruitment data
   f. Manage academic data
   g. Manage performance appraisal data

3.2 Activity Diagram

3.2.1 Login Procedure Activity diagram

Figure 3.2 below shows the activity diagram for the login procedure. The first step done by the user is to enter a username and password. After that the system will validate the input results from the user. If the username and password data entered by the user in accordance with existing data in the system, then the user can enter into the system. But if the data does not match, then the system will give an error message, and the user is asked to re-enter the correct username and password.
3.2.2 Personal data input Procedure Activity diagram

Figure 3.3 below shows the activity diagram for the personal data input procedure. The user will enter the data requested by the system. After the data is filled then the user will press the save button. In this process, the system will check whether the data entered by the user is complete or not. If data is incomplete or still empty, then the system will issue a warning for the user to re-check all the data whether it is complete or not and asked also to fill the unfilled. If all data is completed and filled properly, then the data will be stored in the system.

3.2.3 Activity diagram of the Leave Submission Procedure
Figure 3.4 below explains the activity diagram of the leave submission procedure. Each lecturer and staff are entitled to a leave in accordance with the applicable provisions. If they wish to apply for leave, lecturers and staff must complete the necessary data. Then the system will check whether the data entered is complete or not. If not complete then the system will give a message that the data entered is not complete, and the system will ask the user to complete the uncomplete data. If the data entered is complete, then the system will store the data.

Figure 3.4 Activity diagram of the Leave Submission Procedure

3.2.4 Approval Leave Application Activity diagram

Figure 3.5 below shows the activity diagram for the approval procedure of the leave application. A meeting will check the application for a leave of absence in the system. Then will be examined on the feasibility of the request. If deemed not feasible then the application is rejected and the data rejection will be stored in the system. If feasible, then the application will be approved and approval data will be stored in the system.
3.3 Sequence Diagram

3.3.1 Login Procedure Sequence diagram

Figure 3.6 below explains the sequence diagram of the login procedure. Faculty, staff, student labor, rector, dean / head of dept and admin will go to the login form, and then enter the username and password. Then the system will check in the database whether the data is already registered or not. If not already registered, then the system will issue a message that data entered wrong / not registered in the database, and the user will be asked back to enter the correct username and password. If at the time of login data username and password is correct then the user will be directed into the system / main menu.
3.3.2 Personal data Input Sequence diagram

Figure 3.7 below explains the sequence diagram of the personal data input procedure. Lecturers, staff and student labor are required to input the personal data and other data requested by the system. After the user fills in all the requested data, the user will press the save button. At the same time the system will check all items / sections to be filled by the user whether it is complete or still there is empty / not yet filled. If there is still a blank / unfilled section, then the system will give the message that the data is not complete, and the user is welcome to look for the empty part and fill it. If at the time penginputan all the parts are filled, then the data will be stored in the database.

![Diagram](image)

Figure 3.7 Personal data Input Sequence diagram

3.3.3 Sequence diagram of the Leave Submission Procedure

Figure 3.8 below explains the sequence diagram of the leave submission procedure. Lecturers and staff are required to input data on the application for leave and other data requested by the system. After lecturers and staff fill in all the requested data, lecturers and staff will press the save button located on the input form of the data submission of the leave. At the same time the system will check all items / sections to be filled by lecturers and staff whether it is complete or still there is empty / not yet filled. If there is still an empty / unfilled section, then the system will give a message that the data is not complete, and the lecturer and staff are welcome to look for the blank part and fill it. If all the parts are filled, then the data will be stored in the database.
3.3.4 Approval Leave Application Sequence Diagram

Figure 3.9 below shows the sequence diagram for the approval procedure of the leave application. A committee will approve the application for a leave of absence by lecturers and staff. Approval will be made when it meets the specified requirements. If the lecturer and staff meet the requirements, approval may be made, and the approval data will be stored in the database.

3.4 Class Diagram

Class Diagram of the design of this information system can be explained through the figure 3.10 below.
There are 11 tables in this class diagram, among others are student labor table, employee table, faculty table, department table, leave table, fired table, majors table, student labor performance appraisal table, employee recruitment table, employee performance appraisal table, and employee development table.

3.5 Deployment Diagram

Deployment diagram serves to show the hardware architecture that is connected with other hardware. Figure 3.11 below shows the deployment diagram for human resource information system at Indonesian Adventist University.
4. RESULTS AND EXPLANATION

4.1 Interface of the Sign In Page

In this interface the user is required to fill in the username and password corresponding to the one that has been registered. Then the system will check whether the data is valid or not. If valid then the user can enter into the system, but if invalid then the user will be asked to enter the appropriate username and password.

Figure 4.1 Sign In Page
4.2 Interface of the Homepage

Figure 4.2 below is the home page view when the user enters the human resource information system. On the left there is a menu option that can be used, including the menu employees, assessment, recruitment and others.

![Homepage Interface](image)

Figure 4.2 Homepage Interface

4.3 Interface of the Personal Data Input

Figure 4.3 below is a form used to perform data input on all employees registered at Indonesian Adventist University. Required fields are marked with a red star. Then the employment status is whether goes into the category of staff or lecturer. The department / faculty shows the basis on which the employee works. It should also be inputted early probation and the end of probation work. After all data inputted correctly and no one missed then the user will press the save button so that the data can be saved into the database. If the user presses the cancel button, the form of employee data input will still be closed. Meanwhile, if the user press the delete button, then the entire section that has been filled will be emptied.
After all data is filled and saved then it looks like figure 4.4 below. Users can then make changes by pressing edit or deleting data by pressing delete.

If users want to see more detailed data, then the user just press the name of the employee as shown in Figure 4.5 below.
5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

From the results of this research, it can be drawn some conclusions, among others:

1. This research uses Rapid Application Development method where this method is one of the fastest method to build an information system, which uses prototyping concept where when user make one prototype directly consulted to the authorities whether it is appropriate or not. In this study the process is shown by the questionnaire given by the researchers to the administrator of UNAI in this case the UNAI Foundation.

2. With this human resources information system, then the UNAI administrators can search and obtain information easily, which is related to permanent employees, non-permanent employees and student labor. Proven with this information system if the user wants to find data or information related to certain employees, then the user can search through the data search menu.

3. With the existence of this human resources information system, the data of each employee working at UNAI can be well documented in one location. Proven with the information system that has been built, all data related to employees have been stored in a centralized database.
5.2 Recommendation

The recommendations of the authors of this research are:

1. Added facilities to input research data, teaching and community service (for lecturers), so that in this information system can see the functional position of the lecturer.

2. Added facilities to synchronize between payroll employees and leave procedures, especially sabbatical, so that if employees take a sabbatical, then the employee will get incentives that have been determined by the university.

6. REFERENCE LIST


