Innovation Development of Web-Based Dormitory Information System at Boarding School SMA Terpadu Krida Nusantara

Jafrudin¹*, Yeffry Handoko Putra²
¹Master of Information System, Universitas Komputer Indonesia, Indonesia.
²Faculty of Post Graduate, Universitas Komputer Indonesia, Indonesia.

Email: *Jafrudin.75119003@mahasiswa.unikom.ac.id

Abstract. The main problem in this research is the innovation of the development of web-based dormitory management information system at SMA Terpadu Krida Nusantara. Current conditions, the boarding management system at the school is still manual and raises many problems, such as system for monitoring and reporting student data recap, resulting in the accumulation of documents in the room, and the difficulty of searching student data, as well as reporting complicated and untidy data. With the web-based dormitory management information system, it is expected to be able to simplify the process of student data recapitulation, the process of finding data, the process of documenting data, and the reporting process. The design of this study was in the form of designing and manufacturing dormitory management information systems, and the methodology used in this study was RUP (Rational Unified Process). There are four stages in the use of the RUP methodology, namely the stages of inception, elaboration, construction, and transition. By looking at the design process that has been carried out, this management information system will be very helpful in managing dormitories at SMA Terpadu Krida Nusantara.

1. Introduction

The process of managing data in the SMA Terpadu Krida Nusantara boarding school is still manual or paper-based documents. It raises problems, and there are piles of documents in the archives room, so it is very difficult if you want to search for data and make student data reports. Based on the above background, we need an innovation in the development of web-based dormitory management information systems [1] at SMA Terpadu Krida Nusantara which is expected to help the process of managing the dormitory to be better and easier to use.

The activities of the education process and boarding school management have undergone many changes, both in terms of institutional and substance, and this continues to be done by school administration and Yayasan Krida Nusantara. The purpose of establishing the SMA Terpadu Krida Nusantara is to integrate the three pillars, namely Academic, Religion, and Vocational skill. At this school has begun to adjust to the development of information technology. SMA Terpadu Krida Nusantara want to utilize information technology as a medium to assist the process of boarding management, so that it will become a web-based board management information system, which later the information system can be accessed by students' parents from their homes. Limitation problems of this study are as follows: The web-based dormitory management information system for SMA Terpadu Krida Nusantara boarding school is created using the PHP programming language and MySQL Database [2]. The web-based dormitory management information system for SMA Terpadu Krida Nusantara
boarding school includes making student input data in/out of the weekly excursion, input data on student loyalty and neatness in the dormitory, input data for student counselling guidance in the dormitory, and input data for sick students. The methodology used in this study was RUP (Rational Unified Process) [3,4] by using the UML (Unified Modeling Language) model [5,6]

The results of this study are expected to produce an application that helps the process of managing dormitories at SMA Terpadu Krida Nusantara, so the research objectives to be achieved are as follows: To create a web-based dormitory management information system for the SMA Terpadu Krida Nusantara boarding school using the PHP programming language and MySQL Database [7-10]. To make an innovation in the development of web-based dormitory management information system for the SMA Terpadu Krida Nusantara boarding school. To be able to apply RUP (Rational Unified Process) in making the information system for the management of the SMAT-KN boarding school. The benefits of this research can help the process of managing data become quickly and easily [11], so that the process of reporting student data generated will be faster.

2. Methods

In the initial stage of this research was to prepare and make a research proposal. At the application design stage, application architecture design and display design were made. In the application development stage, the research process flow followed the steps contained in the RUP (Rational Unified Process) method [12,13]. In the Inception stage [14], there are two groups of need, namely functional needs and non-functional needs. The functional needs contained in the web-based management information system of the SMA Terpadu Krida Nusantara boarding such as availability of the login function in each Dormitory unit, KSA (Students health centre) Unit, BK (Students counselling) Unit, and providing student information pages for parents, and providing Scan in and Scan Out Card functions when students cruise/leave campus. The non-functional needs used in building this web-based dormitory management information system were software and hardware requirements. In building a web-based dormitory management information system, a use case diagram [12] design was needed which was used as a design model for building an information system. Figure 1 is a use case diagram design for this research. Use case diagrams describe a system, environment and relationships between systems and their environment. In the information system that will be created, there are actors who have some general treatment to do.

In Figure 1, there are two actors in the use case diagram design namely the dormitory supervisor and students/parents. The dormitory supervisor can access the page from their access functions, while students/parents can only get information from the information pages available. The elaboration [14,15] stage was used to determine the activity diagram of a system to be built. This stage looked at the system deeper, analyzed the main problems that are being developed and started preparing the next stage,
namely construction. Activity diagram illustrates the process that runs on the system carried out by the user from the beginning of opening the system to closing the system. Figure 2 illustrates that the dormitory supervisor accesses the system, then a page will appear to view student information and be able to input student data.

![Activity Diagram of Dormitory Supervisor Interface](image)

**Figure 2.** Activity Diagram of Dormitory Supervisor Interface

After determining the activity diagram, the next step was to create a class diagram. Class diagram illustrates a static relationship of a system. The class diagram of the system to be built can be seen in Figure 3.
From Figure 3, it is explained that the user who can access the activity is the user dormitory supervisor. To be able to do activities, user dormitory supervisor must log in first. The next process after creating a class diagram is to make a sequence diagram. The sequence diagrams is used to illustrate a series of steps carried out in response to an event to produce output. The sequence diagram designed from this information system can be seen in Figure 4.
In Figure 4, it illustrates the flow process that occurs in the login sequence diagram. Then, it proceeded with the username and password checking, after that Get Data and Check Data if true and appropriate, it will enter the display. After completing the Inception and Elaboration stages, the next stage is the Construction and Transition stages. The Construction stage will focus more on the results of the proposed display design and menus. Meanwhile, the Transition phase is more focused on the testing process from the designed application.

3. Results and Discussion
After going through a series of iterations, at this stage of construction an application has been created. The login page is the start page that first appears when the application is run. Figure 5 is the result of the first page and Figure 6 display menu data input student behaviour at dormitory.
Figure 5. Display the Login Page.

Figure 6. Display Data Input of Student Behavior at Dormitory.
Figure 5 is the login page image. This login display page was used by the manager of each section to manage student data. The manager can enter the username and password that have been given, so they can enter the pages of each section. Figure 6 is a picture of the page after successfully logging in the dormitory supervisor, as well as providing the K.S.A (Students health centre) menu, BK (Students counselling), Violations, and Student Achievements. Figure 7 is a picture of the input page of students who do counselling guidance to the teacher and Figure 8 displays input data of sick students. This display page is used by managers to manage data on students who are sick and treated.

Figure 7. Display Input of Student Counselling Guidance.

Figure 8. An Image Page Displaying Input Data of a Sick Student.

Figure 9 is an illustration of the page for automatic recording when students do a card scan for a cruise and Figure 10 displays student information reports.
Figure 10 is an overview of the pages for each student's report. This page contains information about student behavior at the dormitory, information on sick students, information on students conducting counselling, information on student violations, information on student achievement, and student information on weekly excursions.

The transition phase is the final stage of the RUP (Rational Unified Process) process. In this stage the focus is more on testing problems. The testing process itself has many types. The testing process is the process of executing information systems to determine whether the system built is in accordance with specifications and can run in accordance with the desired environment. In the testing phase, it is an important part of the quality of the information system that is built and represents the main study of the specifications, design, and coding process. In this study the Black Box and White Box testing process
was carried out. Black Box Testing is the process of testing the fundamental aspects of information systems without regard to the internal logic structure of the software. This testing process was carried out to find out whether the information system that was built can run and function properly. The test results can be seen in Table 1.

| No | Testing Function     | How to                                      | Expected Result | Output |
|----|----------------------|---------------------------------------------|-----------------|--------|
| 1  | Login Checking       | A user inputs username and password         | A user enters the main page | Valid  |
| 2  | Connection Database checking | A user inputs username and password in to database using registered account | A user can access his account | Valid  |
| 3  | Input K.S.A Checking | A user inputs the data of sick students     | The data is recorded in database | Valid  |
| 4  | Input Counselling Checking | A user inputs the data of students counselling | The data is recorded in database | Valid  |
| 5  | Input Dormitory Checking | A user inputs the data of students behaviour | The data is recorded in database | Valid  |
| 6  | Report Checking      | A user clicks menu report                   | Displaying all students data | Valid  |

4. Conclusion

From the results of this study, it can be concluded as follows: The web-based information management system of SMA Terpadu Krida Nusantara dormitory management program is produced to assist facilitating the recording of students’ behavior in the dormitory, students conducting counselling guidance, students who are sick, and students during weekly excursion activities. The process of reporting student data can be easily accessed by the manager in each dormitory unit and students parents.

References

[1] Komalasari, N., Murad, D. F., Agustine, D., Irsan, M., Budiman, J., & Fernando, E. 2018. Effect of Education, Performance, Position and Information Technology Competency of Information Systems to Performance of Information System. In 2018 International Seminar on Research of Information Technology and Intelligent Systems (ISRITI) (pp. 221-226). IEEE.

[2] Yu, X., & Yi, C. 2010. Design and Implementation of the Website Based on PHP & MYSQL. In 2010 International Conference on E-Product E-Service and E-Entertainment (pp. 1-4). IEEE.

[3] Lice, E., & Biba, M. 2012. Customizing Rational Unified Process in a Systems Integration Scenario. In 2012 Sixth International Conference on Complex, Intelligent, and Software Intensive Systems (pp. 76-83). IEEE.

[4] Guo, F., Xia, B., & Xue, F. 2011. Analysis on software processes and enhancement for RUP. In 2011 IEEE 2nd International Conference on Software Engineering and Service Science (pp. 295-298). IEEE.

[5] Wang, Z. 2011. The study of smart phone development based on uml. In 2011 International Conference on Computer Science and Service System (CSSS) (pp. 2791-2794). IEEE.

[6] Jin, L., & Liang, X. 2012. System modeling of vehicle management based on RUP and UML. In 2012 Fifth International Symposium on Computational Intelligence and Design 1, pp. 53-56. IEEE.
[7] Nugroho, E. P., & Cahyana, R. 2017. A development of cloud-based PHP learning system. In 2017 3rd International Conference on Science in Information Technology (ICSITech) (pp. 674-680). IEEE.

[8] Szkarczyk, R. 2013. GNU Prolog-PHP multi-tier integration. In 2013 IEEE 7th International Conference on Intelligent Data Acquisition and Advanced Computing Systems (IDAACS) I, pp. 338-341. IEEE.

[9] Satoto, K. I., Isnanto, R. R., Kridalukmana, R., & Martono, K. T. 2016. Optimizing MySQL database system on information systems research, publications and community service. In 2016 3rd International Conference on Information Technology, Computer, and Electrical Engineering (ICITACEE) (pp. 1-5). IEEE.

[10] Ping, Y., Hong-Wei, H., & Nan, Z. 2014. Design and implementation of a MySQL database backup and recovery system. In Proceeding of the 11th World Congress on Intelligent Control and Automation (pp. 5410-5415). IEEE.

[11] Surjandari, I., Rachman, A., Panjaitan, Y. A. B., & Rosyidah, A. 2017. Development of theses categorization system search engine using PHP and MySQL. In 2017 International Conference on Information Technology Systems and Innovation (ICITSI) (pp. 194-199). IEEE.

[12] Salgado, C. E., Machado, R. J., & Maciel, R. S. 2014. Using process-level use case diagrams to infer the business motivation model with a RUP-based approach. In Information System Development (pp. 123-134). Springer, Cham.

[13] Coleman, K., Marshall, E., & Thomas, C. 2019. A Methodology for the Visualization of Rational Unified Process. Systems and Software Engineering Publication, 1(1).

[14] Mohd, H., Baharom, F., Muhd Darus, N., Saip, M. A., Yasin, A., Robie, M., & Afdhal, M. 2016. A secured e-tendering model based on rational unified process (RUP) approach: inception and elaboration phases. International Journal of Supply Chain Management (IJSCM), 5(4), pp. 114-120.

[15] Adnyana, I. K. W., Putra, Y. H., & Rosiyadi, D. 2015. Pengembangan Layanan Sistem Informasi dengan Enterprise Architecture Planning. Pusat Penelitian Informatika-LIPI Jurnal INKOM 9(2) pp. 45-80 Bandung, p-ISSN 1979-8059 November 2015 e-ISSN 2302-6146, 73, 73.