
The Development of Information Systems for Measuring Student Performance at MTs Al-Azhar Paseh Tanjung Bumi

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ABSTRACT

Education becomes a compulsive program set by the government by implementing a 12-year compulsory education to improve human resources in Indonesia. A part of primary education concerns and results from measurement of student performance, that we call it school report cards. The main aim of this research is to build a school grade information system to help teacher and the homeroom teacher in input school report cards. Development of this system has built by applying the waterfall model. Data obtain to making this system, we use two elicitation techniques, questionnaire and interview technique. The advantage of this system is that our system didn't need use online and all data will stored in a database and can print as a report. To get the data used in making this system, we used two elicitation techniques namely questionnaire and interview techniques. The advantage of this system is that our system does not need to be used online and all data will be stored in a database and can be printed as a report. Another benefit gained is that all teaching staff, both permanent teachers (PNS) or non-permanent teachers can use the system.

Keywords: Education, Information System, Student Performance, Waterfall Model.

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1. Introduction

Education is one important aspect in improving the quality of a nation, and also benchmark of the progress of a nation. But mostly academic services school in Indonesia is input manually. One service is the management of student grades by each subject teacher input student grades into a paper or file then given to homeroom teacher. The homeroom teacher processing it to be a school report card.

On this case will have any of several problems, including

- A teacher who accidentally lost student test results or undermine the file.
- The homeroom teacher who received the file also made the same mistake.
- Homeroom student is mistaken or forgot where his student report cards are stored. It caused by cabinets who stored school report cards are not organized neatly, and the number of student report cards in one cupboard.
- students undermine school report cards or damaged school report cards given by the homeroom teacher.

Therefore, we need a solution to eliminate the problems by designing an information system that can support the processing of student test results quickly, accurately and efficiently.

Ministry of Education and Culture (Kemdikbud) has built an integrated report card system, called E-Rapor. E-Rapor is evaluating student learning outcomes, both by educators and by the Education unit that has been integrated with Basic Education Data (Dapodik). Implementing e-Rapor is done in stages considering a large number of schools in Indonesia. The application is carried out at the junior high and high school levels especially in 2017 then followed by elementary schools that are planned to be implemented this year. Based on the above statement, it is possible that several schools in Indonesia experience several obstacles including:

- Less socialization or technical guidance (bimtek) regarding this e-Rapor on a school so that the process of evaluating student performance or learning is still done manually,
- internet connection where the school is located because e-Rapor is used online
- because e-Rapor is a system integrated with dapodik, only teachers who have NUPTK can fill the system. This becomes an obstacle for honorary teachers to enter grades because they do not have a NUPTK,
- the teacher's willingness to understand and use the e-Rapor system.

Base on that problems, we built a student performance evaluation information system in helping the processing of student learning outcomes. The system that we built applies the waterfall model approach

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with a display that makes it easy for users who are not yet familiar with technology. The system we made is a desktop-based information system where there is no need for an internet connection to use. All data entered will be automatically stored in the database so that the data will be safe even if the data file is damaged. This system just need installation in every computer to process student data.

2. Methods

2.1. Collecting data

- Questioner

Questioner is a method to collecting information that allows analysis to observe the attitudes, conviction, behaviors, and characteristics of some people in the organization who can be affect by the proposed system or existing system

- Wawancara

On these methods, we conducting direct interview by ask some question to homeroom student about how they processing their student grade to be student information.

2.2. SDLC model

Basically, waterfall model containing 5 steps, there are : analitic, design, implementation, trials, and maintain [1, 2]. Winston W. Royce proposed the first waterfall model in 1970 which describes in practice software engineerin [3]. Waterfall model's stage seen on Figure 1.

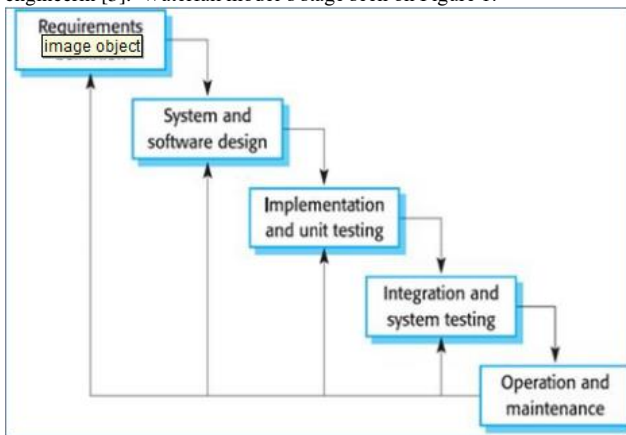


Figure 1. The Waterfall Model [4, 5]

- Analyst Stage : Initial stages of the waterfall model called software requirements specifications. In this stage produces 2 system requirements such as; functional requirements and non-functional requirements. We can interpret functional needs as features that owned by system being built. While non-functional requirements getting from several criteria including system limitations, reliability, scalability, testability, availability, maintainability, performance, and quality standards [1]
- Design Steps: Planning process and problems solving by defining plans be algorithm designs.

- Implementation Steps : Pouring requirement analysis and algorithm design into the programming language set by programmer. On this stage it also builds a database is also as a storage place for system input data.
- Trial Stage : In this stage, we finding errors that exist on the system that has been built. To maintain quality of system, we should carry a trial by a third party, where they have a relationship with customers and developers.
- Maintain Stage: modification on system process if needed. includensing system adaption to data environment of technological developments and changing base on customers requirement.

3. Hasil dan Pembahasan

We built this student performance measurement system to make processing of student grades became easier and faster to process for every student report card. User's just input score and attendance based on the category they need and system will automatically give an output in student report cards form.

3.1. Requirement

Requirement analysis of this system in which researchers conduct the elicitation process using observation and questionnaire techniques. Researcher conducting observation technique on score processing in the MTs Al-Azhar, while interview technique conducted by selecting some informant at MTs Al-Azhar including teachers and homeroom teachers. Based on these 2 techniques will be a result of functional requirements that seen in table 1.

Table 1. Kebutuhan fungsional.

Kode	Keterangan
KD1	User able to input student scores.
KD2	User able to input data student attendance.
KD3	User able to printing student report class.
KD4	User able to input data student.
KD5	User able to input data guru.
KD6	User able to input subject data.
KD7	User able to input data of classroom.
KD8	User able to input homeroom data
KD9	User able to input student score.
KD10	User able to input student attendance data.
KD11	System was built using Java programing

3.2. Design

On design stage, researchers using UML (Unified Modeling Language) design as a tool in making the design of this system. Java script and UML are excellent to abstract a system or software, that why we select them. OOP (Object Oriented Programming) most widely used by programmers is the java script programming. UML comprises 13 diagrams and divided

into 3 categories groups. The division of categories of groups can be seen in Figure 2.

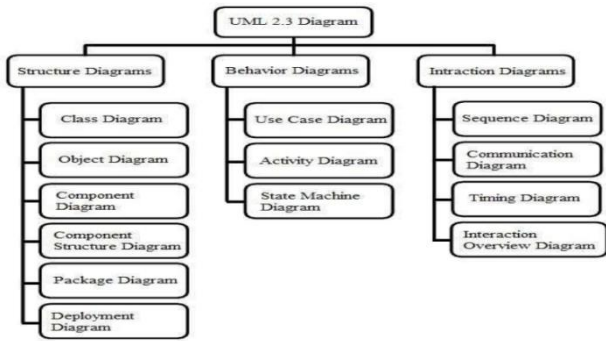


Figure 2. UML Diagram [6]

Based on 13 diagram variant jenis was labeled on UML, researcher using 2 diagram, that is use case diagram and class diagram during built this system. case diagram seen on figure 3.

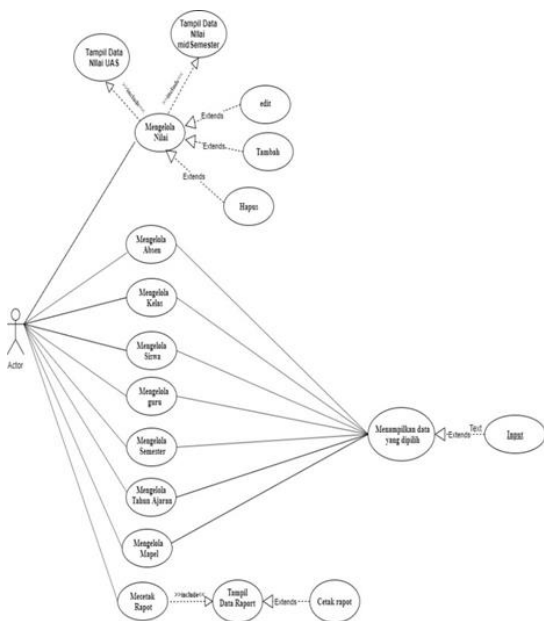


Figure 3. Use Case Diagram

In Figure 3 only available to one actor, the user. The user also acts as a system admin who has full access rights to the system. User able to manage values, manage absences, manage classes, manage students, manage teachers, manage homeroom teachers, manage subjects, and print reports. Print report in this case is student report card.

In addition to the use case diagram terable to also class diagram (able to be seen in Figure 4). Class diagrams are designed because they make it easy for programmers to convert designs into object-oriented programming languages. Class diagram illustrates the description and

structure of classes, packages, and objects along with their relationships with one another.

In designing the database design the researchers described it in CDM and PDM. CDM and PDM make it easy for programmers to generate databases built into database management system software directly (My SQL, Oracle, etc.).

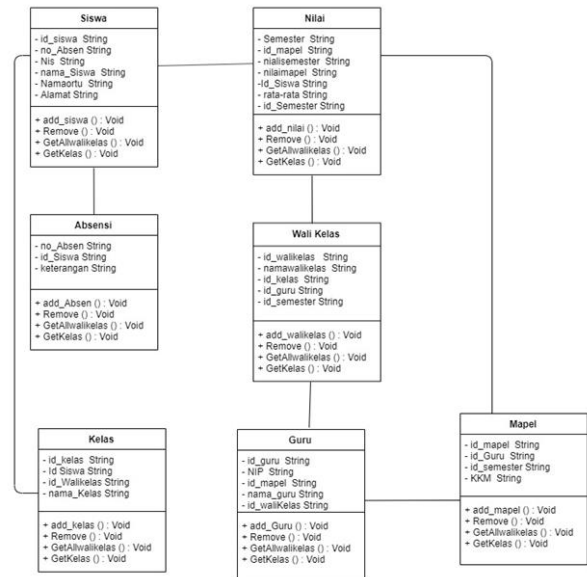


Figure 4. Class Diagram

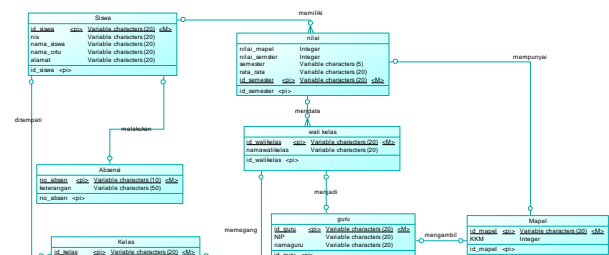


Figure 5. CDM

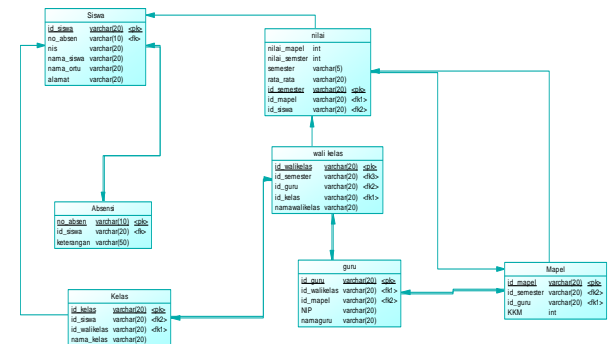


Figure 6. PDM

3.3. Implementation System

Development of student score measurement systems is divided into several forms including: homeroom form, teacher form, class form, student form, subject form, score form, presension form, and print report form.



Figure 7. (a) homeroom form, (b) teacher form, (c) class form,

(d) student form, (e) subject form, (f) score form, (g) presension form, and (h)print report form.

4. Kesimpulan

We have developed student performance measurement information system or using the waterfall model approach. The waterfall model has five main stages including system requirements, analysis, design, implementation, testing, maintenance. Besides these five stages, the other main process in the system development stage is the elicitation process, which is extracting data in search of we use whatever needs in building the system. The technique used in this study is the technique of distributing questionnaires and interview techniques.

With the approach we have used, users have been able to manage student performance in each class at Al-Azhar MTs. Teachers and homeroom teachers will have a student data bank and student grades stored in the system database and do not worry if they lose the manual file of student grades that they store manually..

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