Building information system based online quiz on messenger and website as backend

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Building information system based online quiz on messenger and website as backend

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Abstract. This study aims to design an online quiz information system that can facilitate teachers and learners. The type of research conducted by the author is descriptive research. In data collection method, writer use primary data source (interview, observation) and secondary data source (books, journal, tutorial, internet and others) as reference in research conducted. This research indicates that this system will certainly be very helpful for the process of online quiz implementation can run more safely, orderly, effective efficient funds.

1. Introduction
Currently Information and Communication Technology is growing rapidly, especially in the use of information systems, in education [1]. The application of information systems in educational systems is called e-learning, and in the future E-learning becomes an inevitable education trend for creating successful learning strategies [2]. One application of e-learning is to incorporate online education coding and information systems that are applied in detail so that they can illustrate their effectiveness and mechanism, as well as discuss the strengths and weaknesses of the proposed system. Quizzes conducted online can benefit various educational activities or other data collection tasks [3]. The underlying point that e-learning is considered a successful learning strategy because that plays an important role in an adaptive e-learning system is a learning style that refers to the way students love to learn. Various aspects of choosing learning styles in e-learning environments are the predictors of online style learning, a classification of learning styles that are automatically tailored to various learning style applications, so as to offer insight into developments, achievements, and other field issues [4]. There are four variables that have a significant influence on learning satisfaction, namely technology variables, educational content, motivation, and attitude [5].

The research conducted by Nur about one of the online quiz named The Quiz Rubix, is a quiz system that can perform multiple choice question checks, give quick results after answering some questions, and admin that can edit questions and answers, but the user must first register to the quiz main page, which then user data will be stored in database [6]. Likewise, with research conducted by Spichkova et all about the online system proposals to support transnational education (TNE) in Australia. The information system will be used on online modules and quizzes, and automatic help modules. This is done to ensure that students understand the potential problems associated with transnational education (TNE), providing assistance with general issues related to learning and living environment in Australia [7].
While research conducted by Li and Tsai on the use of information systems in the education world, found that students more often and longer see learning materials related to their formal classes (i.e., lecture slides and video lectures) than other learning materials (i.e., tasks shared and posted messages). Second, even though the students spend a lot of time looking at online learning materials, most do not use annotation tools. Third, each student exhibits a large variety of behaviors and is grouped into three behavioral patterns: "consistent students" who intensively use all learning materials, "intensive student-use slides" that intensively use lecture slides, and "under-use students" who rarely use any learning materials [8].

One of the implementation of e-learning in the learning process is through an online quiz, based on research conducted by Solomon on the effectiveness of e-learning learning at the University shows the results that the use of technology has a very high influence on the effectiveness of e-learning system at the University, accounted for 82% variance in effectiveness [9]. The most important thing that must be considered an educational institution in implementing e-learning, based on research conducted by Wong and Huang is the management of e-learning technology and e-learning service quality, because more and more users are satisfied with e-learning services, the more organizations in learning to be improved [10].

From some explanations and previous studies, most of them focus more on information systems in the education system. Therefore, this research is done to facilitate the teachers and students in doing quiz activity in class. But for the development of quiz online information system is a premise using prototype method. So that the information system will be used in a free messaging application called Line Messenger, because this is one of the most widely used free messaging applications. The advantages of an online quiz information system are that it saves teachers' time on checking quizzes, saves time on learning problems, students can quiz at anytime, anywhere does not need in class, and of course the financial benefits of paper savings.

2. Method
This research used descriptive research. The purpose of this descriptive study is to create a description, or painting systematically, factually and accurately about the facts, traits and relationships between the phenomena being investigated.

2.1. Method of collecting data
In data collection methods, the authors use primary data sources (interviews, observations) and secondary data sources (books, journals, tutorials, internet and others) as a reference in research conducted.

2.2. Systems approach and development method
The approach method used is an object-oriented approach visualized with UML. The tools used in this object-oriented method of Use Case, Use Case Scenario, Activity Diagram. The author uses the prototype software development method in the hope that the writer will be easier in designing and meeting the needs of the users and can be accepted and used in practice (Figure 1).
Figure 1. Prototype stages.

The advantage of the prototype stage is to make it easier to describe the specification of customer needs in detail, and customers are satisfied with the software system that is produced. In addition to having advantages, the prototype stage there are some banned, including customers often ask to add to their needs that must be implemented to the system so that developers have to add to what the system needed by customers. If the developer has agreed with the customer with the time specified developers usually pursue the target time so that the resulting system is not maximal whereas it should take longer than agreed.

2.3. Analyze tools
Unified Modeling Language (UML) is a "language" that has become the industry standard for visualizing, designing and documenting software systems. UML offers a standard for designing a system model by focusing on objects. UML defines various diagrams.

3. Results and discussion

3.1. System design and changes on the new system
System Design is made as a step to prepare the desired system implementation process, and to clearly describe the processes desired by the user. Temporary changes or additions to the new system are shown in Table 1.

| Old System                  | New System                                      |
|-----------------------------|--------------------------------------------------|
| Quizzes are held manually   | Quizzes are held using technology                |
| Quizzes are held in the classroom | Quizzes can be held anywhere                   |
| The teacher makes the quiz offline | The teacher makes the quiz online             |
| The student answers the quiz on the answer sheet | students answer questions about quiz through chat line messenger application |

3.2. New system overview
The description of the new system proposed in this system is to change the process from manual to computerization (online) so that the quiz execution process can be done well effectively and efficiently. In this system the teacher makes the problem online, quiz checking is also done quickly, and for students can take the quiz anywhere and anytime via Line Messenger application.
3.3. **Product design**

Product Design creates a system and builds a useful result for users of the system. It is necessary to design the procedures.

3.4. **Use case diagram**

Use Case Diagram System, which is one type of diagram in UML that describes the interaction between the system and the actor, use case diagram can also describe the type of interaction between system users with the system (Figure 2).

3.5. **System scenario**

Scenario of making online quiz is creating a scenario based on the use case diagram we have created before. After we make use cases about what the actors do to the system, we describe each step in making the question online (Table 2).

### Table 2. Quiz creation scenario.

| Use Case Name | Online quiz creation |
|---------------|----------------------|
| Primary Actor | Teacher              |
| Supporting Actor(s) | Teachers create online quiz |
| Summary | Teachers create online quiz |
| Pre-Condition | 1. Material has been completed  
2. All material has been explained |
| Normal Flow of Event | 1. Review material  
2. Prepare the question |
| Extensions | 1. Material has not been completed  
2. All material has not been explained |
| Post-Condition | Teachers have created the online quiz |

Online Quiz Implementation Scenario is to create a scenario to make use case about what the actors do to the system, in the implementation of online quiz (Table 3).

### Table 3. Quiz implementation scenario

| Use Case Name | Quiz online creation |
|---------------|----------------------|
| Primary Actor | Student              |
| Supporting Actor(s) | Students do the quiz |
| Summary | Students do the quiz |
| Pre-Condition | 1. Students are present in class  
2. Students follow the rules |
| Normal Flow of Event | 1. Students are present in the class  
2. Students do the quiz on the answer sheet  
3. Students collect the answer sheet |
| Extensions | 1. Students have not yet present in the class  
2. Students do not do the quiz  
3. Students do not collect the answer sheet |
| Post-Condition | Students have finished the quiz |
3.6. Activity diagram
Activity Diagram is a diagram showing the workflow from a starting point to the finish point of the decision detailing the many paths that exist in the development of events contained in the activity. Activity diagrams are useful for business models which used to create details of the processes involved in the business activities of online questioning and online quiz execution (Figure 2).

4. Conclusion
Quiz which held manually replaced with quiz held online. The quiz is still held in the class replaced with a quiz that can be done anywhere and anytime, the teacher makes the quiz manually replaced with the teacher make the quiz in online, the student answers the question quiz in the answer sheet replaced by the student to answer the question of quiz through chat application that is line messenger. On building this system, it will be very helpful for the implementation of online quiz process because it is more safely, orderly, effectively efficient. With the development of this system, education in Indonesia can grow positively and follow every development of information technology. This system can also help the quality of education in Indonesia to improved and so that the education in Indonesia can compete with the existing educational system in the world.

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