

# The Development of Web Mobile-Based National Exam Tryout toward Vocational High School

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**Abstract**— Knowing the development of Indonesian education, recently, the national exam accompanied by the falsehood process, makes the values of the national exam did not depict the real ability of the learners. In addition, the time of learning process is not enough for the learners so that the competency given by the teacher did not achieved yet. The national exam tryout has several weaknesses such as error on correction, the fee for the staffs, the fee for the corrector, the ink, photocopy and so forth. Furthermore, conventionally, the national exam tryout needs many papers so that it causes mounts of wastes in the school after the tryout process. Nowadays, many students have been using cellular phone and so do the vocational students, which have been completed by smartphone system. Considering this problem, the researchers develop media that can be accessed by using cellular phone to do the national exam tryout. This media can be accessed anywhere and anytime by the students, then it is called as MTOS. The development of this mobile web information system adapted from the development of waterfall method by Roger S. Pressman with the following steps: (1) the needs analysis system of the users; (2) the design is depicted by using Figure or frame; (3) the translation from the machine language that can be read by the computer that is called as coding; and (4) the last step is testing covering four stages, that are, media compatibility test, field tryout test, and blackbox test. The score gained by the students after doing the tryout will be used as the decision of the national standardized input in developing national exam for students of vocational high school. This can be used as the development of the MTOS application in order to give some benefit for the students, school, and of course educational department.

**Keywords**— *mobile web, tryout, MTOS, national exam*

## I. INTRODUCTION

The national education functions as developing the ability and shaping the character and also the national culture that has prestige to educate the nations. One of the developments of the ability is by implementing national exam according to Permendiknas No.3 2013 about graduation criteria for the students from a unit of education and the implementation of the examination and madrasah/education.

The equality and national exam explain that the activity of measuring the achievement of the students competency toward several certain subjects in a group of subject of science and technology to assess the achievement of national education standard. In national exam, the graduation standard can be functioned as distinguishing the failed- students and the passed-students. The criteria of the students in 2015 are if the mean score from all national exam achieved at least 5.5 (five comma five) and the score of each subject at least 4.0 (four comma zero).

In education, national exam is one of the evaluations that is issued by the government to measure the level of achievement of the educational goal to determine the students' graduation. Scrutinizing the fact of education in Indonesia, the present national exam accompanied by the falsehood process, the score gained did not reflect the real ability of the students. This is caused by only the school but also it is caused by the unconfident students with their work. This makes the students more believe in their friends' cheating rather than their own results or work. However, try out is carried out only several times in schools and some private courses.

In practice, the teacher needs lots of time to give some overall lessons. In a students' book that consist of several competencies, it is impossible to give all the materials to the students at one time in a school tutoring period. This makes lots of competencies do not achieved yet, but the national exam has been in plain sight. From this problem, the students can comprehend more about the materials directly and to do the items and also discuss with the teacher. From this point of view, the variation of the questions of national exam is needed. However, the explanation of the teacher that is 'round the bush' makes the students confused to grasp the material in the process of learning easily.

National exam tryout using paper or book is a conventional tryout that is carried out until now. Tryout using paper or book has several weaknesses such as error correction, the magnitude of the opportunity of the students who can do cheating, the fee of the staffs, the fee of the corrector, the ink, photocopy and so forth. In addition, it can add some paper waste after conducting tryout in the school.

To face the problems above, some schools conduct school tutoring and tryout to prepare national exam outside the classroom period. The school tutoring is conducted before and after the learning process period. In this school tutoring, the overall materials are given from the ten graders to twelve graders. Meanwhile, tryout is conducted only several times within the school tutoring process. The school tutoring given by the school authority needs definite time, it means that the students need time to pay more attention to the teachers in the classroom. Online national exam tryout is one of the media that can be used to prepare a national exam. Some students confessed that they had ever accessed online national exam tryout by using computer. The strength of using online national exam tryout is the time allocation is not limited and it can be accessed anytime and anywhere. The interaction between the students and the media can be done anytime, anywhere, and even anyone can assess it as long as they have an internet connection. In line with that, the students do not need to come to a certain place and spend their money for transportation, but they can study by themselves at home.

Nowadays, the internet access can be done through various electronic media, for example, cellular phone. According to the observation conducted in schools, 96% of 25 students, they have their own cellular phones that can be used to access internet and almost the students who have a cellular phone, had been used the internet connection and even they often used it. However, unfortunately, the internet access through a cellular phone is about entertainment websites such as social media. Therefore, from this point of view, the researchers want to do a research dealing with the factors above.

In this research, the media that is used is a cellular phone. A cellular phone is more popular among people because its small shape so that it is more portable. Besides, a cellular phone can be stored any materials dealing with the lessons. Another benefit of using a cellular phone is that it is portable at anytime and anywhere. By equipping the development of this product, hopefully, the vocational high school students can practice national exam whenever and wherever they want. Thus, this media is called as MTOS (Mobile Tryout Online SMK).

The strength in this MTOS is the students can choose any subjects they want because all the subjects that are given in national exam are available in this MTOS. In addition, the students can also see the direct score after they are doing the exercises and they will have feedbacks about the materials that are not understood yet. Moreover, MTOS also provides various kinds of exercises so that the students can practice various exercises.

According to the above matters, the title of this research is “The Development of Web Mobile-Based National Exam Tryout toward Vocational High School.”

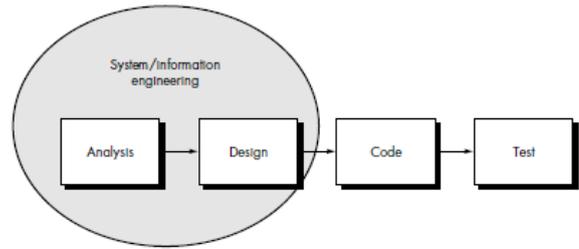


Fig. 1. Waterfall Model

II. METHOD

A. The Development Model

The development model used is MTOS that is a waterfall development model. The stages in developing waterfall model are started from analysis, design, coding, and testing. The waterfall model that is used in this development system is presented in the form of a diagram in Figure 1.

B. The Development Procedures

1) The Stage of Analysis

In this stage, the collection of the needs is intensified toward the software users, so that it is obtained a performance, behavior, and interface needed. In this stage, the developer and the users define the format of the software and identify the system needs that will be made cooperatively. The data collection is conducted by using interview method with the software users.

Based on the interview results with several national exam teachers and the twelve graders in several vocational high schools, it is known that the problems rose as the following: the students are more comprehend the material of ten graders and eleven graders by giving some exercises and some discussion rather than the repetition of the materials by the teachers, the students are happier by knowing the score obtained directly and knowing their mistakes in doing exercises so that the students can evaluate themselves, and in the period of the school tutoring process, the time needed by the teachers is often limited.

2) The Stage of Designing

The product design must be formed in the form of Figure or frame, so that it can be used as a standard to assess and make it [1][2]. The design process is a process of translating the need into a representation of software before it is began coding. The representation of software is in the form of Diagram Arus Data (DFD) and the interface design.

DFD is used for describing a system related to the process, the current of data, and storage. DFD level 0 (context diagram) as presented in Figure 2.





Fig. 5. Selection page of the subjects

In Figure 5, the students can select the subjects they want. The subjects consist of four courses registered in national exam.

After the students select the subjects, they will be guided to exercises page. The example of exercises page for the students can be seen in Figure 6.

After finishing doing the exercises, the students will be guided to the evaluation page as Figure 7. In Figure 7, the students can see the score obtained and the evaluation from the system about the percentage of the student's materials mastery.

The results of compatibility testing and the speed access of MTOS are showed in Figure 8. The result of tryout from MobiReady showed that the overall score from MTOS are good and it can be displayed in a cellular phone that must fulfill minimal specification.

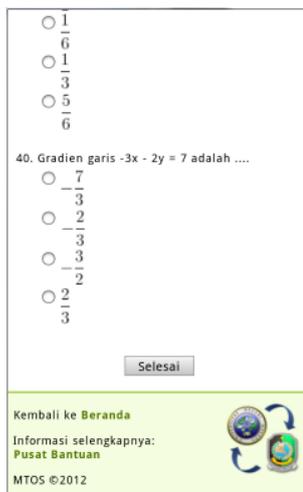


Fig. 6. Tryout page



Fig. 7. Evaluation page



Fig. 8. Result of MTOS from MobyReady

From Figure 8, it can be analyzed as the following: (1) Score 3.15 from the maximum score 5 showed that MTOS has been proven that is suitable and almost all cellular phones have minimal specification that can open these pages perfectly, (2) The page size that showed the score 27.70kb showed that the page size of MTOS is not too large. This can affect the time of accessing fast, (3) MTOS access speed estimated by using standard GPRS connection is 8.72 seconds.

The result of compatibility tryout of MTOS showed in Figure 4.7. The result of tryout from w3c showed that the overall score of MTOS are good.

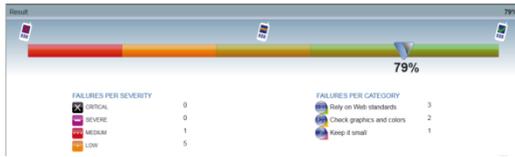


Fig. 9. Result of MTOS from W3C

From Figure 9, it can be seen that the result of MTOS percentage is 79%. It means that MTOS is suitable to use in all cellular phone having minimal specification.

#### IV. CONCLUSION

This research and development have been produced a medium of national exam tryout for vocational high school students that can be accessed via mobile web and it is called as MTOS. MTOS has a function for administrator. This function will lead to the pages and the function of the users' right. Moreover, MTOS can be used by administrator to manage blueprint of exercises, exercises, and the answer for four national exam practices. The system used in MTOS is random system for exercises and answer texts, so that the students can do lots of exercise units that have different questions whenever the students access it.

In order this media usage compatible with our hope, then it is suggested for the users to pay more attention toward several things in the following: (a) Using mobile device such as a cellular phone or smartphone, (b) The screen resolution of the cellular phone at least has the width 240 pixel, (c) A cellular phone has GPRS feature and web browser, (d) The browser must support for HTML 4 and above, CSS 2 and above, and JavaScript.

For MTOS usage in the broader scale, it is necessary to concern on several things as presented below:(a)It needs

socialization about the steps of using MTOS, either for administrator or for students,(b)It needs server with high stability level in order to avoid technical error when the users access it, (c)It needs a cellular phone with good specification for MTOS.

There are also some weaknesses of MTOS such as: (1) MTOS is only be accessed by using a cellular phone that has internet support and web browser, (2) the browser in cellular phone that is not compatible with java script cannot display timer when the students do the exercises, and (3) MTOS cannot access if it is no connection.

According to the tryout, there are some suggestions to develop further MTOS, they are in the following:

(a)Today, the only device that can be used to access MTOS is a cellular phone, but later on, some devices such as desktop, notebook, and the others can be used to access MTOS, (b)The additional login for the students is meant to make the administrator can evaluate the overall result score of the students, Score obtained from the students after they did tryout exercises will be used as the input of the national standard in making national exam for vocational high school students.

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