

Development Of Web-Based Information System As A Media For Distribution Of Information On Vocational School Production Units To The Community

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| ARTICLE INFO | ABSTRACT |
|--|---|
| <p>Article history:</p> <p>Received Dec 22, 2020 Revised Jan 12, 2021 Accepted Jan 28, 2021</p> | <p>The production unit in SMK is a means of learning and entrepreneurship for students. However, the production unit in SMK is currently still facing problems related to the marketing of products or services. This research was conducted with the objectives to: (1) assist SMK in disseminating production unit information to the general public online using a web-based SMK production unit information system. The results of this study are: (1) a web-based SMK production unit information system to help disseminate information on SMK production units to the wider community. the system has met the ISO/IEC 25010 software quality standard on usability aspect of 84.24% (very feasible), functional suitability aspect of 1 (all features can be implemented), reliability aspect of successful session 100%, successful pages 100%, and 100% successful hits (exceeding Telcordia standards), PageSpeed efficiency aspect is 93.33% (Grade A) Yslow is 90.16% (Grade A) page load time is 3.06, and maintainability aspect has Maintainability value (2) the system has met the ISO/IEC 25010 software quality standard on usability aspect of 84.24% (very feasible), functional suitability aspect of 1 (all features can be implemented), reliability aspect of successful session 100%, successful pages 100%, and 100% successful hits (exceeding Telcordia standards), PageSpeed efficiency aspect is 93.33% (Grade A) Yslow is 90.16% (Grade A), and maintainability aspect has Maintainability value. Index 90.72 (easy to maintain). a web-based SMK production unit information system to help disseminate information on SMK production units to the wider community. the system has met the ISO/IEC 25010 software quality standard on usability aspect of 84.24% (very feasible), functional suitability aspect of 1 (all features can be implemented), reliability aspect of successful session 100%, successful pages 100%, and 100% successful hits (exceeding Telcordia standards), PageSpeed efficiency aspect is 93.33% (Grade A) Yslow is 90.16% (Grade A) page load time is 3.06 seconds (less than 10 seconds), and maintainability aspect has Maintainability value. Index 90.72 (easy to maintain).</p> |
| <p>Keywords:</p> <p>Development; information Systems; production units; high school; Research and Development.</p> | <p><i>This is an open access article under the CC BY-NC license.</i></p>  |
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1. INTRODUCTION

Production units in SMK are one of the learning and entrepreneurship facilities for students because they are trained to maintain the continuity of production unit activities through marketing development and maintaining consumer trust.(Ultimate, 2011). Production unit activities produce a product or service that has economic value, so that managers and implementers receive rewards. The production unit is a facility that can be optimized for vocational learning in Vocational High Schools so as to allow students to have direct experience in activities as they are in industry (Siswanto, 2015).

However, the reality on the ground is that many production units are closed or not running so that the production units that should be a source of learning cannot be used. Of the 32 SMKs in Yogyakarta City, only 17 SMKs or 53.12% have production units, while 15 SMKs or 46.87% do not yet have production units or the existing production units have closed.(Yuliansah & Rasyid, 2015). There are many problems in implementing the activities of the production unit, one of which is a marketing problem. The production unit of SMK is currently still having problems related to the marketing of products or services. The reasons for the problem of marketing production units in SMK are less strategic places, difficulty in marketing products or services, and limited infrastructure(Mardiana, Aliman, & Juarsa, nd)

Production unit activities are one of the direct student learning activities in entrepreneurship because students gain experience on how to deal with customers, work on orders, to produce ordered products. Public awareness has an impact on the sustainability of production unit activities, because when there are no orders, the production unit activities cannot run so that students cannot learn. So far, the production unit at SMK Muhammadiyah 2 Klaten Utara has disseminated information about the production unit by making banners that are installed in front of the school as well as verbally from teachers and students. In addition, the production unit at SMK Muhammadiyah 2 Klaten Utara has also not disseminated information on production units online(Ubaidillah, 2017).

Based on a survey by APJII (Association of Indonesian Internet Service Providers) in 2017, internet users in Indonesia amounted to 143.26 million people or equivalent to 54.68% of Indonesia's population of 262 million people and 8.12% used internet media to sell goods. . With the large number of internet users in Indonesia, it is possible to disseminate information on production units to the public directly anywhere and anytime. One platform that uses the internet is a website. In addition, the website platform can be run on various devices, namely mobile and desktop(Mutia & LEONARD, 2015). Therefore, we need a media that can help disseminate product or service information, addresses and contacts of the SMK production unit to the public online. The web-based production unit information system is expected to be able to disseminate production unit information to the public, so as to maintain the continuity of production unit activities(Meydianawathi, Wiagustini, & Riana, 2014).

So that the software developed has good quality and does not have technical or non-technical problems when used by users, testing is needed to ensure the quality of the software. In this study, ISO/IEC 25010 is used as a testing standard for a web-based SMK production unit information system. ISO/IEC 25010 was chosen because it is one of the international software testing standards and is the result of the development of the previous software testing standard, namely ISO/IEC 9126 (Gunawan & Triantoro, 2017).

2. METHOD

2.1 Research methods

The research method used in this study is the Research and Development (R&D) method. The product developed is a web-based SMK production unit information system which aims to help disseminate information on the SMK production unit to the wider community online. The users of this information system are the managers of the SMK production unit and the community. Therefore, to create a product that suits user needs, in developing this information system, the researcher uses the Rational Unified Process (RUP) software development model.

2.2 Method of Collecting Data

a. Interview

Interview is a direct data collection technique which is done through face-to-face and direct question and answer between researcher and resource person. Interviews in this study were conducted to collect user system requirements. Interviews were conducted with teachers who manage the production unit at SMK Muhammadiyah 2 Klaten Utara and the community as recipients of information.

b. Observation

Observation is used to collect data in testing reliability, performance efficiency, and maintainability. Reliability testing observes the stress testing process using the WAPT application. Performance efficiency testing observes the page load measurement process using the GTMetrix application. While the maintainability test observes the lines of code using the PHPMetrics application.

c. Questionnaire

Questionnaire is an indirect data collection technique which is carried out using an instrument in the form of a questionnaire. The questionnaire contains questions or statements that must be answered by the respondent. Data collection using a questionnaire is used in testing usability and functional suitability.

3. RESULTS AND DISCUSSIONS

3.1 Results

This study aims to develop a web-based information system as an information medium to help SMK disseminate information on production units to the public online. The development model used in this research is the Rational Unified Process (RUP) model with 1 iteration. The Rational Unified Process (RUP) has 4 stages, namely the inception stage, the elaboration stage, the construction stage, and the transition stage. As well as ensuring the quality of the software developed by testing using the ISO 25010 software testing standard.

a. Usability

Testing the usability aspect of the web-based SMK production unit information system using a USE Questionnaire consisting of 30 which is divided into 3 parts, namely usefulness, satisfaction, and ease of use, assessed using a Likert Scale which has a score of 1 to 5 which has a choice of answers, namely Strongly No. Agree, Disagree, Doubtful, Agree, and Strongly Agree. The questionnaire was given to 26 people as respondents and also users of the web-based SMK production unit information system. Based on the test results, the total score of respondents was 3412. The total score of the respondents was used to calculate the percentage eligibility with the following formula:

$$\text{Persentase Kelayakan(\%)} = \frac{3412}{4050} \times 100\% = 84.24\%$$

From the results of the calculation of the percentage value of usability feasibility obtained by 84.24%. From the feasibility percentage value, it can be concluded that the web-based SMK production unit information system meets usability standards and is declared Very Eligible because it enters the feasibility percentage conversion value with a value range of 81% to 100%.

b. functional suitability

testing the functional suitability aspect of the web-based SMK production unit information system was carried out by an expert validator consisting of 2 experts in the field of web

development and 1 teacher as the admin of this system. The list of experts can be seen in Table 1.

Table 1.
List of validators

| No. | Name | Work | agency |
|-----|------------------------|---------------|---------------------------------|
| 1. | Hilarius Wira, SPd | Web Developer | Wongselo.com |
| 2. | Ilham Anasrulloh | UX Designer | PT. Property Technology Mama |
| 3. | Angga Chrisna Widyanto | Teacher | SMK Muhammadiyah 2 North Klaten |

The results of testing the functional suitability aspects of the 3 validators can be seen in table 2 below:

Table 2.
The results of testing aspects of functional suitability

| The results of testing aspects of functional usability | | | Results | |
|--|----------------------|---|---------|------|
| No | Function | description | Succeed | Fail |
| Visitor Page | | | | |
| 1. | Showing news | The function displays news of production unit activities correctly. | 3 | |
| 2. | Showing Testimony | The function displays the testimony of the production unit correctly. | 3 | |
| 3. | Showing Product | The function displays the product of the production unit correctly. | 3 | |
| 4. | Show product details | Function displays description the product of the production unit that is selected correctly. | 3 | |
| 5. | penca an product | The function to search for production unit products based on keywords is running correctly. | 3 | |
| 6. | Showing Profile | The function displays the profile of the production unit correctly. | 3 | |
| 7. | Navigation | The function displays the navigation route to the location of the production unit correctly. | 3 | |
| Admin Page | | | | |
| 8. | Login | Go to page function admin is running properly. | 3 | |
| 9. | Managin g news | The functions of creating, viewing, modifying, and deleting production unit activity data are running correctly. | 3 | |
| 10. | Mengela Testimoi | The functions of creating, viewing, modifying, and deleting production unit testimonial data are running correctly. | 3 | |
| 11. | Manage Products | Functions of creating, viewing, modifying, and deleting product data of current production units correctly. | 3 | |
| 12. | Manage Profile | Functions of creating, viewing, modifying and deleting production unit profile data are running correctly. | 3 | |
| 13. | Logout | Exit page function admin is running properly. | 3 | |

From the results of the functional suitability test score, it is then calculated using the Feature Completeness formula with the following formula:

$$X = \frac{I}{P} \rightarrow X = \frac{13}{13} \rightarrow X = 1$$

Description:

X = Functional suitability.

- I = Number of successfully implemented functions.
 P = Number of functions designed.

From the calculation of the Feature Completeness formula which has a value of 1, it can be concluded that the system has met the functional suitability standard because all the designed features can be implemented.

c. Reliability

Testing the reliability of the web-based SMK production unit information system using the WAPT (Web Application Load, Stress and Performance) application. The test is carried out using the stress testing method for 10 minutes with a user simulation of 20. The reliability testing steps can be seen in Appendix 12 while the reliability test results can be seen in the following figure:

Test execution parameters:

Test status: finished
 Test started at: 4/5/2019 2:40:46 PM
 Scenario name:
 Test run comment:
 Test executed by: Flippy Mactavis (FLIPPY)
 Test executed on: FLIPPY
 Test duration: 0:10:00

Test result: SUCCESS

Pass/Fail Criteria

| Name | Result |
|-------------------------------------|---------|
| Session error rate for each profile | SUCCESS |

Summary

| Profile | Successful sessions | Failed sessions | Successful pages | Failed pages | Successful hits | Failed hits | Other errors |
|---------|---------------------|-----------------|------------------|--------------|-----------------|-------------|--------------|
| test | 181 | 0 | 2852 | 0 | 12451 | 0 | 0 |

Figure 1. Reliability test results

From the reliability test results above, we can get a summary of successful sessions 181, failed sessions 0, successful pages 2852, failed pages 0, successful hits 12451, and failed hits 0. If the percentage is done, it will produce a successful session value of 100%, successful pages 100 %, and successful hits 100%. From this percentage, it can be concluded that the system has met the reliability standard because the percentage of the test value is more than the Telcordia standard which is 95%.

d. performance efficiency

Testing the performance efficiency of the web-based SMK production unit information system using the GTMetrix application. The steps for testing performance efficiency can be seen in Appendix 13, while the results for testing performance efficiency can be seen in the following table 3.

Table 3.
Performance efficiency test results

| No. | Page Name | Test result | | |
|---------|-----------------|-------------|-------|------|
| | | PageSpeed | Yslow | Time |
| 1. | News | 95 | 89 | 4.0 |
| 2. | Product | 95 | 89 | 3.8 |
| 3. | Product Details | 89 | 94 | 2.4 |
| 4. | Search | 96 | 94 | 2.2 |
| 5. | Testimonials | 96 | 95 | 1.6 |
| 6. | Profile | 89 | 80 | 4.4 |
| Average | | 93.33 | 90.16 | 3.06 |

Based on the calculation of the average performance efficiency test results using the GTMetrix application, the average PageSpeed results are 93.33% (Grade A), Yslow is 90.16% (Grade A), and page load time is 3.06 seconds.

e. Maintainability

Testing the maintainability of the web-based SMK production unit information system using the PHPMetrics application. The maintainability test steps can be seen in Appendix 14 while the maintainability test results can be seen in Figure 42 below.



Figure 2. Maintainability test results

3.2 Discussion

The information system developed is a web-based SMK production unit information system that aims to help disseminate information on SMK production units to the public online. A web-based SMK production unit information system can disseminate information about news, products or services, product or service details, testimonials, profiles, and navigation of SMK production units.

The stages that have been carried out in the development of this information system begin with the inception stage which focuses on gathering user needs. Then the elaboration stage which focuses on making the system design. The next stage is the construction phase which focuses on implementing the designs that have been made. And finally the transition phase which focuses on software testing based on ISO/IEC 25010 and tool delivery.

The following are the results of tests that have been carried out using the ISO/IEC 25010 software testing standard. The tests cover 5 aspects consisting of aspects of usability, functional suitability, reliability, performance efficiency, and maintainability.

4. CONCLUSION

This research produces an information system to help disseminate information on the production unit of SMK to the public. This system is built using the CodeIgniter 3 framework and follows the RUP (Rational Unified Process) software development method. This information system has 2 levels of users, namely admin and visitors. The web-based SMK production unit information system has been tested for feasibility using the ISO/IEC 25010 standard which includes 5 aspects, namely usability, functional suitability, reliability, performance efficiency, and maintainability. Based on the test results, the web-based SMK production unit information system meets the feasibility of all aspects tested with the results of a usability value of 84.24% (very feasible), a functional suitability value of 1 (all features can be implemented),

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