

Conference Paper

Testing of the Monitoring and Evaluation System for Subsidized Fertilizer using the Black Box Method

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ABSTRACT

Evaluation and monitoring of subsidized fertilizer is needed by the Food and Agriculture Security Service to control the distribution of subsidized fertilizer. To make it easier to monitor fertilizer distribution, an information system was created that can control and monitor fertilizer supplies and distribution. At the system needs analysis stage there are several procedures related to users in the system including farmers, distributors, extension workers, and the department itself. The evaluation and monitoring system was built using the waterfall method with needs analysis, design, implementation, testing, and maintenance. At the trial stage, system testing will be carried out using the black box testing method. Testing using black box testing aims to find out errors that occur when the system is used by the end user. From the results of testing using the black box method, it was found that the functionality of the system was running well.

Keywords: System, testing, black box

Introduction

Software testing is a program testing process that is intended to find errors in the software. Software testing is important for conducting software quality tests to reduce the opportunity for errors to occur. Testing is very necessary for information systems to ensure the application developed meets technical requirements before being handed over to users (Febrian et al, 2020). An important role in an information system, with this that, defects or errors that will appear on the device can be identified soft. Software that is defective or contains mistakes can produce results that do not match expectations and can cause large losses (Saifudin & Yulianti, 2020). With software testing, it is hoped that it can minimize errors and defects in software and measure the quality of the software (Kurniawan, 2017). So, the testing process is one of the important processes in software development (Ningrum et al., 2019).

The software to be tested is a subsidized fertilizer monitoring and evaluation system. This system is the system used by the Bojonegoro Food and Agriculture Security Service in monitoring the distribution of subsidized fertilizer in the Bojonegoro Regency. In this system, there are 4 users, namely admin, extension agent, farmer, and fertilizer distributor kiosk.

The method used to test the quality of this application is the black box method. The software testing that is often used is black box testing [Safitri & Pramudita, 2018]. Black box testing is a type of testing method that treats software whose internal performance is unknown. So, the tester views the software like a black box where it is not very important to see the contents but only needs to be subjected to a testing process on outside of the system [Salamah & Khasanah, 2017]. The black box testing technique will show the test results in the form of a table with fields for test results and

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conclusions. the results can be seen (Cahyani et al., 2016). The purpose of testing is to ensure that the system is produced according to needs and appropriate for use (Arwaz et al., 2019).

Material and Methods

The method used in developing this software uses the waterfall model (Sukamto & Shalahuddin, 2011) which is divided into four stages, namely: 1) Software Requirements Analysis is a process of gathering requirements to specify software requirements so that they can be understood according to user needs. 2) Software design is a multi-step process that focuses on the design of creating a software program including data structures, software architecture, interface representation, and coding procedures. This stage translates software requirements from the requirements analysis stage to a design representation so that it can be implemented into a program at the next stage. 3) Program code creation must be translated into a software program. The result of this stage is a computer program by the design that was created at the design stage. 4) Testing focuses on the software logically and functionally and ensures that all parts have been tested. This is done to minimize errors and ensure that the output produced is as desired.

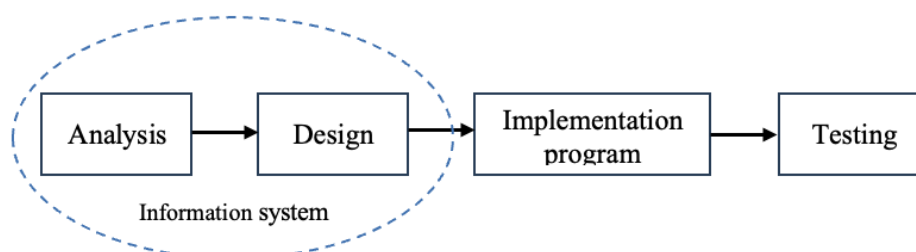


Figure 1. Illustration waterfall model

This research will focus on discussing the testing stage. Testing is an activity where a system or component is executed under certain conditions, the results are observed or recorded and then evaluated based on several aspects of the system or component (Galín, 2018). Black Box Testing also called Functional Testing, this term refers to software that is treated as a black box. Black Box(functionality) testing tests for bugs based solely on software malfunctions that are revealed in the form of incorrect output [Galín, 2018]. Black Box Testing tends to find the following things, namely 1) Incorrect or non-existent functions. 2) Interface errors. 3) Errors in data structures and database access. 4) Performance errors. 5) Initialization and termination errors (Mustaqbal et al., 2015).

Results and Discussion

User requirement

User requirements for the subsidized fertilizer monitoring and evaluation system consist of 4 users, namely 1) Administrator: Can manage the entire system. in this case, the admin will be handled by the Team from DKPP Bojonegoro. 2) Extension Officer: a person assigned by DKPP Bojonegoro to monitor and validate data 3) Distribution Kiosk: users with this user can manage fertilizer stocks 4) Farmer Group: this user can purchase fertilizer. With the existence of a monitoring and evaluation system for subsidized fertilizer, it can prevent misuse of subsidized fertilizer in the Bojonegoro district.

System testing

System testing is a very important thing aimed at finding errors in the software to be tested. By using the black box testing method the system will be better and errors can be minimized. The following is the system testing process:

1. Testing the Login Page can be seen in Table 1:

Table 1. Testing the login page

User	Scenario Testing	Expected Result	Test Result
Administrator, Extension Officer, Distribution Kiosk, Farmer Group	Leaving login credentials empty	The system should reject the login attempt and display a message prompting the user to fill in the fields. "Please Fill out this Field."	Results as expected
	Entering valid login credentials	The system should grant access and redirect to the main page.	Results as expected
	Entering incorrect login credentials	The system should reject the login attempt and display a message indicating a failed login."Login Failed. Please Check Again."	Results as expected

From the system testing results, the login process to the system appears to be functioning correctly. The login interface for this system can be seen in Figure 2.

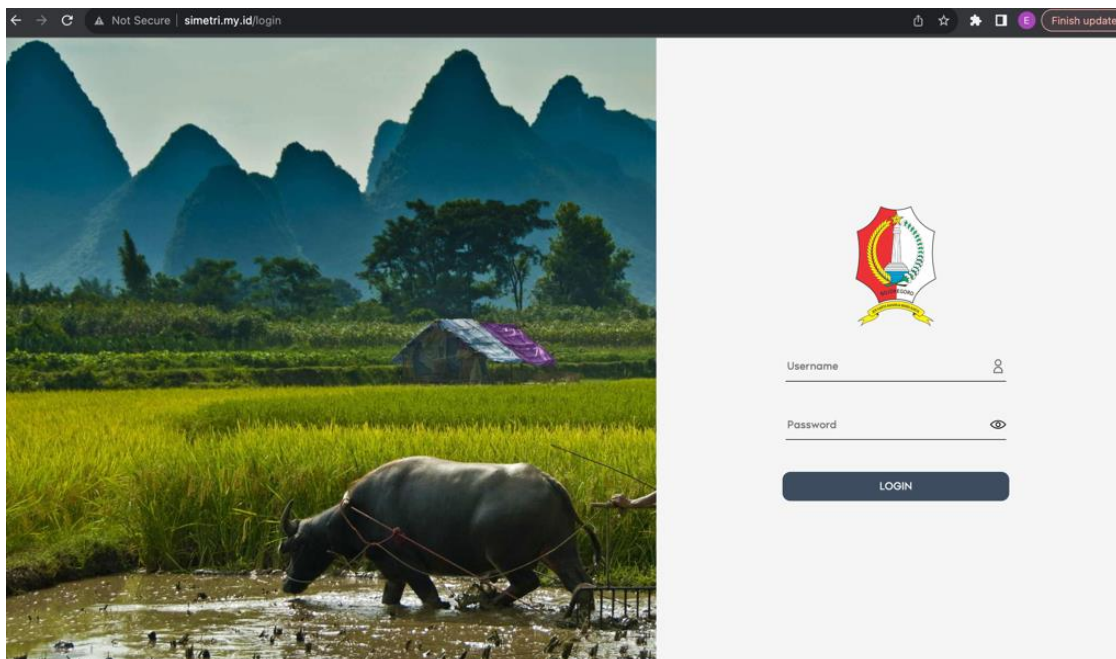


Figure 2. The initial system interface

- Testing the use of the save, delete, and update functions shown in Table 2:

Table 2. Testing the use of the save, delete, and update functions

User	Scenario Testing	Expected Result	Test Result
Administrator	Insert and save data of farmers, shops, and advisors into the system.	The system and database can store data.	Results as expected
	The administrator can delete farmer, distributor shop, and advisor data.	The system and database can store data.	Results as expected
	The administrator can update farmer, distributor shop, and advisor data.	The system and database can store data.	Results as expected
Extension Officer	Advisor can validate farmer and shop data.	The system and database can store data.	Results as expected
Distribution Kiosk	The distribution shop can store fertilizer stock.	The system and database can store data.	Results as expected
Farmer Group	The farmer group can make purchases by entering the requested fertilizer data.	The system and database can store data.	Results as expected

An example of adding and saving data in the administrator's interface can be seen in Figure 2.

The figure consists of two screenshots. The top screenshot shows a form titled 'Halaman Penyuluh' with a 'Kembali' button. The form contains four input fields: 'NIK*' (1234567890), 'Nama Penyuluh*' (Alif Maulana), 'Alamat Penyuluh*' (Desa kedungadem RT.22 RW.01), and 'Telepon Penyuluh*' (086737462732). A 'Simpan' button is located at the bottom left of the form. The bottom screenshot shows a table with the following data:

No	Aksi	NIK	Nama Penyuluh	Alamat Penyuluh	Telepon Penyuluh
1	[edit] [delete]	1234567890	Alif Maulana	Desa kedungadem RT.22 RW.01	086737462732
2	[edit] [delete]	6524286550129557	Nasab Bahuraksa Natas	Psir, Bahagia No. 499, Tangerang 50029, DKI	(+62) 963 9481 114
3	[edit] [delete]	0891227333960282	Cakrajaya Natas	Ds. Antapani Lama No. 43, Administrasi Jakarta Utara 50741, SulSel	(+62) 387 6060 1185
4	[edit] [delete]	0308848948153748	Nyaman Septono	Jln. P.M. Said No. 451, Gorontalo 24771, KalTim	0820 335 987

Figure 2. Add and save data

3. Testing of the Logout process can be seen in Table 3

Table 3. Testing the logout page

User	Scenario Testing	Expected Result	Test Result
Administrator, Extension Of-ficer, Distributor Kiosk, Farmer Group	Exit the main page when logged in	The system receives log-out access then the user exits the system to the login page	Results as expected

Conclusion

Based on the results of the tests that have been carried out, it can be concluded that designing an information system using the System Development Life Cycle method with a waterfall model, which has four general stages, namely analysis, design, programming, and testing can be used effectively in designing a monitoring and evaluation system for subsidized fertilizers. The monitoring and evaluation system that has been designed can be tested by implementing black box testing. The results of black box testing are to see that the input from the test is what is expected. In this research, it can be seen that what is expected from the system is what is produced from the system being tested. The results of the tests that have been carried out are valid and the web-based subsidized fertilizer monitoring and evaluation system can be used and run well.

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References

- Arwaz, A. A., Putra, K., Putra, R., Kusumawijaya, T., & Saifudin, A. (2019). Pengujian black box pada aplikasi sistem seleksi pemenang tender menggunakan teknik equivalence partitions. *Jurnal Teknologi Sistem Informasi dan Aplikasi*, 2(4), 130. doi:10.32493/jtsi.v2i4.3708
- Cahyani, N. M., Indriyanto, E., & Masripah, S. (2016). Uji validitas dan reabilitas terhadap implementasi aplikasi penjualan dan pembelian. *Jurnal Information System For Educators And Professionals*, 1(1), 21–34.
- Febrian, V., Ramadhan, M. R., Faisal, M., & Saifudin, A. (2020). Pengujian pada Aplikasi Penggajian Pegawai dengan menggunakan Metode Blackbox. *Jurnal Informatika Universitas Pamulang*, 5(1), 61-66.
- Galin D. (2018). *Software quality concepts and practice (1st ed)*. New Jersey: Wiley
- Kurniawan, T. A. (2017). Pengujian perangkat lunak. pengujian struktur program dengan pengujian jalur dasar (Basic path testing): Teori dan aplikasi, jurnal *EECCIS (Electrics, Electronics, Communications, Controls, Informatics, Systems)*, 1(1), pp. 29–32. <https://doi.org/10.21776/jeccis.v1i1.357>
- Mustaqbal, M. S., Firdaus, R. F., & Rahmadi, H. (2015). Studi kasus: Aplikasi Prediksi Kelulusan SNMPTN. *J. Ilm. Teknol. Inf. Terap.*, 1, 31 – 36
- Ningrum, F. C., Suherman, D., Aryanti, S., Prasetya, H. A., & Saifudin, A. (2019). Pengujian black box pada aplikasi sistem seleksi sales terbaik menggunakan teknik equivalence partitions. *Jurnal Informatika Universitas Pamulang*, 4(4), 125-130.
- Safitri, N., & Pramudita, R. (2018). Pengujian Black Box Menggunakan Metode Cause Effect Relationship Testing. *Information System for Educators and Professionals: Journal of Information System*, 3(1), 101 – 110.
- Salamah, U., & Khasanah, F. N. (2017). Pengujian sistem informasi penjualan undangan pernikahan online berbasis web menggunakan black box testing. *Inf. Manag. Educ. Prof.*, 2, 35– 44
- Saifudin, A., & Yulianti, Y. (2020). Dimensional reduction on cross project defect prediction. *Journal of Physics: Conference Series*, 1477, 022030. Tangerang: IOP Publishing. doi:10.1088/1742-6596/1477/3/032011
- Sukamto, R. A., & Shalahuddin, M. (2011). *Modul pembelajaran rekayasa per angkat lunak terstruktur dan berorientasi obyek*. 160 p.