

Analysis of Basic Testing Using Smoke Testing in Asset Inventory Information Systems

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ABSTRACT

The creation or development of a system must go through a testing phase with the aim that before the system is implemented by the user, bugs or errors can be detected at the start. The PGRI Madiun University Asset Inventory and Documentation Unit (UIAD) is currently building and developing an information system for managing inventory, asset and document data. So far, data management still uses manual recording on paper forms. This creates a problem of inconsistency between data in the field and data in the unit. To improve the quality of the UIAD information system so that it is more optimal, it is necessary to carry out basic testing with smoke testing to ensure that the basic features function properly. The aim of this research is to test the basic functionalities of the UIAD information system with smoke testing to provide recommendations for improvements in order to improve the quality of the UIAD information system. Testing is carried out manually with 3 types of test cases, namely login test case, master test case and asset test case. The test results show that the login test case passed 100%, the master test case passed 100%, and the asset test case passed 80%. Based on the test results, it is very important to carry out smoke testing on the basic functions of the system before the system is used so that bugs or errors can be found so that corrective action can be taken more quickly.

Keywords: smoke testing; test case; bug; errors; information system

1. INTRODUCTION

Data speed and accuracy are currently the main priority in meeting data needs. Creating an information system is one solution for managing data quickly and reliably. The creation or development of a system must go through a testing phase with the intention that before the system is implemented by the user, the system is in accordance with the functions of the unit (Rosmiati, 2021). If a system does not go through the testing stages, bugs or errors cannot be detected at the start. Any bugs or errors that arise can cause significant disruption, both from an operational and security perspective (Abdillah, Hermawan, Hermawansyah, & Adkha, 2024). Finding bugs and errors during the testing stage will help the process of improving system functions so as to avoid ongoing system defects and improve system quality (Permatasari, Adhania, Putri, & Nursari, 2023). System testing is an evaluation step towards the quality of the system capabilities being developed so that the system can be maintained (Muhammad Jibril, Zulrahmadi, & 3Muhammad Amin, 2024). The software testing process can be done manually or automated with the help of testing software (Nurrahmania & Cahyono, 2023). Manual testing is a type of testing without the assistance of any automation device whose aim is to identify defects in the software (Wijaya & Wira Harjanti, 2021).

The Asset Inventory and Documentation Unit (UIAD) is one of the bureaus at Universitas PGRI Madiun which is currently building and developing an information system for managing inventory, asset and document data. So far, data management still uses manual recording on paper forms. This creates a problem of inconsistency between data in the field and data on the unit. Data in the field with data on different units can cause problems, including inappropriate inventory amounts, undetected damage to assets and so on. In order to overcome these problems, UIAD developed and built an information system for managing inventory, asset and documentation data. Even though the system has been released, basic testing needs to be done on each feature to ensure that the features function properly.

The aim of this research is to test the UIAD information system using the smoke testing method so that it can provide recommendations to developers regarding the test results as a tool to improve the quality of the UIAD

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information system so that it is more optimal when used.

2. LITERATURE REVIEW

There are several studies that have been carried out related to testing information systems using the smoke testing method, including research conducted by Zahron and Khairani, explaining that they have carried out tests on the exporter web directory application at the Department of Industry, Trade, Energy and Mineral Resources. Smoke testing ensures that the application is fundamentally operational and can be run without failure in the early stages of development (Almeranda Haryaveda Nurul Zahron, 2024).

Apart from that, there was also research conducted by Sakinah, et al who tested asset management applications using the Blackbox testing method. with Boundary Value Analysis and Equivalence Partitioning techniques. The test results show that of the 227 test scenarios, 226 met expectations, so it can be concluded that the test case success percentage was 99 percent (Agil Sakinah, Prima Aditiawan, & Lina Nurlaili, 2024).

In research conducted by Uminingsih, et al, they explained that testing on a website-based library information system using the Blackbox Testing method with the Equivalence Partitions technique showed that there were still forms whose output did not match the design because errors appeared. From the validity test, it was found that 75% of the system runs according to design. The test results provide recommendations for revisions to the syntax of forms that still have errors (Uminingsih, Nur Ichsanudin, Yusuf, & Suraya, 2022).

The research carried out by Adryanto together with the team took the form of testing the stock information system at PT. ABC where the testing used the Boundary Value Analysis (BVA) and Equivalence Partitioning (EP) methods, where these two methods were able to handle various types of input conditions and identify potential defects in software. The test results state that the stock information system functions well in normal and extreme conditions, there are several areas that require improvement to increase system accuracy (Bong, Safitri, & Hendry, 2024).

Testing of the E-commerce website system for a vape shop was carried out by Ulia, et al where the method used was Blackbox Alpha and Beta. The Beta test results showed that the majority of respondents gave a positive assessment of 95% to the quality of the system, while the Alpha test showed that the vape store e-commerce system was operating well and no significant errors or bugs were found. The test results provide recommendations that 5% of respondents have expressed dissatisfaction, therefore developers must improve, especially in the process of payment clarity and product after sales (Saputra et al., 2023).

In research conducted by Mifta Ainul with a team, the research team tested the house renovation management information system at the Jepara Regency public housing service using the contract acceptance testing method in user acceptance testing with 2 types of weighting scales and 9 question points. The results of the total percentage of acceptance testing were 86.2% with the criteria being very appropriate to the design and making it easier to manage the home surgery program (Chamida, Susanto, & Latubessy, 2021).

Judith Bryan and her team have carried out research in the form of software testing on website rooms using the white box testing method where the test case design technique uses a base path. The test results show that white box testing with the basis path technique can be used to find defects or errors in the software. There are 68 test scenarios with a low risk level for defects of 94% and a medium risk level of 6%. Then, of the 352 test paths, there are 192 pass paths, 5 fail paths, 114 error capture paths, and 41 paths with incorrect conditions (Sie, Izmy Alwiah Musdar, & Syamsul Bahri, 2022).

Based on the description of the results of previous research, the author focuses on the UIAD information system testing process with smoke testing as the basic test of the UIAD system. The smoke test results will provide information on the findings of errors or bugs in the basic functionalities of the system. Smoke testing recommendations can be used as a reference for improvements by the development team to continuously improve system quality.

3. METHOD

In carrying out this research, there were several stages carried out in testing the UIAD information system using smoke testing. Testing with smoke testing is testing system performance within a certain time in the form of system monitoring for each specific transaction. Smoke testing is carried out after the new function of the system being built is confirmed to be running well. Smoke testing provides confirmation regarding the quality and stability of the system. The process of the research stages can be seen in Figure 1 as follows:

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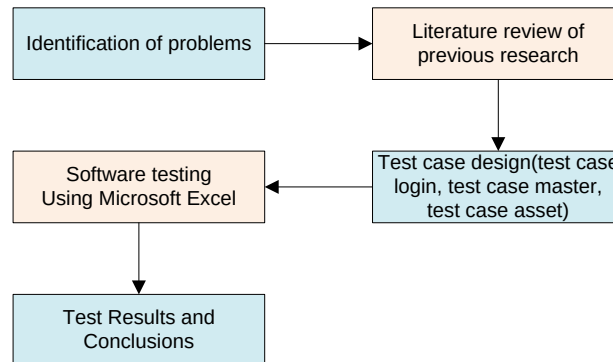


Fig. 1 Research Methodology Stages

Based on the research methodology stages, the first activity carried out is to carry out an analysis of the problem so that a solution to the problem can be identified. The next step is for the team to carry out a literature study to increase knowledge regarding the research to be carried out. The team also created a test design by creating test cases according to the results of the requirements specification analysis that was carried out in the previous stage. This test case list is used to carry out testing activities on the software. Researchers before creating test cases also study the UIAD information system that will be tested. At the final stage of testing, conclusions are drawn from the test results. This conclusion will later be used as a reference in improving and improving the quality of the UIAD information system.

4. RESULT

By carrying out basic testing using smoke testing on the UIAD information system, it is hoped that existing problems can be identified early before detailed testing is carried out. The first stage of the process, the researcher identified the problem, the result of which was that the UIAD information system had been developed in order to overcome the management of asset data, inventory and documentation which had so far been carried out by manual recording on paper forms. The UIAD information system had been completed and released, however Testing has never been carried out on the UIAD system regarding the quality and stability of the system. So it is necessary to carry out basic testing to help increase the efficiency of tests for detection.

Based on several literature reviews that have been carried out by the researcher, the next stage is that the researcher can create a test case scenario design. For this basic test, use a website test platform with access rights as admin. The test cases used in this test are divided into 3, namely login test cases, master test cases, and asset test cases. The results of the login test case can be seen in table 1 below:

Table 1
Login Test Case Results

Test Case Id	Test Scenario	Pre-Condition	Test Step	Expected Result	Actual Result	Test Status
A01	Login with valid data	Is on the login page	1. Fill username 2. Fill password 3. Press button "Login"	there will be go to main page	Save in the main page	Passed
A02	Login with invalid data	Is on the login page	1. Fill username 2. Fill password 3. Press button "Login"	there will be show pop up "incorrect password"	there is a pop up "incorrect username or password"	Passed

Based on table 1, there are 2 test cases, namely logging in with valid data and logging in with invalid data. The test results show that the test status is passed, meaning that the actual conditions are in accordance with the expected results. The second test case is a master data management test case. The test results can be seen in table 2 below:

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Table 2
Master Test Case Results

Test Case Id	Test Scenario	Pre-Condition	Test Step	Expected Result	Actual Result	Test Status
B01	Add PIC and Level master data	Is on the PIC and Level page	1. Press Button "Tambah" 2. Fill Nama 3. Fill Level 4. Fill Parent 3. Press button "Simpan"	Data is saved	saved	Passed
B02	Add user data	Is on the add user page	1. Press Button "Tambah" 2. Fill nama 3. Fill username 4. Fill level pengguna 5. Fill level PIC 6. Fill telephone 7. Fill Email 8. Fill Password 9. Fill Konfirmasi Password 10. Press button "Simpan"	Data is saved	saved	Passed
B03	Add land type data	Is on the add land page	1. Press Button "Tambah" 2. Fill in the name of the land type 3. Press button "Simpan"	Data is saved	saved	Passed
B04	Add building type data	Is on the add building type page	1. Press Button "Tambah" 2. Fill building type code 3. Fill in the name of the building type 4. Press button "Simpan"	Data is saved	saved	Passed
B05	Add room category data	Is on the add room categories page	1. Press Button "Tambah" 2. Fill room categories code 3. Fill in the name of the room categories 4. Press button "Simpan"	Data is saved	saved	Passed
B06	Add goods category data	Is on the add goods categories page	1. Press Button "Tambah" 2. Fill goods categories code 3. Fill in the name of the goods categories 4. Press button "Simpan"	Data is saved	saved	Passed
B07	Add vehicle category data	Is on the add vehicle categories page	1. Press Button "Tambah" 2. Fill vehicle categories code 3. Fill in the name of the vehicle categories 4. Press button "Simpan"	Data is saved	saved	Passed

In table 2 master test case data there are 7 test cases, namely add PIC and level master data, add user data, add land

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type data, add building type data, add room category data, add goods category data, add vehicle category data which were tested using test passed status, meaning that the 7 master system functions are running well and can fulfill the test case. Next in table 3 is a description of the test results for the asset data management function.

Table 3 Asset Test Cases

Test Case Id	Test Scenario	Pre-Condition	Test Step	Expected Result	Actual Result	Test Status
C01	Add land data	Is on the land asset data page	1. Press button "Tambah" 2.Fill sertifikat tanah 3. Fill nomor sertifikat 4. Fill atas nama 5. Fill link URL 6. Fill panjang tanah 7. Fill lebar tanah 8. Fill alamat 9. Press button "Simpan"	Data is saved	saved	Passed
C02	Add building data	Is on the building asset page	1. Press button "Tambah" 2.Fill kategori bangunan 3. Fill kode 4. Fill nama 5. Fill panjang 6. Fill lebar 7. Fill Keterangan 8. Fill link URL 9.Press button "Simpan"	Data is saved	saved	Passed
C03	Add room data	Is on the room asset page	1. Press button "Tambah" 2.Fill kategori ruang 3. Fill kode 4. Fill nama 5. Fill lantai 6. Fill level PIC 7. Fill PIC 8. Fill Keterangan 9. Fill link URL 10.Press button "Simpan"	Data is saved	saved	Failed
C04	Add goods data	Is on the goods asset page	1. Press button "Tambah" 2. Fill bangunan 3. Fill kategori barang 4. Fill jenis barang 5. Fill merk 6. Fill nama barang 7. Fill kondisi barang 8. Fill tahun 9. Fill link URL 10. Fill harga beli 11. Fill tanggal beli 12. Fill harga taksir 13. Fill keterangan 14. Fill jumlah barang 15. Press button "Simpan"	Data is saved	saved	Passed
C05	Add vehicle data	Is on the vehicle asset page	1. Press button "Tambah" 2. Fill kategori	Data is saved	saved	Passed

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			3. Fill model 4. Fill kode 5. Fill nama 6. Fill STNK 7. Fill atas nama 8. Fill nopol 9. Fill warna 10. Fill bahan bakar 11. Fill perolehan 12. Fill harga beli 13. Fill tanggal beli 14. Fill harga taksir 15. Fill link URL 16. Press button "Simpan"			
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Table 3 of the asset test has 5 test case scenarios, namely add land data, add building data, add room data, add goods data and add vehicle data with overall results of 4 test cases passed and 1 test case failed. Test case failure occurs in space data management because the script experiences an error so the data does not want to be stored in the database, this will have the impact of the condition of the space data being unable to be identified.

All test case tests have been carried out with the calculation results that the login test case shows 100% test case passed. The master test case is 100% test case passed, and the asset test case is 80% test case passed. The overall test results are described in figure 2 below

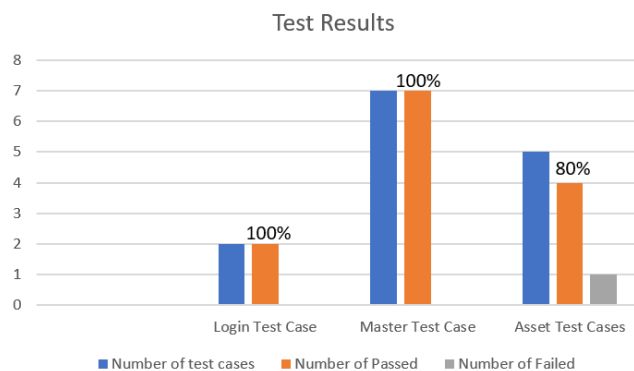


Fig. 2 Test Result Graph

DISCUSSIONS

he smoke test carried out on the UIAD system was the first step in testing. Several things were found in the research, namely that no critical problems were found and the main function was running as expected, however more detailed testing needed to be carried out regarding trials with invalid data. The results of testing with smoke testing can help measure readiness for more detailed testing in further UIAD system development.

Testing of the UIAD system was carried out manually by creating a list of test case scenarios and calculating the percentage of successful running functions using Microsoft Excel. Apart from being carried out manually, system testing can also be carried out using automation, as in Margaret and Lucia's research which utilized Katlon Studio as a test automation tool with a smoke testing and regression approach. This method was chosen because it is a type of test that is used as a parameter for whether the product will be released to users. Test results with Katlon Studio show a system success rate of 80.21% (Margaret Teacher Banjarnahor & Istiyowati, 2022).

Based on the research results, it can be confirmed that the system testing process is an important element of software quality assurance. System testing is part of the software development life cycle stage which ensures that the development process functions as expected (Andika, Nevile, & Satya, 2024).

Compared with the 2 previous studies, the difference lies in the type of test method where the testing carried out is only at the basic testing stage, so the choice of smoke testing as a testing method is appropriate because smoke testing is intended for basic testing for newly developed systems.

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5. CONCLUSION

Based on testing activities on the UIAD information system using the smoke testing method, it can be concluded that the calculation results with 3 test cases, namely the login test case, show 100% test case passed. The master test case is 100% test case passed, and the asset test case is 80% test case passed. Testing is carried out manually and has not been tested with invalid data. The next stage, after improvements have been made to the system, can be tested with invalid data and using automated testing with the help of testing software. The development team needs to be given training to carry out testing automatically at the next stage.

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