

FUNCTIONAL TESTING OF THE WEBSITE UMKM JAGIR USING BLACK BOX TESTING METHOD

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Abstract

The development of information technology has encouraged various sectors, including Micro, Small, and Medium Enterprises (MSMEs), to utilize digital platforms to improve service efficiency and access to information. One form of digitalization implementation is the Jagir MSME website, which was developed to support the activities of MSME players in Jagir Village, Surabaya City, by providing product information and facilitating interaction between business players and the community. In order for the website to function optimally and in accordance with user needs, functional testing is required before the system is put into operational use. This study aims to conduct functional testing on the Jagir MSME website using the Black Box Testing method with the Equivalence Partitioning technique. The testing was carried out by evaluating the suitability of the system output to the input provided without considering the internal structure of the system. The testing stages included needs analysis, test case creation, testing implementation, and testing results. The testing focused on three main forms, namely the Admin Login Form, Add Product Form, and Edit Product Form. The test results showed that of the total 41 test cases conducted, 36 test cases were successful and 5 test cases failed. These results indicate that most of the functions on the Jagir MSME website are running in accordance with the designed functional requirements and are declared operational. Thus, it can be concluded that the Black Box Testing method with the Equivalence Partitioning technique is effective in ensuring system reliability and helping to identify functional errors in the early stages of system use.

Keywords: Black Box Testing, Equivalence Partitioning, Functional Testing, MSME, Software Testing.

1. INTRODUCTION

In today's era, the dissemination and search for information can be done freely through the internet without any restrictions. The public has broad access to obtain the information they need. This technological development has not only impacted individuals, but has also reached various sectors of life, including the Micro, Small, and Medium Enterprises (MSME) sector (Ternando & Mulyono, 2022; Muqorobin et al., 2024).

MSMEs are small-scale business sectors that play an important role in driving economic improvement and growth in the community. The significant contribution of MSMEs makes them one of the main pillars in supporting the economy to achieve community welfare (Farisi et al., 2023). Along with the development of digital needs, MSMEs are now required to utilize information technology to improve efficiency and service coverage.

One form of digitalization implementation is Jagir MSMEs, which supports business activities in Jagir Village, Surabaya City. The Jagir MSMEs website was developed as a platform to provide product information and facilitate interaction between businesses and the community. For this platform to function optimally, the website must have good functional quality so that all features can run properly and provide a maximum user experience.

To ensure this quality, the application development process requires a software testing stage before it is published to users. Software testing serves to ensure that the system operates in accordance with the specified specifications and objectives (Uminingsih et al., 2022). Therefore, a validation process is required for each functional component of the website to ensure that it meets the requirements.

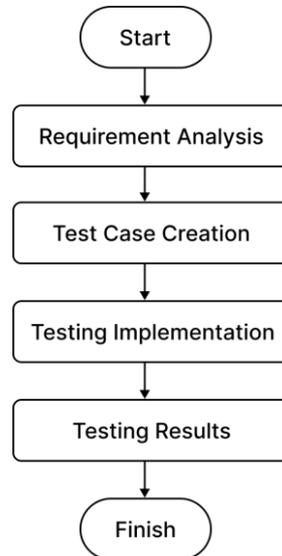
In functional testing, the appropriate method to apply to a website-based system is black box testing. Black box testing is a software testing technique that is carried out without looking at the internal structure of the system. The tester only assesses the suitability of the output with the input provided. The purpose of this test is to ensure that every function in the system runs according to the specified requirements (Ginting & Lubis, 2024). Thus, this study was conducted to perform functional testing on the Jagir MSME website using the black box testing method to ensure that all features and system components can run optimally, meet user requirements, and support MSME activities in the Jagir Village.

2. METHODOLOGY

Black Box Testing is a software testing method that evaluates a system based on the inputs provided and the outputs generated without considering the internal structure or processes of the system. This approach aims to ensure that every software function runs as expected by checking the conformity between inputs and outputs (Haqqoni et al., 2024; Fahrullah, 2021). In this study, functional testing on the Jagir MSME website was conducted using the Black Box Testing method with the Equivalence Partitioning technique.

Equivalence Partitioning is a testing technique that divides the input data on each form into several data classes, so that each type of input, whether valid or invalid, can be tested to ensure that the system works according to its function (Parlika et al., 2020). The application of the Black Box Testing method with the Equivalence Partitioning technique in this study was carried out through a series of testing stages that were arranged systematically. The testing methodology flow used is shown in Figure 1.

Figure 1. Software Testing Flowchart



The testing stages carried out in this study included the following steps:

1. Requirement Analysis, which involved identifying the functions of the system to be tested.
2. Test Case Creation, in which each test scenario was compiled based on the division of valid and invalid data classes.
3. Testing Implementation, which involves testing the application directly using the test cases that have been created. All outputs are compared with the expected results to determine whether the system functions are working correctly.
4. Testing Results, which involve explaining the results of the entire process that has been carried out from start to finish.

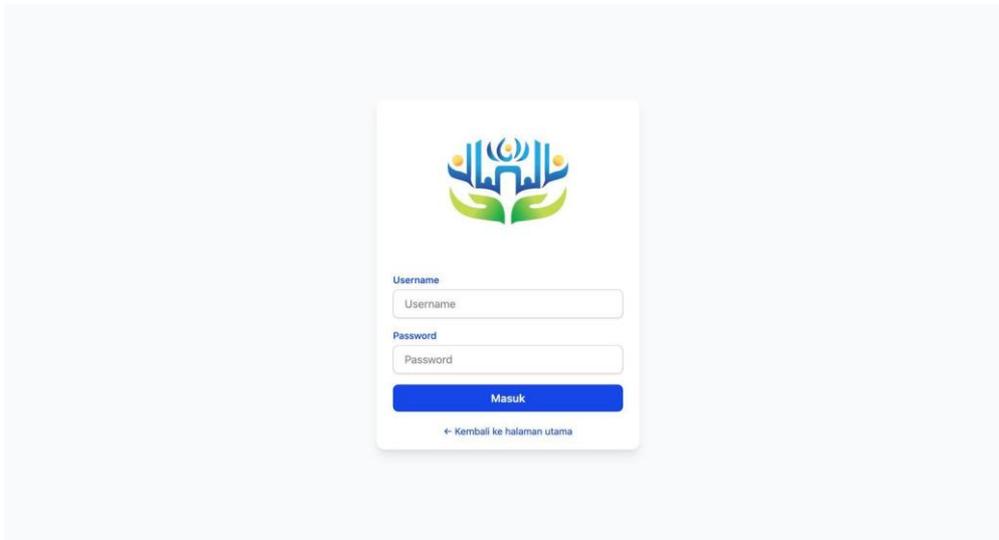
3. FINDINGS AND DISCUSSION

3.1 Requirement Analysis

A requirement analysis was conducted to identify the main functions of the Jagir MSME website, which was the subject of testing. This stage aimed to ensure that each system feature met user needs and functioned according to the established design. Based on observations of the system, there were three main forms that played an important role in website management, namely the Admin Login Form, Product Add Form, and Product Edit Form.

a. Admin Login Form

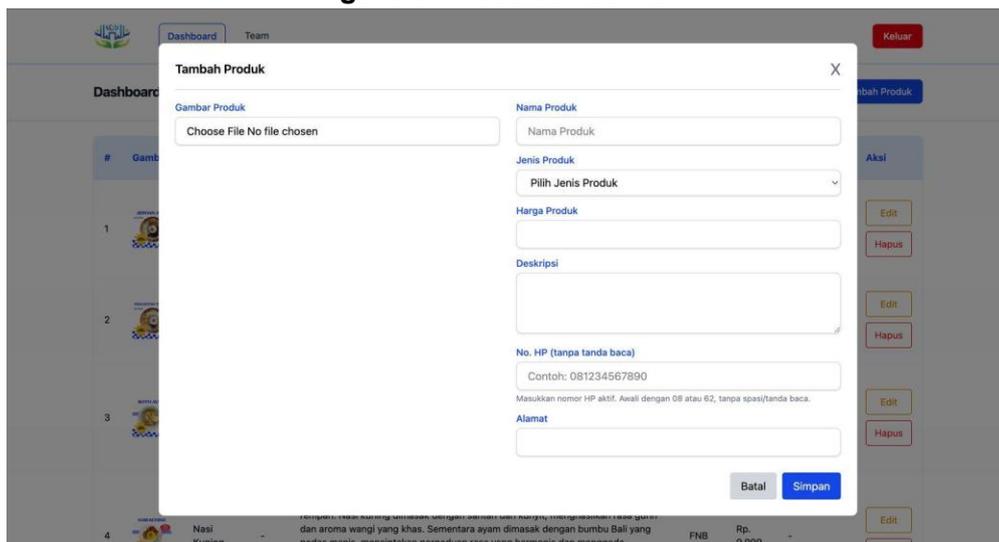
Figure 2. Admin Login Form

The image shows a login form with a logo at the top center. The logo consists of a stylized green and blue figure. Below the logo are two input fields: 'Username' and 'Password'. A blue button labeled 'Masuk' is positioned below the password field. At the bottom, there is a link that says '← Kembali ke halaman utama'.

The Admin Login Form is a key component that functions as a security system to restrict access to the Jagir MSME website management page. On this form, administrators are required to enter a username and password that have been registered in the system. The main purpose of this form is to ensure that only users with access rights can log into the admin dashboard. The system must be able to validate login data correctly, deny access if the data does not match, and provide error notifications if invalid input occurs. The existence of this login form is very important for maintaining product data security and preventing unauthorized access.

b. Product Add Form

Figure 3. Product Add Form

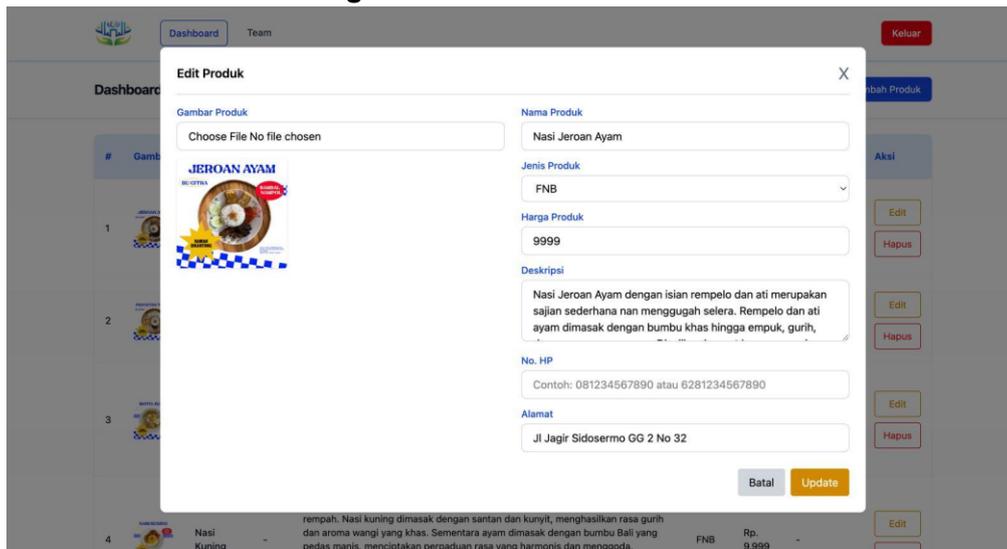
The image shows a 'Tambah Produk' (Add Product) form. It includes a 'Gambar Produk' field with a 'Choose File' button. The 'Nama Produk' field is a text input. The 'Jenis Produk' field is a dropdown menu. The 'Harga Produk' field is a text input. The 'Deskripsi' field is a text area. The 'No. HP (tanpa tanda baca)' field is a text input with a placeholder 'Contoh: 081234567890' and a note 'Masukkan nomor HP aktif. Awali dengan 08 atau 62, tanpa spasi/tanda baca.'. The 'Alamat' field is a text input. At the bottom, there are 'Batal' and 'Simpan' buttons.

The Add Product form is used by administrators to enter MSME product data into the website system. This form usually contains several important fields such as product name, category, price, product description, and product image. The purpose

of this form is to ensure that all product information is stored correctly in the database and displayed accurately on the user page. The system must be able to validate inputs, such as preventing empty fields, ensuring the price format is correct, and ensuring that image files are successfully uploaded. With this form, product management becomes more structured and makes it easier for MSMEs to update their product information.

c. Product Edit Form

Figure 4. Product Edit Form



The Product Edit Form is used to update product data that has been previously stored in the system. The main purpose of this form is to provide flexibility to administrators in making changes to information, such as changing prices, correcting descriptions, replacing product images, or updating stock. The system must be able to display the old product data first before editing, then accurately save the changes made. Validation is also necessary to prevent input errors that could corrupt product information. This form is very important for maintaining data accuracy and adjusting product information to the latest conditions of MSMEs.

3.2 Test Case Creation

The test case creation stage is carried out after the system requirements analysis process for the Admin Login Form, Add Product Form, and Edit Product Form has been identified. At this stage, each main function of the system is grouped based on the type of input data possible, both valid and invalid data, in accordance with the Equivalence Partitioning technique in the Black Box Testing method. The division of equivalence classes aims to represent all possible input conditions without having to test each piece of data individually.

- a. In the Admin Login Form, data classes are divided into valid inputs in the form of correct username and password combinations, as well as invalid inputs such as incorrect usernames, incorrect passwords, empty fields, characters that do not match the format, and malicious input attempts such as special characters or query manipulation. Each class is then designed into several test scenarios

to ensure that the system can accept legitimate access and reject inappropriate access.

- b. On the Add Product Form, test case creation focuses on the completeness and accuracy of the product data entered. Valid data classes include input of product name, price, description, and image in the appropriate format, while invalid data classes include empty fields, non-numeric prices, negative values, excessive file sizes, unsupported image formats, and character lengths that exceed the limit. Test scenarios are designed to ensure that the system only stores product data that meets the validation criteria.
- c. In the Edit Product Form, test cases are created to test the process of updating previously stored data. Valid data classes include changes to product names, prices, descriptions, and images in the correct format, while invalid data classes include the deletion of important fields, filling in data that does not match the format, illogical price values, and input of unauthorized characters. This test aims to ensure that data changes can only be made if they comply with system rules.

3.3 Testing Implementation

The testing was conducted by applying all test cases that had been compiled in the previous stage directly to the Jagir MSME website. Each test scenario was run using input data that represented valid and invalid equivalence classes in accordance with the Equivalence Partitioning technique in the Black Box Testing method. The system output was then compared with the expected output to determine whether the system functions were working correctly.

Table 1. Admin Login Form

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
TC01	Valid Login	Correct username and password	User is redirected to the dashboard	Login successful	Valid
TC02	Invalid Login	Incorrect username	Access denied	Access denied	Valid
TC03	Incorrect password	Incorrect password	Access is denied	Access is denied	Valid
TC04	Empty username	Empty	Warning message appears	Warning message appears	Valid
TC05	Empty password	Empty	Warning message appears	Warning message appears	Valid

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
TC06	Empty username and password	—	Warning message appears	Warning message appears	Valid
TC07	Symbol characters input	@@@	Access is denied	Access is granted	Invalid
TC08	Username contains leading spaces	“ admin ”	Spaces are disabled	Spaces are disabled	Valid
TC09	Password contains trailing spaces	“ password :	Spaces are disabled	Spaces are disabled	Valid
TC10	Excessive password length	100 karakter	Access is denied	Access is denied	Valid

On the Admin Login Form, testing covered valid login conditions, username errors, password errors, empty fields, use of symbols, spaces in inputs, and excessive password length. Most scenarios showed that the system was able to reject invalid inputs and provide warnings as needed. However, one case was found where the system still accepted symbol inputs that should have been rejected, so it was categorized as an invalid result. This finding indicates that although login validation is generally working well, there are still gaps in the filtering of special characters that need to be addressed.

Table 2. Add Product Form

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
TC01	Valid complete data	All fields are correctly filled	Saved successfully	Saved successfully	Valid
TC02	Empty product name	—	Rejected	Rejected	Valid
TC03	Empty price	—	Rejected	Rejected	Valid

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
	field				
TC04	Empty description field	—	Rejected	Rejected	Valid
TC05	Empty image field	—	Rejected	Rejected	Valid
TC06	Alphabetic price input	abc	Rejected	Rejected	Valid
TC07	Negative price value	-5000	Rejected	Rejected	Valid
TC08	Zero price value	0	Rejected	Rejected	Valid
TC09	Excessive price value	999999999	Rejected	Accepted	Invalid
TC10	Invalid image format	.exe	Rejected	Rejected	Valid
TC11	Oversized image file	>5MB	Rejected	Rejected	Valid
TC12	Excessive product name length	200 karakter	Rejected	Rejected	Valid
TC13	Symbol characters in product name	###	Rejected	Rejected	Valid
TC14	Duplicate product name	Sama	Rejected	Accepted	Tidak Valid
TC15	All fields empty	—	Rejected	Rejected	Valid
TC16	Random phone number input	3274392	Rejected	Rejected	Valid

Testing on the Add Product form was conducted by entering complete product data as a valid class, as well as various invalid conditions such as empty fields, non-numeric prices, negative values, large image sizes, incorrect file formats, and duplicate product names. The test results show that most of the system validations

worked well. However, several weaknesses were found, namely that the system still accepted prices with very large values and product data with duplicate names, which should have been rejected by the system. This indicates that the value restriction mechanism and data uniqueness check still need to be improved.

Table 3. Product Edit Form

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
TC01	Valid edit operation	Updated price	Data is saved successfully	Data is saved successfully	Valid
TC02	Valid product name edit	Updated name	Data is saved successfully	Data is saved successfully	Valid
TC03	Empty product name	—	Rejected	Rejected	Valid
TC04	Negative price value	-1000	Rejected	Rejected	Valid
TC05	Alphabetic price input	abc	Rejected	Rejected	Valid
TC06	Valid image update	JPG	Data is saved successfully	Data is saved successfully	Valid
TC07	invalid image format	.exe	Rejected	Rejected	Valid
TC08	Excessive description length	>200 karakter	Rejected	Rejected	Valid
TC09	No data modification	—	Data is saved successfully	Data is saved successfully	Valid
TC10	Empty price field	—	Rejected	Rejected	Valid
TC11	Zero price value	0	Rejected	Rejected	Valid
TC12	Product name with leading and trailing spaces	“ Produk ”	Rejected	Accepted	Invalid
TC13	Illegal characters in	###	Rejected	Rejected	Valid

Test Case ID	Test Scenario	Input Data	Expected Output	Actual Result	Status
	product name				
TC14	Duplicate product data	Same as existing data	Rejected	Accepted	Invalid
TC15	All fields empty	—	Rejected	Rejected	Valid

On the Product Edit Form, testing focused on the process of updating stored product data. Valid inputs such as changes in price, product name, and images were successfully saved by the system. However, several invalid conditions were found that were still accepted by the system, such as the use of spaces in product names and the storage of duplicate data. These findings indicate that although the edit function works in general, validation of data consistency and cleanliness is still not fully optimal.

3.4 Testing Results

Based on the functional testing that has been carried out, the results show the overall success rate of the Jagir MSME website system. Testing was carried out on three main forms, namely the Admin Login Form, Add Product Form, and Edit Product Form, with a total number of test cases covering valid and invalid input conditions.

Table 4. Testing Results

Form	Number of Test Case	Successful	Failed
Admin Login	10	9	1
Add Product	16	14	2
Edit Product	15	13	2
Total	41	36	5

Overall, the test results show that the majority of the Jagir MSME website functions are running in accordance with the designed functional requirements. The test success rate is relatively high, so the system can be declared operationally viable. However, several invalid results indicate that the system still has shortcomings in certain input validation aspects. Several minor errors found in input validation will be evaluated to improve the quality of the system, particularly in terms of data consistency and input value restrictions. These results form an important basis for the evaluation

stage to improve the system so that it is more secure, consistent, and reliable in product data management and user authentication.

4. CONCLUSION

Functional testing on the Jagir MSME website using the Black Box Testing method with the Equivalence Partitioning technique shows that most of the system functions are running according to the designed requirements. The Admin Login Form, Add Product Form, and Edit Product Form are able to accept valid inputs and reject invalid inputs properly. The test results prove that the system has met the main functional aspects and is suitable for operational use. However, several minor weaknesses were found in data validation, particularly related to input value restrictions and duplicate data, which need to be improved to enhance the quality of the system. Overall, it can be concluded that the Black Box Testing method has proven to be effective in ensuring the reliability of system functions and helping to identify errors from the early stages of use.

REFERENCES

- Fahrullah. (2021). IMPLEMENTASI PENGUJIAN BLACK BOX PADA SISTEM INFORMASI MONITORING AKADEMIK DENGAN PENDEKATAN TEKNIK EQUIVALENCE PARTITIONS. *Jurnal Teknosains Kodepena*, 1(2), 94–100.
- Farisi, S. Al, Fasa, M. I., & Suharto. (2022). PERAN UMKM (USAHA MIKRO KECIL MENENGAH) DALAM MENINGKATKAN KESEJAHTERAAN MASYARAKAT. *Jurnal Dinamika Ekonomi Syariah*, 9(1), 73–84. <https://doi.org/https://doi.org/10.53429/jdes.v9i1.307>
- Ginting, M. P. A., & Lubis, A. S. (2024). Pengujian Aplikasi Berbasis Web Data Ska Menggunakan Metode Black Box Testing. *COSMIC JURNAL TEKNIK*, 2(1), 41–48. <https://doi.org/10.55537/cosmic>
- Haqqoni, B. M., Winarno, I., Musthofa, M. N., Sakdi, M., & Saifudin, A. (2024). Pengujian Fungsional Perangkat Lunak Sistem Informasi Perpustakaan Dengan Metode Blackbox Testing Bagi Pemula. *LOGIC : Jurnal Ilmu Komputer Dan Pendidikan*, 2(4), 696–704.
- Muqorobin, Prakoso, A. S., Saputra, R. A., Mubarrock, W., & Atasofia, A. R. (2024). Perancangan Sistem Informasi UMKM Berbasis Website Desa Manjung. *Jurnal BUDIMAS*, 06(02), 251–262.
- Parlika, R., Nisaa, T. A., Ningrum, S. M., & Haque, B. A. (2020). Studi Literatur Kekurangan dan Kelebihan Pengujian Black Box. *TEKNOMATIKA*, 10(02), 131–140.
- Ternando, D., & Mulyono, H. (2022). Sistem Informasi Promosi Berbasis Web Pada UMKM Jajanan Aulia. *Jurnal Manajemen Sistem Informasi*, 7(3), 487–500. <https://doi.org/10.33998/jurnalmsi.2022.7.3.185>

Uminingsih, Ichsanudin, M. N., Yusuf, M., & Suraya. (2022). PENGUJIAN FUNGSIONAL PERANGKAT LUNAK SISTEM INFORMASI PERPUSTAKAAN DENGAN METODE BLACK BOX TESTING BAGI PEMULA. STORAGE – Jurnal Ilmiah Teknik Dan Ilmu Komputer, 1(2), 1–8. <https://doi.org/10.55123>