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Functional Testing of the JivaJoy Online Product Stock Management and Ordering System Software Using Black Box Testing

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Abstract: This study focuses on black-box testing of JivaJoy software, an online product stock management and ordering system. The primary goal of this research is to evaluate the functionality and performance of the system's key features, including profile management, CRUD operations for admin and customer accounts, product stock management, shopping cart, order management, and AI counseling. Black-box testing was applied to assess whether these features meet expected operational standards and user requirements without considering the internal code structure. The test results indicate that most features function as expected. However, some issues were identified related to input validation, particularly with email format, phone number length, file uploads, and product stock management. Additionally, the order management and AI counseling features showed deficiencies in error handling and input validation. Based on these findings, the study recommends improvements in input validation, product stock management, shopping cart functionality, and AI counseling systems to enhance the reliability and performance of the JivaJoy platform. These enhancements are essential to deliver more efficient, secure, and optimal services, ensuring better user experiences and customer satisfaction.

Keywords: Black Box, Testing, Functionality

1. INTRODUCTION

The rapid advancement of information and communication technology has intensified business competition (Sari & Nurhayaty, 2024). The implementation of an appropriate information system can significantly contribute to a company's performance, enhance the quality of business activities, and enable the company to compete effectively with its rivals (Simanjuntak et al., 2024). In today's competitive business era, information technology has become one of the key factors in achieving a competitive advantage. Software applications are utilized by companies to optimize various operational processes (Salwa & Nasution, 2023). One of the crucial processes is the management of inventory and online product ordering, which is essential for companies to meet customer demands promptly and avoid lost profit opportunities due to stock unavailability (Hernawati et al., 2020). Therefore, an information system that supports inventory management and online ordering is highly needed, particularly to boost sales and provide greater convenience for customers (Dinata & Saepudin, 2024).

In the development of such complex information systems, software testing is a critical step to ensure the system's functionality aligns with specifications and business requirements (Aziz et al., 2020). There are various types of software testing, one of which is black-box testing

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(Nurudin et al., 2019). Black-box testing does not require knowledge of the internal structure of the software but focuses on examining whether the application functions properly and meets user requirements (Saputra et al., 2023). Thus, this testing method is highly relevant for identifying errors in the application and improving the quality of the developed software (Nurudin et al., 2019). Functional testing using this method evaluates the software's output based on the given input, without considering the implementation of its internal code (Saputra et al., 2023).

Previous studies have applied black box testing methods to ensure the functionality of sales information systems. In 2019, Nurudin et al. conducted black box testing on a web-based sales application, and the test results showed that several improvements needed to be made to the system so that the application could be used effectively (Nurudin et al., 2019). A similar study was also conducted by Anardani and Putra, performing black box functional testing on the Manies Group e-commerce platform, where although most functions worked well, one function was found to have failed (Anardani & Putera, 2019). In this study, we focus on black-box testing for the JivaJoy information system, an online aromatherapy sales platform aimed at mothers experiencing baby blues. Black-box testing on the JivaJoy information system is crucial to ensure that each feature functions according to user needs, such as product information, product ordering, consultation services, and news related to baby blues.

Therefore, this study aims to apply the Black Box Functional Testing method in an effort to improve the quality and reliability of the JivaJoy information system. With a systematic and precise testing approach, the expected results of this testing can serve as a basis for system evaluation and improvements, thus minimizing the risk of errors. This evaluation is intended to strengthen the system's performance in supporting JivaJoy's operations and enhance customer satisfaction through more optimal services.

2. THEORETICAL STUDY

Sales Information System

An information system consists of a set of interrelated components that work together to achieve the expected objectives (Sitorus & Sakban, 2021). An information system is the relationship between data and methods that use hardware and software to deliver useful information (Alda, 2023). Meanwhile, a sales information system is a series of procedures designed to record, compute, and produce documents and information related to sales activities.

This system supports the needs of management and other relevant parties, from the ordering stage to the completion of the sales transaction (Selay et al., 2023).

Software Testing

Testing is the process of identifying program errors that were not revealed during the software development process (Anardani & Putera, 2019), it is conducted to obtain software with good quality. Generally, there are three types of software testing techniques: White-Box Testing, Black-Box Testing, and Grey-Box Testing (Dhaifullah et al., 2022). Functional testing of an information system needs to be carried out systematically with the appropriate method to ensure that the application system functions properly and meets user needs (Haqqoni et al., 2024)**.**

Black Box Testing

Black Box Testing is a type of testing based on the application's details, such as the application interface, existing functions, and the alignment of these functions with the desired system workflow as designed by the developers (Uminingsih et al., 2022). This method focuses on testing the functionality of the application without considering the internal structure or its code. The principle of Black Box Testing is to identify errors in several categories, including incorrect or missing functions, (interface errors), errors in data structures and database access, (performance errors), and initialization and termination errors (Sasongko et al., 2021).

Techniques used in black-box testing include Equivalence Partitioning, Fuzzing, Boundary Value Analysis, Cause-Effect Graph, Orthogonal Array Testing, State Transition, and All Pair Transition (Isnain et al., 2021). The Equivalence Partitioning technique is one of the methods in black-box testing used to examine input types and conditions. These inputs are grouped into several equivalence classes, which cover both valid and invalid categories (Amalia et al., 2021).

3. METHOD

The data analysis technique used is descriptive qualitative, which outlines the engineered product in the form of software and tests the program's reliability. The black-box method with functional testing defines a set of input/output conditions for each module and tests the functional specifications of the program (Anardani & Putera, 2019). In the conducted research, several stages are followed, including understanding the requirements analysis, developing test

cases, performing testing, and preparing a summary report of the testing results (Jibril et al., 2024).

The research flow begins with understanding the requirements analysis, which covers all aspects of the system, both internal and external, directly related to the system users. The next step is the development and execution of *test cases* to verify whether the features and functions in the JivaJoy website work as expected (Jibril et al., 2024). In this study, *test cases* for the software to be tested are created by applying the Equivalence *Partitioning technique* (Amalia et al., 2021). After the testing is conducted, any bugs or errors found on the website are documented in a report for evaluation (Jibril et al., 2024).

4. RESULT AND DISCUSSION

In the testing conducted on the development of the Product Stock Management and Online Ordering Website for JivaJoy, various system functions were tested to ensure that each feature works properly according to user needs. The testing was performed on several key features such as user registration, account management, product stock management, shopping cart, as well as ordering and AI counseling.

Table 1 Profile Testing Results

ID	Function	Test Case	Result
J01	Sign in	Valid email and password Incorrect password Incorrect email format There are empty fields Email and password not registered Email and password are registered, but personal data has not been filled in	Success Success Success Success Success Fail
J02	Sign up	Username and personal data not registered Username is already registered Phone number is already registered Profile photo upload is in an incorrect format Profile photo upload exceeds 5 MB There are empty fields Phone number has only 1 digit Phone number exceeds 15 digits	Success Success Success Fail Success Success Fail Success
J03	Log out	Log out customer Log out admin	Success Success
J04	Profile Display	Profile data matches the registration	Success

		information Profile data after profile update	 Success
J05	Profile Update	All fields are valid Invalid email Phone number has only 1 digit Phone number exceeds 15 digits There are empty fields Profile photo upload is in an incorrect format Profile photo upload exceeds 5 MB	Success Fail Fail Success Success Fail Fail
J06	Delete Account	Click Yes on the confirmation Click No on the confirmation	Success Success

Most features functioned as expected, including sign-in, sign-out, profile display, profile update, and account deletion. However, there were some failures, particularly in the sign-up and profile update functions, related to input validation such as phone number, profile photo format, and input data length.

Table 2 Admin CRUD Testing Results

ID	Function	Test Case	Result
J07	Create Admin Account	All fields have valid data Email is already registered Invalid email format Phone number has only 1 digit Phone number exceeds 15 digits There are empty fields Profile photo upload is in an incorrect format Profile photo upload exceeds 5 MB	Success Success Fail Fail Success Success Fail Success
J08	Read Admin Account	View list of admin accounts Display details of a specific admin account	Success Success
J09	Update Admin Account	All fields have valid data Invalid email format Phone number has only 1 digit Phone number exceeds 15 digits There are empty fields Profile photo format is incorrect Uploaded file exceeds 5 MB Update admin account access rights (role).	Success Success Fail Success Success Fail Fail Success
J10	Delete Admin Account	Clicking Yes on the confirmation Clicking No on the confirmation	Success Success

The CRUD functions for the admin account worked well in most cases, with failures found in input data validation, profile photo format, and file size. This testing showed that the admin account management is on the right track, but there are still areas that require improvement to make it more secure, effective, and user-friendly.

Table 3 Customer CRUD Testing Results

ID	Function	Test Case	Result
J11	Create Customer Account	All data in the fields are valid There are empty fields Uploaded file is not in the correct format Uploaded image exceeds 5 MB Username is already registered Password does not meet the requirements Invalid email format Phone number has only 1 digit Phone number exceeds 15 digits	Success Success Fail Success Success Success Success Fail Success
J12	Read Customer Account	Display all customer accounts Display details of a specific customer account	Success Success
J13	Update Customer Account	All data in the fields are valid There are empty fields Changing the profile picture with an invalid format Upload image exceeds 5 MB Change the username to one already used by another customer Invalid email format Phone number has only 1 digit Phone number exceeds 15 digits	Success Success Fail Fail Success Success Fail Success
J14	Delete Customer Account	Click Yes on the confirmation Click No on the confirmation When the user is making a purchase	Success Success Fail

The customer account management feature testing showed good results, with the Create, Read, Update, and Delete functions performing as expected in most scenarios. The Read and Delete functions successfully displayed and deleted data without issues. For Create and Update functions, validation for some scenarios such as file upload format, phone number length, and email format worked well, although there were certain cases that should have been rejected but were considered successful. Overall, the system requires improvements in input validation to ensure all scenarios are handled as expected.

Table 4 Product Stock CRUD Testing Results by Admin

ID	Function	Test Case	Result
J15	Create stock product	Filling the stock with appropriate values Filling the stock field with letters Filling the stock with negative numbers Filling the stock with more than 10 digits Filling the stock with the number 0 Leaving the stock field empty	Success Success Success Success Fail Success
J16	Read stock product	Viewing the product's stock	Success
J17	Update stock product	Editing the stock to 0 Editing the stock to a 2-digit number Editing the stock to a negative number Editing the stock to reduce the initial stock Editing the stock to increase from the initial stock	Fail Fail Fail Fail Fail
J18	Delete stock product	Clicking Yes on the confirmation Clicking No on the confirmation	Fail Success

The product stock CRUD testing results showed that the create function mostly worked as expected, except when entering stock with the number 0, which did not meet expectations. The read function worked as expected. However, all update tests did not meet expectations, and for the delete function, only the cancellation confirmation worked. Improvements are needed in input validation and stock update and deletion logic.

Table 5 Customer Shopping Cart CRUD Testing Results

ID	Function	Test Case	Result
J19	Create Cart	Adding an item to the cart before login Adding an item to the cart after login Adding an item exceeding the stock	Success Success Success
J20	Read Cart	Viewing the cart from the Customer side	Success
J21	Update Cart	Increasing the quantity of an item Decreasing the quantity of an item Increasing the quantity of an item exceeding the stock	Success Success Success
J22	Delete Cart	Clicking Yes on the confirmation Clicking No on the confirmation	Success Success

The shopping cart CRUD testing results showed that all functions, including adding items to the cart before and after login, stock validation, updating item quantities, and deleting items, worked well without issues. This indicates that the cart system functions as expected, including the security for the deletion process with confirmation.

Table 6 Order CRUD Testing Results

ID	Function	Test Case	Result
J23	Create order	Add order with valid data Empty field exists File upload not in the correct format File upload exceeds 5 MB Map field not filled with a link WhatsApp field not filled with numbers Change order data on website URL	Success Success Success Success Fail Fail Fail
J24	Read order	View all order data View order data details	Success Success
J25	Update order	All fields filled with valid data Payment proof upload not in the correct format File upload exceeds 5 MB Change WhatsApp field to non-numeric Change Google Maps link field to non-link Empty field exists Selecting order status as "being packaged" when no payment proof has been uploaded	Success Success Success Fail Fail Success Fail
J26	Delete order	Click Yes on confirmation Click No on confirmation	Success Success

The order CRUD testing results showed that most functions worked well, including creating, reading, updating, and deleting data. However, there were several input validation failures, such as inappropriate file formats, invalid data for WhatsApp numbers that were not numeric, and Google Maps links that were not properly formatted links, thus requiring improvements to enhance system reliability.

Table 7 AI Counseling Test Results

ID	Function	Test Case	Result
J27	Counseling AI	Submitting relevant questions Submitting irrelevant questions Leaving the question field empty	Success Fail Success

The AI Counseling testing results showed that the system successfully responded to relevant questions and empty fields, but failed to handle irrelevant questions. Improvements are needed to enhance responses to irrelevant inputs to make the feature more optimal.

Based on the test results, the system demonstrated good performance with a success rate of 83.62%. This percentage indicates that most features have functioned according to the planned specifications, although there are still some aspects that require improvement to achieve more optimal performance. These results serve as a reference for system refinement to better meet user needs comprehensively.

5. CONCLUSION

Black box testing on the JivaJoy information system was conducted comprehensively on various main system features, including profile management, admin and customer CRUD operations, product stock management, customer cart CRUD, order CRUD, and AI counseling testing. The test results showed that most system functions worked well, but there were several areas requiring improvement to enhance system reliability. The main weaknesses were found in input validation, such as file formats, phone number length, email validation, and the product stock management module that did not perform as expected. Although the ordering and AI counseling modules showed fairly good performance, there were still shortcomings in input validation and error handling. Based on the test results, the system's success rate reached 83.62%, which indicates that the majority of functions have operated according to specifications, but improvements in input validation, product stock module, shopping cart management, error handling in AI counseling, and strengthening security aspects need to be undertaken so that JivaJoy can provide more reliable and optimal services to users.

REFERENCES

Alda, M. (2023). Sistem informasi monitoring stok motor listrik alat produksi berbasis mobile Android. Methomika Jurnal Manajemen Informatika dan Komputerisasi Akuntansi, 7(1), 68–77. https://doi.org/10.46880/jmika.Vol7No1.pp68-77

Amalia, A., Putri Hamidah, S. W., & Kristanto, T. (2021). Pengujian black box menggunakan teknik equivalence partitions pada aplikasi e-learning berbasis web. Building of Informatics, Technology and Science (BITS), 3(3), 269–274. https://doi.org/10.47065/bits.v3i3.1062

Anardani, S., & Putera, A. R. (2019). Analisis pengujian sistem informasi website e-commerce Manies Group menggunakan metode blackbox functional testing. Prosiding Seminar Nasional Hasil Penelitian LPPM Universitas PGRI Madiun, 72–75.

Aziz, I. A., Setiawan, B., Khanh, R., Nurdiyansyah, G., & Yulianti, Y. (2020). Pengujian black box pada aplikasi sistem kasir berbasis website menggunakan teknik equivalence partitions. Jurnal Teknologi Sistem Informasi dan Aplikasi, 3(2), 82. https://doi.org/10.32493/jtsi.v3i2.4693

Dhaifullah, I. R., Muttanifudin H, M., Ananda Salsabila, A., & Ainul Yaqin, M. (2022). Survei teknik pengujian software. Journal Automation Computer Information System, 2(1), 31–38. https://doi.org/10.47134/jacis.v2i1.42

Dinata, F. S., & Saepudin, S. (2024). Penerapan standar FEAF pada rancangan sistem informasi purchase order online sayuran Korea Ferdy's Farm berbasis web. SISMATIK (Seminar Nasional Sistem Informasi Dan Manajemen Informatika) Universitas Nusa Putra, 4, 1–12.

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.

Hernawati, Y., Mulyadi, N. P., Lestari, T., & Rabbani, D. F. (2020). Evaluasi sistem pengendalian stock barang jadi di gudang PT. Indocare Citra Pasifik Group. E-Journal Equilibrium Manajemen, 6(2), 20–27.

Isnain, N., Sulaiman, H., & Rahmatika. (2021). Pengujian usability pada aplikasi auto reply for messenger menggunakan SUS. Explorer, 1(2), 71–80. https://doi.org/10.47065/explorer.v1i2.97

Jibril, M., Zulrahmadi, & Amin, M. (2024). Pengujian sistem informasi e-modul pada SMPN 1 Tempuling menggunakan black box testing. Jurnal Perangkat Lunak, 6(2), 327–332. https://doi.org/10.32520/jupel.v6i2.3326

Nurudin, M., Jayanti, W., Saputro, R. D., Saputra, M. P., & Yulianti, Y. (2019). Pengujian black box pada aplikasi penjualan berbasis web menggunakan teknik boundary value analysis. Jurnal Informatika Universitas Pamulang, 4(4), 143. https://doi.org/10.32493/informatika.v4i4.3841

Salwa, R., & Nasution, M. I. P. (2023). Inovasi bisnis organisasi melalui pemanfaatan sistem dan teknologi informasi. Cemerlang: Jurnal Manajemen dan Ekonomi Bisnis, 4(1), 21–

31. https://doi.org/10.55606/cemerlang.v4i1.2228

Saputra, U., Astrianda, N., Nasution, B. R., Anggara, A. A., Qaisa, R. S., & Jakfar, A. E. (2023). Analisa pengujian sistem informasi website e-commerce Bali-Store menggunakan metode black box testing. Jurnal Teknologi Informasi, 2(2), 95–102. https://doi.org/10.35308/jti.v2i2.7847

Sari, D. R. J., & Nurhayaty, M. (2024). Penerapan go digital marketing untuk meningkatkan penjualan produk pada UMKM Galendo (studi kasus di PD Rasa Galendo Kelurahan Cigembor Kecamatan Ciamis Kabupaten Ciamis Jawa Barat). Jurnal Media Teknologi, 11(1), 11–17. https://doi.org/10.25157/jmt.v11i1.4224

Sasongko, B. B., Malik, F., Ardiansyah, F., Rahmawati, A. F., Adhinata, F. D., & Rakhmadani, D. P. (2021). Pengujian blackbox menggunakan teknik equivalence partitions pada aplikasi Petgram mobile. Journal ICTEE, 2(1), 10. https://doi.org/10.33365/jictee.v2i1.1012

Selay, A., Andgha, G. D., Alfarizi, M. A., Wahyudi, M. I. B., Falah, M. N., Encep, M., & Khaira, M. (2023). Karimah Tauhid, Volume 2 Nomor 1 (2023), e-ISSN 2963-590X. Karimah Tauhid, 2(1), 232–237. https://doi.org/10.30997/karimahtauhid.v2i1.7746

Simanjuntak, A., Wijaya, K. D., Permatasari, A., Astuti, A. L., & Zy, A. T. (2024). Pengujian dan penjaminan kualitas software point of sale penjualan motor PT. XZY dengan metode black box. Jurnal Sains Komputer & Informatika (J-SAKTI), 8(1), 108–119. https://doi.org/10.30645/j-sakti.v8i1.770

Sitorus, J. H. P., & Sakban, M. (2021). Perancangan sistem informasi penjualan berbasis web pada toko Mandiri 88 Pematangsiantar. Jurnal Bisantara Informatika (JBI), 5(2), 1–13.

Uminingsih, Nur Ichsanudin, M., Yusuf, M., & Suraya, S. (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/storage.v1i2.270