Test plan for web application „Evidencija računarske opreme“

IT Academy – Final project at the Department for QA and software testing

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1. Introduction

This test plan outlines the testing process for the website "Evidencija Računarske Opreme" located at puppies-closet.com/evidencija. The plan is based on the Software Specification document available in the main folder under the title "Dokumentacija – Evidencija računarske opreme."

The testing will be conducted using a combination of manual and automated techniques. A set of renowned open-source tools will be utilized throughout the testing process, including:

- Visual Studio Code: A coding tool for script development.
- Selenium WebDriver: A tool for simulating web browsers and automating web interactions.
- Postman API: A tool for testing API requests and verifying responses.
- Free Cam Screen Recorder and Ufile.io: Tools for recording bug reports and securely storing them.
- Chrome DevTools: Developer tools for debugging and website analysis.
- Apache JMeter: A tool for performance testing and analysis.

It is important to note that API testing was conducted on the 'randomuser.me' API service to showcase a minimum of five API tests written using Postman API and JavaScript. The API test collection for this service is located in the 'API tests' folder.

Additionally, python automated test scripts are located in the 'Automated tests' folder. Similarly, the performance tests conducted using Apache JMeter are located in the 'JMeter tests' folder.

This test plan aims to provide comprehensive coverage of the website's functionality and ensure its reliability, performance, and adherence to the specified requirements. The plan will guide the testing activities and serve as a reference for the test execution phase.

By utilizing a combination of manual and automated testing techniques along with the mentioned tools, the goal is to achieve thorough test coverage and deliver a high-quality website that meets user expectations.

2. Software Specification Overview

The Software Specification Document outlines all of the functionalities and features of the website Evidencija Računarske Opreme. This website serves as a platform for assigning and decommissioning computer equipment to employees within a company.

1. The main functionalities of the web application include: User authentication.
2. Equipment management: Users can view, enter, modify, and delete data related to computer equipment.
3. Employee management: Users can manage information related to employees, including assigning to and returning equipment from them.

4. Reporting: The system provides the ability to generate reports.
5. Access rights: Access to different modules is controlled based on the access rights assigned by the administrator.

The website provides access to both admin and user profiles, with the majority of features accessible through the admin profile, which was primarily used for testing purposes. The documentation defines seven modules within the website:

1. **Account Management**

The Account Management module facilitates the creation, modification, and deletion of admin and user profiles. It encompasses access control features for both admin and user profiles.

2. **Header and Footer**

The Header and Footer sections of the website contain navigation bars, links, and customer support information. The Header includes navigation elements and links for easy site navigation, while the Footer provides access to customer support, user manuals, and contact information.

3. **Employees**

The Employees module enables the admin profile to manage employee profiles. It allows for the creation, deletion, and modification of employee profiles. This section also facilitates the assignment and decommissioning of equipment to individual employees.

4. **Equipment**

The Equipment module allows the administrator to manage equipment statuses. It enables the creation, deletion, and modification of equipment data, including information about the assigned office, inventory number, and serial number.

5. **Reports**

The Reports module's functionality is to download and print reports related to equipment distribution within the company. Reports can be generated based on various criteria, such as office, organization unit, or equipment assigned to specific employees.

6. **Type/Brand of Equipment**

The Type/Brand of Equipment module allows for the registration of new equipment types or modifications to existing ones. It facilitates the management of data related to equipment types and brands.

7. **Office/Organization Unit**

The Office/Organization Unit module supports the registration and management of offices and organization unit data. It provides functionality for adding and updating information about offices, organization units, and their respective employees.

3. Modules and Flow Overview

This section provides an overview of the modules present in the website and their corresponding functionalities. Each module is assigned a priority level to indicate its importance in terms of testing. The priority levels are categorized as follows:

- Critical [C]: The website cannot function without this feature.
- High [H]: Malfunctioning of this functionality severely affects the website.
- Medium [M]: The website can still function with affected functionality but requires attention.
- Low [L]: The website operates normally even without this function.

The following table lists the number of functionalities assigned to each priority level.

Priority	**Number of Functionalities**
Critical	13
High	20
Medium	9
Low	5
Total	**47**

The modules overview below provides a detailed breakdown of the website's modules, including their functionalities and assigned priority levels.

	Module	Feature	Functionality	Priority
1.	Account Management			
1.1.		Admin Management	1.1.1. Logging in as admin	C
			1.1.2. Creation of new admin profile	H
			1.1.3. Creation of new user profile	C
			1.1.4. Changes to existing profiles	M
			1.1.5. Deletion of existing profiles	H
1.2.		User Management	1.2.1. Logging in as user	C
			1.2.2. Access to information on employees	C
			1.2.3. Access to information on equipment	C
			1.2.4. Access to reports	H
2.	Header and Footer			
2.1.		Header	2.1.1. Employees: Assignment and decommissioning of equipment	H
			2.1.2. Equipment	H
			2.1.3. Reports	H
			2.1.4. Type/Brand of equipment	M
			2.1.5. Office/Organization unit	M
			2.1.6. Administration of users	C
			2.1.7. Logout	H

2.2.		Footer	2.2.1. User manual	L
			2.2.2. Reports of user issues	L
			2.2.3. Contact	L
3.	Employees			
3.1.		Employee Management	3.1.1. Data entry for new employee	C
			3.1.2. Pie-chart graphic display of employees in organizational units	L
			3.1.3. Search tab for list of employees	M
			3.1.4. Navigation trough list of employees	H
			3.1.5. Changes to employee data	H
			3.1.6. Assignment and decommissioning of equipment	C
			3.1.7. Deletion of employee data	H
4.	Equipment			
4.1.		Equipment Management	4.1.1. Entry of new equipment	C
			4.1.2. Pie-chart graphic display of equipment	L
			4.1.3. Search tab for equipment	M
			4.1.4. Navigation trough list of equipment	H
			4.1.5. Change of information on equipment	H
			4.1.6. Deletion of equipment	H
5.	Reports			
5.1.		Report Generation	5.1.1. Reports on Equipment per Organization Unit	M
			5.1.2. Reports on Equipment per Office	M
			5.1.3. Reports on Equipment per Employee	M
			5.1.4. Reports on Available Equipment	M
6.	Type/Brand of Equipment			
6.1.		Equipment type management	6.1.1. Entry of New Type of Equipment	C
			6.1.2. Changes to type of equipment	H
			6.1.3. Deletion of Type of Equipment	H
6.2.		Equipment brand management	6.2.1. Entry of New Equipment Brand	C
			6.2.2. Changes to brand of equipment	H
			6.2.3. Deletion of Equipment Brand	H
7.	Offices/Organizational Units			
7.1.		Office management	7.1.1. Entry of New Office	C
			7.1.2. Changes to office data	H
			7.1.3. Deletion of Office	H
7.2.		Organizational Unit management	7.2.1. Entry of New Organizational Unit	C
			7.2.2. Changes to organizational units	H
			7.2.3. Deletion of Organizational Unit	H

4. Test Coverage

The testing process will encompass a variety of techniques to ensure comprehensive coverage of the website. It will primarily involve manual testing practices following industry-standard software testing methodologies. The following testing practices will be employed:

- Black Box Testing: This technique focuses on testing the functionality of the website without considering its internal structure or implementation details.
- Functional Testing: Functional testing aims to verify that each function and feature of the website operates correctly and performs as intended.
- Exploratory Testing: Exploratory testing involves a more ad-hoc and investigative approach, allowing testers to uncover potential issues and defects through real-time exploration of the website.
- Fuzz Testing: Fuzz testing involves injecting invalid, unexpected, or random data inputs to test the website's robustness and resilience against unexpected inputs.
- Negative Testing: Negative testing evaluates how the website handles invalid or incorrect inputs, error conditions, and edge cases to ensure appropriate error handling and system behavior.
- Security Testing: Security testing focuses on identifying vulnerabilities and weaknesses in the website's security measures, ensuring the protection of sensitive data and preventing unauthorized access.
- Usability Testing: Usability testing assesses the website's user-friendliness, intuitiveness, and ease of navigation to ensure a positive user experience.
- Performance Testing: Performance testing evaluates the website's performance under various load conditions, measuring factors such as response time, scalability, and resource utilization.

In addition to manual testing, certain components of the website will undergo automated testing. This includes functionalities related to account management and the addition or deletion of employee or equipment information. The automated tests will be developed using Visual Studio Code as the coding environment and Selenium WebDriver as the testing framework.

Furthermore, the API of website randomuser.me will be tested using Postman, ensuring the correctness and reliability of API requests and responses. Performance testing of our website will be conducted using Apache JMeter to assess the website's performance metrics, such as response time, load handling capacity, and resource utilization.

Overall, the testing approach combines both manual and automated techniques to achieve comprehensive test coverage, validating the functionality, usability, compatibility, security, and performance aspects of the website.

5. Conclusion

The testing process for the website Evidencija Racunarske Opreme has been successfully conducted in accordance with this plan, encompassing various testing techniques and tools. The objective of the testing was to ensure the functionality, reliability, usability, security, and performance of the website. This chapter provides a summary of the key findings, observations, and recommendations resulting from the testing process.

Summary of Findings:

169 manual tests have been run against the website. 59 of those failed. Of the failed tests 2 have been ranked as critical, 17 high, 32 medium and 8 low. The tests ranked critical are tests no. 3.1.6.3 and 3.1.6.7. – Neither administrator nor user are able to decommission equipment assigned to employee and this impacts the functionality and usability of the website. High priority failed test are mostly of the type: administrators, users, employees and equipment can be registered or changed with one or more missing information and that same administrators, users, employees and equipment can be registered multiple times.
From the aspect of user experience the website is user-friendly, intuitive, and easy to navigate. From security perspective the website is not accessible with invalid credentials.

Observations:

One observation that must be made is that none of the reports are functional. Also previously mentioned possibility of registration with missing information can potentially cause confusion and data integrity problems. Usage of irregular characters should be forbidden and in case of wrong input the user should be warned about it in time. Email and phone format conversions should be used.

Recommendations:

It is advisable that the developer solve as soon as possible the issue of decommissioning of equipment and reports generation. The problems that should be solved after that are the problems of invalid, missing and multiple entrees. Also all reports within reports module should be made functional so they could be tested in next regression.

Overall Assessment:

The website is not ready for production until the critical and high priority issues are resolved. Once those are resolved the website should prove very useful as it is user-friendly, intuitive, and easy to navigate.

Next Steps:

Because of diversity of failed tests in next iteration **full regression is strongly recommended.** In the meantime test automatization should be maximized to cover most of passed tests so regression would go fast and smooth and focus can be on manual testing of integrated missing functionalities.