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|  | **BAHRIA UNIVERSITY, (Karachi Campus)**  *Department of Software Engineering*  **Assignment 2 - Spring 2023** |  |



COURSE TITLE: **SOFTWARE QUALITY ENGINEERING** COURSE CODE: **SEN-321**

Class: **BSE-6 (B)** Shift: **Morning**

Course Instructor: Sohaib ur RehmanTime Allowed:  **1 Week**

Submission Date: **13th June 2023** Max. Marks: **5 Marks**

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**Question No. 1 [CLO2: 5 Marks]**

Assignment Title: QA Techniques

Task:

Assignment Description:

In this assignment, you will explore the fundamentals of Quality Assurance (QA) and demonstrate your understanding of its key concepts and principles. Your task is to analyze a given scenario and apply QA techniques to identify potential defects and propose solutions for improvement.

Assignment Guidelines:

**Scenario**: Imagine you are working on a team developing a mobile banking application. The application allows users to check their account balances, transfer funds, and view transaction history.

**Identify Potential Defects:** Analyze the mobile banking application scenario and identify potential defects or issues that users might encounter. Consider different aspects such as functionality, usability, performance, security, and compatibility.

**Defect Categorization:** Categorize the identified defects into appropriate categories based on their nature and impact on the application's functionality and user experience.

**Propose Solutions:** For each identified defect, propose a solution or improvement to address the issue. Explain how the proposed solution would resolve the defect and enhance the overall quality of the mobile banking application.

**Justification:** Provide a justification for each proposed solution, explaining why it is an effective approach to addressing the identified defect. Consider factors such as feasibility, impact on the user experience, and adherence to industry best practices.

**Evaluation Criteria:**

Your assignment will be evaluated based on the following criteria:

1. Thoroughness of defect identification, considering various aspects of the mobile banking application.
2. Accuracy and relevance of defect categorization, demonstrating a comprehensive understanding of different defect types.
3. Effectiveness and feasibility of proposed solutions, addressing the identified defects and improving the application's quality.
4. Clarity and coherence of justifications, providing solid reasoning for each proposed solution.

Submission Requirements:

Use reputable sources to research and support your answers and mentioned all references.

Your answers should be clear, concise, and free of errors.

Your assignment should be properly formatted with headings, subheadings, and lists where appropriate.

Your assignment should be 3-5 pages in length, double-spaced with 12 pt font size.

Submit a hard copy before 15 June 2023.

**Introduction:**

In this assignment, we will analyze a scenario involving the development of a mobile banking application. Our goal is to identify potential defects or issues that users may encounter and propose effective solutions to enhance the overall quality of the application. We will consider various aspects such as functionality, usability, performance, security, and compatibility. The proposed solutions will be justified based on feasibility, impact on the user experience, and adherence to industry best practices.

**Defect Identification:**

1. Functionality:
2. Incorrect balance calculation: The application may display inaccurate account balances due to incorrect calculations or synchronization issues with the backend system. This could lead to financial discrepancies for users.
3. Usability:
4. Poor navigation and menu structure: The application may have a confusing or non-intuitive navigation structure, making it difficult for users to find specific features or perform transactions easily.
5. Inconsistent user interface: The application may have inconsistent design elements, such as varying font sizes, color schemes, or button placements, which can confuse users and impact their overall experience.
6. Performance:
7. Slow response time: The application may exhibit slow response times when performing actions such as checking balances, transferring funds, or retrieving transaction history. This can lead to user frustration and dissatisfaction.
8. Security:
9. Insufficient authentication and authorization: The application may lack robust authentication mechanisms, making it vulnerable to unauthorized access and potential security breaches.
10. Insecure data transmission: The application may transmit sensitive user data over insecure channels, exposing it to potential interception and unauthorized access.
11. Compatibility:
12. Limited device and OS support: The application may not be compatible with a wide range of devices or operating systems, restricting access for users and limiting its market reach.

**Defect Categorization:**

1. Functionality:
2. Incorrect balance calculation
3. Usability:
4. Poor navigation and menu structure
5. Inconsistent user interface
6. Performance:
7. Slow response time
8. Security:
9. Insufficient authentication and authorization
10. Insecure data transmission
11. Compatibility:
12. Limited device and OS support

**Proposed Solutions:**

1. Functionality:
2. Incorrect balance calculation:

Solution: Implement rigorous testing and validation processes to ensure accurate balance calculations. Conduct regular reconciliation with the backend system to synchronize and verify account balances.

Justification: This solution addresses the defect by focusing on rigorous testing and validation, ensuring accurate balance calculations. Regular reconciliation with the backend system enhances data consistency and reliability, improving the user experience.

1. Usability:
2. Poor navigation and menu structure:

Solution: Conduct user experience (UX) research and design user-friendly navigation and menu structures based on industry best practices. Implement user testing to gather feedback and refine the navigation system.

Justification: This solution improves the user experience by addressing the poor navigation and menu structure. By conducting UX research and user testing, the application's usability will be enhanced, making it easier for users to find features and perform transactions.

1. Inconsistent user interface:

Solution: Develop and follow a comprehensive style guide to ensure consistent design elements throughout the application. Implement a design review process to validate compliance with the style guide.

Justification: By implementing a style guide and design review process, the application's user interface will become consistent. Consistency in design elements enhances user familiarity and improves the overall visual appeal and usability of the application.

1. Performance:
2. Slow response time:

Solution: Optimize server-side and client-side code to reduce latency and improve response times. Implement caching mechanisms for frequently accessed data. Load test the application to identify and address performance bottlenecks.

Justification: This solution focuses on optimizing code, implementing caching mechanisms, and load testing to improve performance and address the slow response time. By reducing latency and improving response times, users will experience faster and more efficient interactions with the application, leading to increased satisfaction and a better overall user experience.

1. Security:
2. Insufficient authentication and authorization:

Solution: Implement strong authentication mechanisms such as multi-factor authentication (MFA) and biometric authentication. Employ robust authorization controls to ensure that users can access only the features and data they are authorized for.

Justification: This solution enhances the security of the application by implementing strong authentication and authorization mechanisms. MFA and biometric authentication add an extra layer of protection against unauthorized access, while robust authorization controls ensure that users can only access the features and data they are entitled to, mitigating the risk of data breaches.

1. Insecure data transmission:

Solution: Implement secure communication protocols such as HTTPS to encrypt data during transmission. Utilize encryption algorithms to protect sensitive user data stored on the server and implement secure data storage practices.

Justification: By implementing secure communication protocols and encryption algorithms, the application ensures that sensitive user data is protected during transmission and storage. This solution mitigates the risk of data interception and unauthorized access, enhancing the overall security of the application.

1. Compatibility:
2. Limited device and OS support:

Solution: Conduct thorough market research to identify the most widely used devices and operating systems. Develop a comprehensive compatibility matrix and prioritize compatibility enhancements based on market demand.

Justification: This solution improves the application's compatibility by addressing the limited device and OS support. Conducting market research and developing a compatibility matrix help prioritize compatibility enhancements, ensuring that the application reaches a broader user base and remains competitive in the market.

**Conclusion:**

In this assignment, we analyzed a mobile banking application scenario and identified potential defects or issues across various aspects such as functionality, usability, performance, security, and compatibility. We proposed solutions for each defect, focusing on improving the overall quality of the application. The solutions were justified based on feasibility, impact on user experience, and adherence to industry best practices. By addressing these defects and implementing the proposed solutions, the mobile banking application can provide a more seamless, secure, and user-friendly banking experience for its users.

**References:**

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