



**BCS2363 SOFTWARE QUALITY ASSURANCE**  
**SESSION 2024/2025 SEMESTER I**

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**SECTION : 01A**

**SYSTEM : BOOKING CATERING MANAGEMENT SYSTEM**

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**ASSIGNMENT: SOFTWARE QUALITY ASSURANCE DESIGN (SQAD)**

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# 1.0 Abstract of Project

The Catering Management System is designed to streamline the process of ordering and managing catering services, providing an efficient platform for customers and catering service providers. This system centralizes operations, allowing users to request catering services, manage reservations and view catalogs to make package choices. The main goal is to improve the user experience by simplifying the booking process, reducing the administrative burden and ensuring timely communication between customers and suppliers.

The first module is Manage User Profiles, which focuses on managing user-related information effectively. This module allows users to create, update and manage their profiles, storing important data such as contact details, preferences and booking history. By maintaining accurate and up-to-date user profiles, the system can offer personalized services, streamline communications and ensure smooth interactions within the platform. The module also integrates security features, protects user data and provides role-based access control to improve system reliability.

Overall, the Catering Management System offers an intuitive and secure solution for catering management, promoting user satisfaction and operational efficiency.

## 2.0 Introduction

In the modern catering industry, efficient management of reservations, customer preferences and user interactions are essential to deliver a seamless service experience. Recognizing the need for an organized and user-first approach, we present the Catering Management System, a solution specifically designed to streamline the catering booking process. The system emphasizes quality design principles, focusing on ease of use,

operational efficiency, and data security to meet the needs of both customers and catering providers.

At the heart of this Catering Management System is the Manage User Profile module, an important component dedicated to handling user accounts and personal information. The module is designed with a user-centric approach, ensuring that every user's information is stored accurately and easily accessible, setting the stage for a customized and efficient catering booking experience. By allowing users to register, update and manage their profiles, the system creates the basis of personalized interactions. Details such as user information, preferences and booking history are maintained securely, facilitating tailored and efficient service for each customer.

In addition to data management, the Manage User Profile module incorporates security features to protect sensitive information, including role-based access controls and data privacy protocols, enhancing the system's reliability and user trust. This focus on safeguarding user information not only complies with modern data protection standards but also creates a secure environment that promotes user confidence.

In summary, the Catering Management System, through its Manage User Profile module, delivers a balanced integration of technology and thoughtful design, driving efficiency and personalization in catering services. By prioritizing user experience, operational effectiveness, and data security, the system provides a robust solution that enhances the overall catering experience for both clients and service providers.

## 3.0 Background of Study

In today's fast-paced catering industry, the demand for efficient, organized, and user-friendly booking systems is more critical than ever. Traditional methods of managing catering orders, including manual booking, phone calls, and physical paperwork, are not only time-consuming but also prone to errors and inefficiencies. This often leads to client dissatisfaction, miscommunication, and logistical challenges, which can ultimately impact a catering business's reputation and operational success. Recognizing these challenges, the need for an effective digital solution that streamlines booking, manages client preferences, and enhances service delivery is evident.

The Catering Management System is developed to address these industry challenges by providing a centralized, digital platform that caters to both clients and service providers. The

system focuses on delivering an efficient user experience while ensuring that essential client information is securely managed. A quality design approach guides the system’s development, emphasizing user-centric interfaces, robust functionality, data security, and adaptability to changing client demands and event trends.

At the core of the system, the Manage User Profile module plays a vital role in building personalized client experiences. By allowing clients to create, update, and maintain their profiles, the system ensures that client preferences, past orders, and contact information are easily accessible for streamlined service. This module incorporates secure authentication, encryption of sensitive data, and role-based access to protect user information, aligning with industry best practices for data protection and privacy.

Furthermore, implementing a Software Quality Assurance (SQA) framework is essential to guarantee that the Catering Management System meets high standards for functionality, security, and user satisfaction. SQA practices, including requirements analysis, rigorous testing, continuous monitoring, and feedback collection, help ensure that the system not only meets but exceeds user expectations. By incorporating quality assurance and focusing on quality design, this system aims to transform the catering booking process, promoting a seamless, user-friendly experience that ultimately supports business growth and client satisfaction in the modern catering industry.

## 4.0 Introduction of quality attribute

The Booking Catering Management System is designed with a focus on key quality attributes to ensure a high standard of performance, usability, and security. These attributes act as guiding principles during the system's design and development, ensuring the solution meets user expectations and industry standards. At the core of the system, the Manage User Profile module plays a pivotal role in maintaining user-related data, ensuring secure access, and supporting system scalability. Below are the primary quality attributes considered.

| Quality Attributes | Definition   | Example  |
|--------------------|--|--|
| Security           | Measures implemented to protect data and prevent unauthorized access or breaches.            | Encrypted login credentials and role-based access ensure only authorized users can access sensitive information. |
| Scalability        | The ability of the system to handle increased workloads, users, and data without performance | Supporting 1,000 concurrent users during peak booking periods  |

|             |  |   |
|-------------|--|---|
|             | issues. Click or tap here to enter text..  | without slowing down the system.  |
| Testability | The ease with which the system can be tested to ensure functionality, performance, and security. | Modular design allows individual components, like user authentication, to be tested independently for bugs. |

## 5.0 Quality attributes scenario in your project.

### Manage User Profile Module: Security (Authenticity)

#### Scenario 1

| Items            | Description  |
|------------------|--|
| Source           | Users attempting to access or modify their profile within the Manage User Profile module.                                      |
| Stimulus         | Users attempt to log in or update their profile with potentially invalid or unauthorized credentials.                          |
| Environment      | The Booking Catering Management System's authentication system during login or profile update actions.                         |
| Artifact         | Login form, profile update form, and authentication system (username, password, two-factor authentication).                    |
| Response         | The system verifies user identity through credentials, ensuring that only authorized users can access or modify their profile. |
| Response Measure | - Successful login and profile access only when valid credentials are entered.   |
|                  | Prompting the user to re-enter credentials or complete additional authentication (e.g., two-factor) when necessary.            |

### Manage User Profile Module: Security (Detecting Unauthorized Access Attempts)

#### Scenario 2

| Items       | Description  |
|-------------|--|
| Source      | A malicious actor or unauthorized user attempting to gain access to a profile within the Manage User Profile module. |
| Stimulus    | The unauthorized user enters incorrect credentials multiple times, attempting to guess the username and password.    |
| Environment | The Booking Catering Management System's authentication system under potentially malicious login attempts.           |

|                  |   |
|------------------|---|
| Artifact         | Login form, authentication server, and intrusion detection system (e.g., monitoring failed login attempts).   |
| Response         | The system detects multiple failed logins attempts and triggers an account lockout mechanism, notifying the legitimate user of suspicious activity. |
| Response Measure | User accounts are locked after a specific number of failed login attempts (e.g., 5).  |

### **Manage User Profile Module: scalability (Performance Under Load)**

#### **Scenario 1**

| Items            | Description  |
|------------------|--|
| Source           | A large number of users simultaneously access the Manage User Profile module.  |
| Stimulus         | Thousands of users attempt to create, update, or access their profiles concurrently, especially during peak usage times or promotional events. |
| Environment      | The Booking Catering Management System's production environment, supporting multiple concurrent users in real-time.                            |
| Artifact         | Backend services, databases, and front-end interface of the Manage User Profile module.  |
| Response         | The system efficiently processes simultaneous requests without performance degradation, ensuring a smooth experience for all users.            |
| Response Measure | The system can handle a high volume of concurrent requests (e.g., 10,000 simultaneous users).  |

### **Manage User Profile Module: scalability (Handling Sudden Spikes in Traffic)**

#### **Scenario 2**

| Items       | Description   |
|-------------|---|
| Source      | A sudden surge in users accessing the Manage User Profile module  |
| Stimulus    | Tens of thousands of users attempt to log in and update their profiles simultaneously, creating a sudden spike in server traffic. |
| Environment | The Booking Catering Management System's production environment, operating under high-load conditions.                            |

|                  |   |
|------------------|---|
| Artifact         | Load balancers, server clusters, and the database supporting the Manage User Profile module.  |
| Response         | The system dynamically allocates additional server resources using cloud scalability solutions and employs load balancing to distribute traffic evenly across servers, ensuring consistent performance. |
| Response Measure | No downtime or service interruptions are experienced during the traffic spike.  |

### Manage User Profile Module: Testability (Ease of Testing)

#### Scenario 1

| Items            | Description  |
|------------------|--|
| Source           | Quality assurance engineers or developers testing the Manage User Profile module.  |
| Stimulus         | The need to verify that the module's functionalities (e.g., profile creation, update, and access) work as expected under various conditions.             |
| Environment      | Development or testing environment with tools for automated and manual testing, including mock data and test cases.                                      |
| Artifact         | Manage User Profile module, including its input forms, validation rules, and database interactions.  |
| Response         | The system allows for efficient and isolated testing of its components, ensuring bugs and inconsistencies are identified and resolved before deployment. |
| Response Measure | Test results are consistent, reproducible, and provide actionable feedback.  |
|                  | Test coverage includes at least 95% of the module's features.  |

### Manage User Profile Module: Testability (Validation Testing for Input Fields)

#### Scenario 2

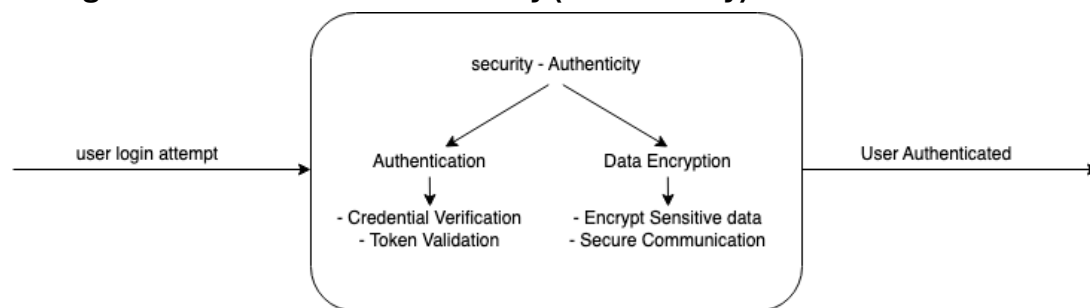
| Items       | Description  |
|-------------|--|
| Source      | Quality assurance engineers validating the input fields for the Manage User Profile module.  |
| Stimulus    | Simulating various invalid inputs (e.g., incorrect formats, missing required fields) to ensure the module's validation rules are enforced correctly. |
| Environment | A controlled testing environment with automated testing tools (e.g., Postman) and predefined invalid input datasets.                                 |



|                  |   |
|------------------|---|
| Artifact         | Manage User Profile module's input forms, validation rules, and error message system.   |
| Response         | The system identifies invalid inputs and provides clear, actionable error messages to guide users in correcting their entries. Validation rules work as intended without bypasses or inconsistencies. |
| Response Measure | Error messages are consistent, clear, and actionable.   |

## 6.0 Tactics for each attribute

### Manage User Profile Module: Security (Authenticity) Scenario



### Security (Authenticity)

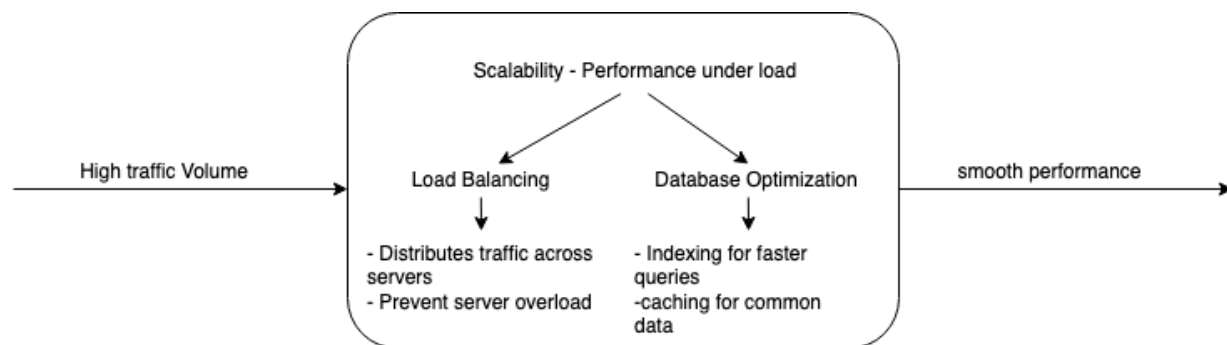
#### Authentication

- Credential Verification**  
 Ensures that the username and password provided by the user match the records in the system. This includes verifying against hashed passwords in the database.
- Token Validation**  
 Checks the validity of authentication tokens (e.g. API tokens, or session tokens) to ensure they are not expired or tampered with.

#### Data Encryption

- Encrypt Sensitive Data**  
 Secures sensitive information, such as passwords and personal data by encrypting them before storage or transmission, preventing unauthorized access.
- Secure Communication**  
 Ensures all communication between the client (user) and server is conducted through secure protocols like HTTPS or TLS to protect data from interception or eavesdropping.

## Manage User Profile Module: scalability (Performance Under Load) Scenario



### High Traffic Volume

- Represents the scenario where thousands of users simultaneously attempt to access, create, or update their profiles during peak usage times, such as promotional events or peak hours.

### Scalability - Performance Under Load

- This is the central process where scalability tactics are applied to ensure the system performs efficiently under heavy load. The focus is on preventing performance degradation and maintaining smooth user experience.

### Sub-Processes (Scalability Tactics)

### Load Balancing

- Distributes incoming user requests evenly across multiple servers.
- Prevents any single server from becoming overloaded, ensuring consistent performance for all users.

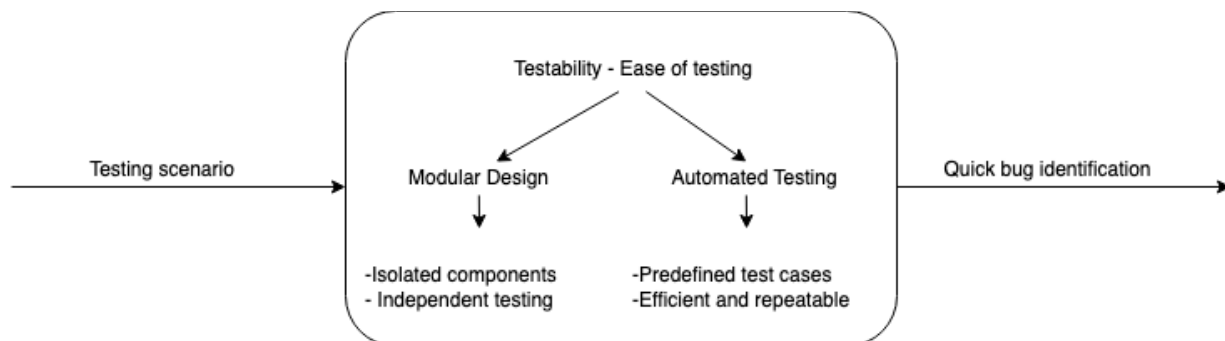
### Database Optimization

- Implements indexing to make data retrieval faster by reducing the amount of time required to search large datasets.
- Uses caching to store frequently accessed data temporarily, reducing the need for repetitive database queries.

### Response: Smooth Performance

- The system processes simultaneous user requests efficiently, maintaining fast response times and a seamless user experience even under heavy traffic.

### Manage User Profile Module: Testability (Ease of Testing) Scenario



#### 1. Testing Scenarios

- Represents the input conditions where the system is tested to ensure functionality, performance, and security.
- These scenarios include unit tests, integration tests, and stress tests designed to validate specific parts of the module.

#### 2. Testability - Ease of Testing

- This is the central process where testability tactics are applied to simplify and enhance the testing process. The goal is to quickly identify and resolve issues within the system.

#### 3. Processes (Testability Tactics)

##### a. Modular Design

- i. Breaks the system into smaller, independent components. For example:
  - Profile creation, update, and validation logic are isolated from other parts of the system.
- ii. Each component can be tested individually without affecting the rest of the system.

**b. Automated Testing**

- i. Uses predefined test cases that can be executed automatically, saving time and ensuring consistency.
- ii. Examples include:
  - Automated input validation tests to ensure that incorrect data is rejected.
  - Automated tests to verify the module's response under load or edge cases.

**4. Response: Quick Bug Identification**

- The system's design and automated testing allow for rapid detection of issues.
- Developers can quickly identify which component or feature is causing an error, minimizing downtime and improving the development cycle.

## 7.0 Conclusion

In conclusion, the Manage User Profile module is a vital component of the Booking Catering Management System, ensuring secure and efficient management of user data. By integrating robust security measures such as authentication and encryption, the module protects sensitive information and prevents unauthorized access. These features enhance the overall system integrity and build trust among users.

The module's scalability is designed to handle large numbers of concurrent users without performance degradation. Through strategies like load balancing, database optimization, and dynamic resource scaling, the system ensures consistent functionality even during peak usage periods. This capability supports seamless user interactions while preparing the system for future growth and increasing demands.

Furthermore, the focus on testability ensures the reliability of the module by enabling efficient validation and debugging processes. Modular design and automated testing allow

for rapid identification and resolution of issues, guaranteeing smooth and dependable operation. These attributes make the Manage User Profile module a cornerstone for the Booking Catering Management System, contributing to its success in delivering a robust and user-friendly platform.

## 8.0 References

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