**ASTANA IT UNIVERSITY**

**SOFTWARE QUALITY ASSURANCE**

**TEST REQUIREMENTS FOR DATABASE TESTING**

**Project Name:** Customer Relationship Management Database Testing

**Test Plan ID:**  DBT-001

**Version:**  1.0

**Date Prepared:** 31.05.2023

**Last Updated By:** Darmenkyzy Nurbakyt

**Last Updated Date:** 01.06.2023

**Test Environment:** PostgreSQL 14

**Testing Approach:** Manual testing

**Test Coverage:** Data integrity, Data retrieval, Security

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**Link from Roadmap:** Link

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**1. INTRODUCTION**

This is a comprehensive guide to outline the necessary tests required to validate the functionality, security, and reliability of the database system. This document aims to define the test requirements, set the context, and provide a clear understanding of the scope and structure of the testing process.

**1.1 Purpose**

The purpose of this document is to establish test requirements for conducting effective and efficient database testing. It outlines the specific objectives and goals of the testing process, ensuring that all relevant aspects of the database system are thoroughly examined and validated.

**1.2 Scope**

The scope of this document encompasses the identification and description of the key test requirements for the database testing. It includes a wide range of areas such as data integrity, data retrieval, security and data migration. By addressing these aspects, the document ensures comprehensive coverage of the database testing process, allowing for a robust evaluation of the system's capabilities.

**2. TEST REQUIREMENTS**

The specific test specifications for the database testing are described in this section. Each requirement is given a special identification number and is specified along with the test cases, acceptance standards, and status that go with it. The table below provides a table for test requirements:

| **Requirement ID** | **Requirement Description** | **Test Cases Executed** | **Test Case Status** |
| --- | --- | --- | --- |
| DBT-REQ-001 | Database should support CRUD operations for customer data | TC001, TC002, TC003, TC004, TC005 | Passed |
| DBT-REQ-002 | Data integrity should be maintained in the database | TC006, TC007, TC008 | Passed |
| DBT-REQ-003 | Database should verify the secure storage of data and ensure protection. | TC007, TC008, TC009 | Passed |

**3. ASSUMPTIONS AND DEPENDENCIES**

This section helps to establish a clear understanding of the underlying conditions and requirements necessary for the successful execution of the tests.

Assumptions:

It is assumed that the database system is installed correctly and configured according to the recommended specifications and guidelines provided by the vendor.

Required access privileges and permissions are granted to the testing team. This includes permissions to create, read, update, and delete data, as well as the ability to modify database settings and configurations.

It is assumed that suitable test data is available for conducting the database tests. The test data should accurately represent the real-world scenarios and cover a wide range of possible data inputs and scenarios to ensure comprehensive testing coverage.

Dependencies:

Availability of test environment, including hardware and software resources.

Completion of any prerequisite tasks or activities before initiating the testing process.

Timely availability of any dependent components or systems required for testing.

**4. TESTING APPROACH**

**4.1.Test Levels**

1. Unit Testing:

Validate the correctness and functionality of individual database units, such as stored procedures, triggers, or functions.

2. Integration Testing:

To test the integration and interaction between different database components.

3. Acceptance Testing:

Ensure that the database system meets the user's expectations, performs as intended, and delivers the required functionalities.

**4.2.Test Types**

1. Functional Testing:

Verify that the database system behaves correctly and performs the queries.

2. Security Testing:

Identify vulnerabilities, verify secure data storage, and test user access controls.

3. Data Integrity Testing:

Ensure that the database maintains data integrity, enforces constraints, and performs appropriate data validation.

**4.3.Test Techniques**

1. White-box Testing:

Testing the internal structure and logic of the database system, including code-level testing. Verifying the accuracy and correctness of database functions, stored procedures, and triggers.

2. Error Guessing:

Testing the database system based on the tester's intuition and past experience to identify potential errors or issues.

**4.4.Test Coverage**

1. Data Integrity:

Validating primary key constraints, foreign key relationships, referential integrity, and data consistency.

2. Data Retrieval:

Testing the accuracy and performance of data retrieval queries, joins, filters, and sorting.

3. Security:

Testing secure storage of data, user access controls and permissions, protection against data breaches, and vulnerability assessments.

**5. TEST ENVIRONMENT**

**5.1.Hardware Requirements**

Server Hosting the Database:

Processor: Dual-core or higher

RAM: 4 GB or higher

Storage: 8GB or higher

Network Interface: Ethernet or higher for network connectivity

Client Machines:

Processor: Dual-core or higher

RAM: 4 GB or higher

Storage: 8GB or higher

Network Interface: Ethernet or higher for network connectivity

**5.2.Software Requirements**

Database management system: PostgreSQL

Version: 14

Software tool: pgAdmin

Operating system: Macbook Pro 13

**5.3.Test Data**

1. Types of Data:

Customer information, product data, payment records, user roles

2. Data Generation Approach:

Test data can be manually created using queries and specific data values.

3. Data Privacy and Security Considerations:

Ensure that any sensitive data transmitted or stored in the testing environment is encrypted to prevent unauthorized access.

4. Data Volume and Variety:

Consider generating test data to assess the scalability of the database system.

**TEST SCHEDULE**

| **Test Description** | **Start date** | **Finish date** | **Assigned** |
| --- | --- | --- | --- |
| Functionality Testing | 31.05.2023 | 01.06.2023 | Abu Mariyam |
| Data Integrity Testing | 31.05.2023 | 01.06.2023 | Amangeldi Aruzhan |
| Security Testing | 31.05.2023 | 01.06.2023 | Darmenkyzy Nurbakyt |

**CHANGE HISTORY**

| **Name and Surname** | **Updated date** | **Changes** |
| --- | --- | --- |
| Amangeldi Aruzhan | 01.06.2023 | Approved |
| Abu Mariyam | 01.06.2023 | Approved |
| Darmenkyzy Nurbakyt | 01.06.2023 | Approved |

**APPROVALS**

| **Name and Surname** | **Updated date** | **Status** |
| --- | --- | --- |
| Amangeldi Aruzhan | 01.06.2023 | Approved |
| Abu Mariyam | 01.06.2023 | Approved |
| Darmenkyzy Nurbakyt | 01.06.2023 | Approved |

**REFERENCES**

pgAdmin 4 Documentation - <https://www.pgadmin.org/docs/pgadmin4/7.0/index.html>

Jira Software - <https://support.atlassian.com/jira-software-cloud/resources/>

PostgreSQL - <https://www.postgresql.org/docs/14/index.html>