UE22CS341A: Software Engineering
Case Study

Unit 1 Deliverable

A Software Requirements Specification (SRS) document for an **Music Shop DBMS using the Incremental development model**. Below is an outline of the SRS document, along with an example of a Requirements Traceability Matrix (RTM).

SRS Document for Music Shop DBMS:

1. Introduction

1.1 Purpose

This document specifies the requirements for the Music Shop DBMS. The system allows music shop vendors to manage the inventory of their stock and keep track of transactions and the movement of supplies.

1.2 Scope

The Music Shop DBMS is designed for use by music shop vendors, providing a user friendly interface for the tracking of their inventory. It interacts with the store's central database and other systems to update the database.

1.3 Definitions, Acronyms, Abbreviations

MS-DBMS: Music Shop Database Management System

1.4 References

- Database System Concepts 7th Edition Sudarshan and Korth
- Fundamentals of Database Systems 7th Edition Elmasri and Navathe

1.5 Overview

The document is structured into sections detailing the functional and non functional requirements, system features, external interface requirements, and more.

2. Overall Description

2.1 Product Perspective

The MS-DBMS is part of the store's existing infrastructure, connected to a central database and the stores online website store.

2.2 Product:

Functions:

- Track and monitor inventory
- Add records
- Delete records
- Update Records
- Track orders

2.3 User Classes and Characteristics

- The staff present in the music store
- Administration team to do maintenance work on the database

2.4 Operating Environment:

- Software: The database application which the users will access in order to view and keep track of the stock.
- Hardware: The computers present in the store on which the software will run.

2.5 Design and Implementation Constraints:

- Compliance with the stores existing

  online store.
- Accurate and fast updation of data.
- Usability and accessibility standards

2.6 Assumptions and Dependencies:

- The MS-DBMS assumes that the store already has an existing central database, online store page from which the stock can be tracked..
- Regular software and hardware maintenance is performed.

3. External Interface Requirements

3.1 User Interfaces:

- Computer interface for user interaction.
- Different views depending on the type of the user
- Easily usable and high readability

3.2 Hardware:

- Computer System
- Server System for database

3.3 Software Interfaces

- Access to the central database list of inventory stock
- Access to the stores online store

3.4 Communication Interfaces

Secure protocols like SSL/TLS for data transmission

4. System Features

4.1 Authentication

4.1.1 Description: The system requires users to authenticate the user level with a password.

4.1.2 Functional Requirements:

The system shall validate the entered password against the stored password in the database. The system shall lock the account after three failed attempts.

4.2 Access, View and Edit the database in compliance with the current store's inventory stock.

4.2.1 Functional Requirements:

The system shall check the number of items in the inventory.

The system shall update the supplies present in the inventory as they are transferred between warehouses, stores and sales.

The system shall have the ability to add more entries into the database.

4.3 Error Handling

4.3.1 Description: Handles errors such as network failures or invalid inputs.

4.3.2 Functional Requirements:

The system shall notify the user of any errors during a transaction/transfer. The system shall log all errors for later analysis.

5. Non Functional Requirements

4.4 Performance Requirements

The system shall respond to user inputs within 2 seconds.

The system shall complete a transaction within 5 seconds, excluding network delays.

4.5 Security Requirements

The system shall encrypt all user data during transmission.

The system shall require multi factor authentication for administrators.

4.6 Usability Requirements

The system shall provide an intuitive and user friendly interface.

4.7 Reliability Requirements

The system shall have an uptime of 99.9%.

5. Other Requirements

5.1 Regulatory Requirements

The system shall comply with store regulations and data protection laws.

5.2 Environmental Requirements

The system shall be operational under a temperature range of 10°C to 40°C.

Requirements Traceability Matrix (RTM)

The RTM ensures that all requirements are covered by design, development, and testing activities. Below is a simplified RTM.

Requirement ID	Requirement Description	Functional Specification	Design Specification	Test Case ID	Verification Method
FR-01	System must store musical instruments (name, type, brand, price, stock)	DB Table for Instruments	ER Diagram for Instruments Table	TC-01	Database validation and CRUD operations
FR-02	System must store customer information (name, contact details, purchase history)	DB Table for Customers	ER Diagram for Customers Table	TC-02	Add/edit/delete customer info, verify purchase history
FR-03	System must allow customers to search instruments by name, type, or brand	Search functionality in UI	Search UI Mockup, SQL Queries	TC-03	Test instrument search filters
FR-04	System must allow customers to purchase instruments and store purchase details	Purchase process flow, cart functionality	ER Diagram for Sales, Cart Workflow	TC-04	End-to-end purchase flow validation
FR-05	System must track instrument inventory levels	Inventory Management Module	ER Diagram for Inventory	TC-05	Validate inventory levels on purchase

Requirement ID	Requirement Description	Functional Specification	Design Specification	Test Case ID	Verification Method
NFR-01	System must perform all operations within 3 seconds	Performance Criteria	Performance Testing Plan	TC-13	Test response time for major actions
NFR-02	System must handle up to 1000 concurrent users	Scalability Requirement	System Load Diagram	TC-14	Load testing for concurrent users
NFR-03	Data should be encrypted during payment transactions	Security Requirement	Payment Encryption Design	TC-15	Security testing on payment transactions
NFR-04	System should be available 99.9% of the time	Uptime Requirement	High Availability Architecture	TC-16	Monitor system uptime and availability
NFR-05	System must allow data backup and restore	Backup/Restore Functionality	Backup Workflow Design	TC-17	Test backup and restore operations

Each entry in the RTM links a functional or nonfunctional requirement to a specific design specification, implementation module, and test case, ensuring that all requirements are accounted for throughout the project lifecycle.