



## **UE22CS341A: Software Engineering Case Study**

### **Unit 1 Deliverable**

A Software Requirements Specification (SRS) document for an **Online Retail Database Management System**. Below is an outline of the SRS document, along with an example of a Requirements Traceability Matrix (RTM).

### **SRS Document for Online Retail Database Management System**

#### **1. Introduction**

##### **1.1 Purpose**

This document specifies the requirements for the Online Retail Database Management System, currently in its initial development phase( Revision 1.0) . The system is intended to manage inventory, customer orders, product details, and transactional records for an online retail platform. It facilitates operations such as product management, order processing, customer management, and report generation.

##### **1.2 Scope**

The Online Retail Database Management System is designed for use by retail companies to streamline their online operations. The system provides a secure and efficient way to manage and retrieve retail data. It interacts with external systems such as payment gateways and shipping providers to ensure smooth business transactions.

##### **1.3 Definitions, Acronyms, and Abbreviations**

- SKU: Stock Keeping Unit
- DBMS: Database Management System
- UI: User Interface
- API: Application Programming Interface
- ERP: Enterprise Resource Planning

##### **1.4 References**

- IEEE Standard for Software Requirements Specifications (IEEE Std 830 1998)
- E-commerce Database Design Documentation
- <https://ieeexplore.ieee.org/abstract/document/9417913>

## 1.5 Overview

This document is organised into sections detailing the functional and non-functional requirements, system features, external interface requirements, and additional details related to the Online Retail Database Management System.

## 2. Overall Description

### 2.1 Product Perspective

The Online Retail Database Management System is a core component of the online retail platform, connected to other systems such as inventory management, order fulfilment, and customer relationship management (CRM). It serves as the central repository for all retail-related data and is accessible through secure APIs.

### 2.2 Product Functions

- Product Management: Add, update, delete, and search for products.
- Order Management: Process customer orders, update inventory, and manage order statuses.
- Customer Management: Maintain customer profiles, track purchase history, and manage customer interactions.
- Report Generation: Generate sales, inventory, and customer reports for analysis.
- Payment Processing: Interface with payment gateways to handle transactions.
- Error Handling: Manage errors and provide notifications to users.

### 2.3 User Classes and Characteristics

- Administrators: Responsible for managing the overall system, including user access and system settings.
- Retail Managers: Oversee product listings, inventory, and sales reports.
- Customer Service Representatives: Handle customer queries and process returns.
- Customers: End-users who browse products and place orders.

### 2.4 Operating Environment

- Software: Web-based application running on a cloud platform.
- Hardware: Servers with database storage and high availability configurations.
- Network: Secure internet connection with SSL/TLS encryption.

### 2.5 Design and Implementation Constraints

- Compliance with data protection regulations such as GDPR.
- Integration with third-party APIs for payment processing and shipping.
- Scalability to handle large volumes of transactions during peak times.

### 2.6 Assumptions and Dependencies

- Stable internet connection for accessing the online retail platform.
- Regular maintenance and updates to ensure system reliability and security.

### 3. External Interface Requirements

#### 3.1 User Interfaces

- Web Interface: Dashboard for administrators and managers to access system features.
- Customer Interface: E-commerce website where customers can browse products and place orders.

#### 3.2 Hardware Interfaces

- Servers: Centralised database servers connected to web servers and payment gateways.
- Point of Sale (POS) Systems: Optional integration with physical retail stores.

#### 3.3 Software Interfaces

- API Integration: Interfaces with payment gateways, shipping providers, and CRM systems.
- Database Interfaces: SQL-based access to retrieve and manage data.

#### 3.4 Communication Interfaces

- Secure Protocols: Use of HTTPS for web traffic and SSL/TLS for database connections.

### 4. System Features

#### 4.1 Product Management

4.1.1 Description: Manage product listings, including details such as SKU, price, description, and stock levels.

##### 4.1.2 Functional Requirements:

- The system shall allow adding new products with all necessary details.
- The system shall enable updating existing product information.
- The system shall remove discontinued products from the active listings.
- The system shall allow searching for products based on various criteria.

#### 4.2 Order Management

4.2.1 Description: Manage customer orders from placement to fulfilment.

##### 4.2.2 Functional Requirements:

- The system shall process customer orders and update inventory accordingly.
- The system shall provide order tracking information to customers.

- The system shall handle order cancellations and returns.

### 4.3 Customer Management

4.3.1 Description: Maintain customer profiles and manage their interactions with the platform.

#### 4.3.2 Functional Requirements:

- The system shall store customer details, including contact information and purchase history.
- The system shall allow customers to update their profiles.
- The system shall manage customer communications and support requests.

### 4.4 Report Generation

4.4.1 Description: Generate reports for sales, inventory, and customer insights.

#### 4.4.2 Functional Requirements:

- The system shall generate daily, weekly, and monthly sales reports.
- The system shall provide inventory status and alerts for low-stock items.
- The system shall generate customer analytics reports for marketing purposes.

### 4.5 Payment Processing

4.5.1 Description: Interface with payment gateways to handle online transactions.

#### 4.5.2 Functional Requirements:

- The system shall securely process payments through integrated payment gateways.
- The system shall update the order status upon successful payment.
- The system shall handle payment errors and notify customers.

### 4.6 Error Handling

4.6.1 Description: Manage system errors and provide feedback to users.

#### 4.6.2 Functional Requirements:

- The system shall log all errors for further analysis.
- The system shall notify users of any errors encountered during transactions.

## 5. Non-Functional Requirements

### 5.1 Performance Requirements

- The system shall process orders within 3 seconds.
- The system shall handle up to 10,000 simultaneous users during peak times.

### 5.2 Security Requirements

- The system shall encrypt all customer data during storage and transmission.
- The system shall implement role-based access control for different user types.

### 5.3 Usability Requirements

- The system shall provide an intuitive interface for all user classes.
- The system shall support multiple languages for global accessibility.

### 5.4 Reliability Requirements

- The system shall maintain 99.9% uptime to ensure availability.

## 6. Other Requirements

### 6.1 Regulatory Requirements

- The system shall comply with relevant data protection and e-commerce regulations.

### 6.2 Environmental Requirements

- The system shall operate in a cloud environment with a stable temperature range of 15°C to 30°C.

## Requirements Traceability Matrix (RTM)

The RTM ensures that all requirements are covered by design, development, and testing activities. 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. Below is a simplified RTM example for the Online Retail Database System:

Requirement ID	Description	Design Specification	Implementation Module	Test Case ID
FR-1				
FR-2				
FR-3				
FR-4				
FR-5				
FR-6				
FR-7				
FR-8				
FR-9				
FR-10				
NFR-01				
NFR-02				
NFR-03				