UE22CS341A: Software Engineering
Case Study

Unit 1 Deliverable

A Software Requirements Specification (SRS) document for an **Automated Teller Machine (ATM) system using the Waterfall**. Below is an outline of the SRS document, along with an example of a Requirements Traceability Matrix (RTM).

SRS Document for ATM System

1. Introduction

1.1 Purpose

This document specifies the requirements for the Automated Teller Machine (ATM) system. The system allows bank customers to perform various transactions such as cash withdrawals, balance inquiries, fund transfers, and deposits.

1.2 Scope

The ATM system is designed for use by bank customers, providing a secure and user friendly interface for financial transactions. It interacts with the bank's central database and other systems to complete transactions.

1.3 Definitions, Acronyms, and Abbreviations

ATM: Automated Teller Machine

PIN: Personal Identification Number

UI: User Interface

API: Application Programming Interface

1.4 References

IEEE Standard for Software Requirements Specifications (IEEE Std 830 1998)

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 ATM system is part of the bank's existing infrastructure, connected to a central database and other banking systems through secure channels.

2.2 Product Functions

Authentication via PIN

Cash withdrawal

Balance inquiry

Fund transfer between accounts

Deposits

Printing of mini statements

Error handling and notification

2.3 User Classes and Characteristics

Regular bank customers with ATM cards

Administrators for maintenance and troubleshooting

2.4 Operating Environment

Software: Runs on secure ATM software compatible with the bank’s core banking system

Hardware: ATMs equipped with card readers, keypads, cash dispensers, printers, and screens

2.5 Design and Implementation Constraints

Compliance with banking regulations

Secure data transmission

Usability and accessibility standards

2.6 Assumptions and Dependencies

The ATM system assumes the availability of a stable network connection to the bank's central database.

Regular software and hardware maintenance is performed.

3. External Interface Requirements

3.1 User Interfaces

Touchscreen interface for customer interaction

Physical keypad for PIN entry

Printer for receipts and mini statements

3.2 Hardware Interfaces

Card reader

Cash dispenser

Receipt printer

Network interface for backend communication

3.3 Software Interfaces

API integration with the bank's core system for transactions

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 using a valid ATM card and PIN.

4.1.2 Functional Requirements:

The system shall validate the entered PIN against the stored PIN in the database.

The system shall lock the account after three failed attempts.

4.2 Cash Withdrawal

4.2.1 Description: Allows users to withdraw cash from their account.

4.2.2 Functional Requirements:

The system shall check the available balance before dispensing cash.

The system shall update the account balance after the transaction.

The system shall dispense the requested amount if it is within daily limits.

4.3 Balance Inquiry

4.3.1 Description: Allows users to check the balance of their account.

4.3.2 Functional Requirements:

The system shall display the account balance on the screen.

The system shall offer an option to print a mini statement.

4.4 Fund Transfer

4.4.1 Description: Allows users to transfer funds between accounts.

4.4.2 Functional Requirements:

The system shall validate the target account number.

The system shall update both accounts after the transfer.

4.5 Deposit

4.5.1 Description: Allows users to deposit cash or checks into their account.

4.5.2 Functional Requirements:

The system shall validate the deposit amount and credit the account.

The system shall print a deposit receipt.

4.6 Error Handling

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

4.6.2 Functional Requirements:

The system shall notify the user of any errors during a transaction.

The system shall log all errors for later analysis.

5. Non Functional Requirements

5.1 Performance Requirements

The system shall respond to user inputs within 2 seconds.

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

5.2 Security Requirements

The system shall encrypt all user data during transmission.

The system shall require multi factor authentication for administrators.

5.3 Usability Requirements

The system shall provide an intuitive and user friendly interface.

The system shall support multiple languages.

5.4 Reliability Requirements

The system shall have an uptime of 99.9%.

6. Other Requirements

6.1 Regulatory Requirements

The system shall comply with local banking regulations and data protection laws.

6.2 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 example for the ATM system:

Requirement ID	Description	Design Specification	Implementation Module	Test Case ID
FR-1	User Authentication via PIN	DS-1.1	IM-1	TC-1.1
FR-2	Cash Withdrawal	DS-2.1	IM-2	TC-2.1
FR-3	Balance Inquiry	DS-3.1	IM-3	TC-3.1
FR-4	Fund Transfer	DS-4.1	IM-4	TC-4.1
FR-5	Deposit	DS-5.1	IM-5	TC-5.1
FR-6	Error Handling	DS-6.1	IM-6	TC-6.1
NFR-1	Performance Requirements	DS-7.1	IM-7	TC-7.1
NFR-2	Security Requirements	DS-8.1	IM-8	TC-8.1
NFR-3	Usability Requirements	DS-9.1	IM-9	TC-9.1

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.