MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF COMPUTING AND INFORMATICS

BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

OBJECT ORIENTEND ANLYSIS AND DESIGN (UML)

COURSE CODE: SWE2107

REQUIREMENTS ENGINEERING

COURSE CODE: SWE2102

GROUP 8

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Requirements Analysis for the Comfort Schools Inventory Management System

1. Project Overview

- **Project Purpose**: The **Comfort Schools Inventory Management System** aims to automate and enhance the process of managing uniform inventories in Ugandan schools. The goal is to replace the existing manual system, which is prone to delays, errors, and inefficiencies in tracking stock and generating reports.
- **Scope**:
  - The system will manage uniform stock (tracking, ordering, and issuing).
  - It will integrate with the school's financial system to record payments and generate financial reports.
  - The system will track stock records, manage orders, and provide accurate reporting of the store's status.
- **Stakeholders**:
  - **Primary Users**: Store Keeper (manages stock and orders).
  - **Secondary Users**: Financial system (monitors payments and generates financial reports), Administrators (use reports for decision-making).
  - **Beneficiaries**: Students and parents (through timely delivery and uniform availability).

2. Problem Statement

- Comfort Schools currently rely on manual methods for inventory management, leading to inefficiencies, inaccuracies, and delays. The CSIMS aims to address these issues by providing a centralized system for tracking stock levels, managing orders, generating reports, and integrating with the financial system.

3. System Goals and Objectives

3.1 Main Objective: To improve service delivery in Ugandan schools by developing a scalable and efficient inventory management system.

3.2 Specific Objectives:
- Streamline inventory processes to ensure timely receipt, storage, and issuance of items.
- Reduce financial losses due to overstocking or understocking.
- Integrate seamlessly with the school's financial system for easy monitoring.
- Enhance the accuracy and timeliness of stock reports.

4. Assumptions and Constraints

- **Assumptions**:
  - The school has an existing financial system that supports integration.
  - Storekeepers and financial personnel are trained to use the system.
  - The school has reliable internet connectivity for system access and data synchronization.
  - The system will be used primarily by storekeepers and administrators.
- **Constraints**:
  - The system must comply with the school's financial tracking and reporting rules.
  - The solution must be scalable to accommodate growing student numbers and stock data over time.

4. Functional Requirements

Storekeeper Functions:

- **FR-01**: The system must allow the storekeeper to track stock records (inventory of uniforms).
- **FR-02**: The system must allow the storekeeper to track orders placed for new uniforms.
- **FR-03**: The system must allow the storekeeper to issue stock (uniforms) to students.
- **FR-04**: The system must generate stock reports, including uniform availability and order status.
- **FR-05**: The system must allow storekeepers to record payments for uniforms sold.
- **FR-06**: The system must integrate with the financial system to generate financial reports based on stock activity and recorded payments.

Financial System Functions:

- **FR-07**: The system must generate financial reports based on uniform sales and payments received.
- **FR-08**: The system must ensure secure payment records for each transaction.

5. Non-Functional Requirements

- **Performance**: The system must handle up to 10,000 inventory transactions annually with no delays in generating reports.
- **Usability**: The interface should be user-friendly for storekeepers with basic computer knowledge.
- **Scalability**: The system should scale as more uniforms and students are added over the years.
- **Security**: All financial and stock data must be encrypted, and access to the system must be role-based (only authorized personnel should be able to modify inventory and financial data).

- **Reliability**: The system should have an uptime of 99.9% to ensure continuous tracking of uniform stock and payments.
- **Compliance**: The system must comply with school financial regulations.

6. User Requirements

The **Comfort Schools Inventory Management System** will serve different users, each with specific needs and interactions. The user requirements specify what each user type expects to accomplish with the system:

Store Keeper:

- **UR-01**: The storekeeper must be able to add new uniform stock to the system, specifying uniform type, size, and quantity.
- **UR-02**: The storekeeper should have the ability to track the number of uniforms available in the store at any given time.
- **UR-03**: The storekeeper must be able to issue stock to students and record these transactions in the system.
- **UR-04**: The system should allow the storekeeper to track uniform orders from suppliers and receive notifications of new stock deliveries.
- **UR-05**: The storekeeper should be able to generate stock reports, which include a summary of uniform availability and order statuses.
- **UR-06**: The storekeeper should be able to record payments made by students or parents for uniforms.
- **UR-07**: The system should enable the storekeeper to manage user roles and permissions within their interface.

Financial System/Department:

- **UR-08**: The financial system should automatically receive payment records from the storekeeper's transactions.
- **UR-09**: The system should generate financial reports for the bursar or accountant, summarizing payments made for uniforms and linking them to uniform stock sold.
- **UR-10**: The system should provide secure access to financial data for authorized financial personnel.

Administrators:

- **UR-11**: Administrators should be able to view stock reports generated by the storekeeper to help make strategic decisions (e.g., purchasing new uniforms, managing inventory levels).
- **UR-12**: Administrators should be able to track uniform order statuses and evaluate inventory performance over time.

7. Use Cases

Primary Actor: Store Keeper
Secondary Actor: Financial System

Use Case 1: Track Stock Records

- **Actor**: Store Keeper
- **Description**: The storekeeper updates the inventory records of uniforms based on stock levels, new orders, and issued uniforms to students.
- **Preconditions**: The stock must be added or updated in the system by the storekeeper.
- **Postconditions**: The system reflects accurate stock levels.

Use Case 2: Track Order

- **Actor**: Store Keeper
- **Description**: The storekeeper tracks incoming orders of uniforms from suppliers.
- **Preconditions**: Orders must be placed and accepted in the system.
- **Postconditions**: Order status is updated in the system.

Use Case 3: Issue Order (Extend Track Order)

- **Actor**: Store Keeper
- **Description**: Storekeeper issues uniforms to students based on incoming stock.
- **Preconditions**: Stock must be available in the system.
- **Postconditions**: Stock levels are updated accordingly.

Use Case 4: Generate Stock Reports

- **Actor**: Store Keeper
- **Description**: The system generates reports summarizing current stock levels and order statuses.
- **Preconditions**: The storekeeper must have updated stock information in the system.
- **Postconditions**: Reports are generated and can be exported or viewed by administrators.

Use Case 5: Record Payments

- **Actor**: Store Keeper
- **Description**: The storekeeper records payments received for uniforms.
- **Preconditions**: Payments must be made by students.
- **Postconditions**: Payments are reflected in the financial system.

Use Case 6: Generate Financial Report (Include Record Payments)

- **Actor**: Financial System
- **Description**: The financial system generates reports based on uniform sales and payments.
- **Preconditions**: Payment records must be available.
- **Postconditions**: Financial reports are available for bursary staff.

8. Data Requirements

- **Data Elements**:
  - Uniform stock data: Uniform size, type, stock levels, and order details.
  - Payment data: Payment ID, amount, date of payment.
  - Report data: Report ID, report type, report details.
- **Data Relationships**:
  - One storekeeper can manage multiple stock records and generate multiple reports.
  - Payment data is linked to the financial system and includes transaction details.

9. User Interface Requirements

- **Stock Management Interface**:
  - Storekeepers can view stock levels, enter new stock information, and track orders.
- **Reports Interface**:
  - Users can view or export stock and financial reports.

10. System Integration Requirements

- The system must integrate with the school's existing financial system to share payment data and generate merged financial reports.

11. Security and Privacy Requirements

- **Authentication**: Only authorized storekeepers can access stock records and manage uniforms.
- **Authorization**: Role-based access control for storekeepers, administrators, and financial personnel.
- **Data Privacy**: All personal and financial data must be securely stored and encrypted.

12. Risks and Mitigation

- **Risk**: Data loss due to system failure.
  - **Mitigation**: Regular backups and disaster recovery processes.
- **Risk**: Integration challenges with the financial system.
  - **Mitigation**: Use APIs and ensure compatibility through testing.

13. Testing Requirements

- **Unit Testing**: Test individual functions (stock management, payments, report generation).
- **Integration Testing**: Ensure seamless integration with the financial system.
- **User Acceptance Testing (UAT)**: Storekeepers and financial staff should test the system for usability and functionality before full deployment.

14. Acceptance Criteria

- All functional and non-functional requirements are met.
- The system is integrated with the financial system and can generate both stock and financial reports.
- Users can track stock, record payments, and manage uniforms efficiently.

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Administrators:

- **UR-11**: Administrators should be able to view stock reports generated by the storekeeper to help make strategic decisions (e.g., purchasing new uniforms, managing inventory levels).
- **UR-12**: Administrators should be able to track uniform order statuses and evaluate inventory performance over time.

16. Business Needs and Constraints

Business Needs:

- **BN-01**: The system must streamline the process of managing school uniform inventory to reduce time and errors associated with the manual system.
- **BN-02**: The system must integrate with the school's existing financial system to avoid duplicating payment and transaction records.
- **BN-03**: The system should allow the school to monitor stock levels in real-time, preventing uniform shortages and overstocking.
- **BN-04**: The system should improve financial tracking for uniform sales, ensuring that payments are accurately recorded and linked to issued stock.
- **BN-05**: The system should support reporting and analytics to allow administrators to make data-driven decisions.

Constraints:

- **C-01**: The system must comply with the school's financial regulations and ensure that all transactions are auditable.
- **C-02**: The system must work within the current IT infrastructure of the school, including its existing financial system.
- **C-03**: The system must handle sensitive financial data securely and follow applicable data protection policies (e.g., encryption of sensitive data).
- **C-04**: There may be a limited budget for system implementation, and it must be developed within these financial constraints.
- **C-05**: The solution must be delivered within a specific time frame, with no disruption to current operations.

17. Success Criteria

The success of the **Comfort Schools Inventory Management System** will be determined by the following measurable outcomes:

- **SC-01**: The system should reduce manual errors in stock management and order tracking by at least 80%.
- **SC-02**: Uniform stockouts should be minimized by maintaining accurate stock levels and automated tracking of orders and deliveries.
- **SC-03**: The time taken to generate stock and financial reports should be reduced by at least 70%.
- **SC-04**: The system should seamlessly integrate with the school's financial system, reducing duplicate data entries and ensuring that payment records are correctly reflected.
- **SC-05**: The system should provide user-friendly interfaces for both storekeepers and financial administrators, with a satisfaction rate of at least 90% in user feedback after deployment.
- **SC-06**: The system should ensure a 99.9% uptime for critical functionalities such as stock tracking and report generation.

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18. Prioritization (Ranked Requirements)

Given the business needs and constraints, the requirements will be prioritized based on their importance to system functionality and user satisfaction. Here's a ranking of the core requirements from **high** to **low priority**:

High Priority:

1. **FR-01**: Track stock records (inventory of uniforms).
2. **FR-03**: Issue stock to students and update stock levels.
3. **FR-06**: Integration with the financial system to generate financial reports based on stock activity.
4. **UR-02**: Track stock levels in real-time to avoid shortages.
5. **UR-06**: Record payments made by students for uniforms.
6. **UR-08**: Ensure the financial system automatically receives payment records.

Medium Priority :

1. **FR-04**: Generate stock reports (uniform availability and order status).
2. **FR-05**: Record payments for uniforms sold.
3. **UR-04**: Track uniform orders from suppliers.
4. **UR-11**: Provide administrators access to reports for decision-making.

Low Priority :

1. **UR-07**: Allow storekeepers to manage user roles and permissions.
2. **UR-10**: Provide secure access to financial data for authorized personnel.
3. **UR-12**: Allow administrators to track uniform order statuses over time.

4. **SC-05**: Achieve 90% satisfaction rate among users (storekeepers, financial personnel, administrators).

19. System Interfaces:

Interface	Description
User Interface (UI)	Provides input and control forms for storekeepers and administrators to manage stock and payments.
Database Interface	Interacts with the underlying relational database to manage stock, reports, and payments.
Financial System Interface	Integrates with the school's financial system to send and receive payment data.
Order and Supplier Interface	Future interface to track and manage orders directly from suppliers.
Reporting Interface	Generates and exports stock and financial reports for review and analysis.
Authentication Interface	Manages user roles, permissions, and secure login mechanisms.

20. A Requirements Traceability Matrix (RTM) helps to ensure that all requirements are addressed in the design, implementation, and testing phases.

Traceability Matrix:

Requirement ID	Description	Use Case/Diagram Reference	Class Diagram Reference	Test Case
UR-01	Add new uniform stock to the system	Track Stock Records	Stock, Storekeeper	Verify that the system allows the storekeeper to add stock.
UR-02	Track available uniform stock	Track Stock Records	Stock, Storekeeper	Verify that the stock levels are correctly tracked in the system.
UR-03	Issue stock to students and record transactions	Track Orders, Issue Order	Stock, Storekeeper	Verify stock issuance process updates stock levels correctly.

Requirement ID	Description	Use Case/Diagram Reference	Class Diagram Reference	Test Case
UR-04	Track uniform orders from suppliers	Track Orders	Storekeeper	Verify that uniform orders can be tracked from order to delivery.
UR-05	Generate stock reports	Generate Stock Reports, Manage Stock	Report, Storekeeper	Verify the system generates stock reports based on the inventory.
UR-06	Record payments for uniforms	Record Payments	Payment, Financial System	Verify that payments are recorded and reflected in financials.
UR-07	Manage user roles and permissions	N/A	N/A	Verify that the system allows the storekeeper to manage users.
UR-08	Automatically receive payment records in financial system	Record Payments, Generate Financial Report	Financial System	Verify that payment records are correctly received by finance.
UR-09	Generate financial reports for uniform transactions	Generate Financial Report	Financial System, Payment	Verify that financial reports accurately reflect stock activity.
UR-10	Provide secure access to financial data	N/A	N/A	Verify that financial data is accessible only to authorized users.
UR-11	View stock reports to aid decision making	Generate Stock Reports	Report	Verify that stock reports include all relevant inventory data.
UR-12	Track uniform order status and evaluate inventory performance	Track Orders, Generate Stock Reports	Stock, Report, Storekeeper	Verify the order tracking system shows the correct status.