Software Requirements Specification

(Inventory Management System)

Course Title: Software Engineering Lab (3112)

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1. Introduction

1.1 Project Name

Project on Inventory Management System (PIMS)

1.2 Purpose

The project purpose revolves around creating an inventory management system for the client and users of the business. The project details include stock information, managing stock, and ordering stock and reviewing the stock for the business operated in Shop(name). Currently they are using Microsoft Excel to store all the inventory details for the stock management and in future, will update to an interactive database. In the existing system, all the entries need to be entered manually and it's not reliable. It doesn't provide data security and data can be lost during any damage or system crash into the system. The new system will provide the reliability and security to the stored data and it also provides backup to the user. The allocated cost for the project is 12,000 USD and the time duration is three months.

1.3 Scope

The system that is currently used to manage stocks needs to be updated to an interactive system that will facilitate the Shop(name) to order stock, verify stock and request new stock. Creating an application for the inventory management for the business so that the respective user can order stock based on their needs which allow the user to put entries in to the database for better control over the stock and they can also have better control on verification and validation on the stock. The user can have easy access to request the stock according to their needs. The application will have the capability to allow user specific functionality based on their login. The user groups are spread across 4 types ranging from administrator, stock requester, stock controller and bistro staff. The functionalities are based on the user group. The designed application has the ability to cater to the specific user group.

1.4 Objectives

The objective of this project aims to develop an online application to store and maintain the stock information of the Ztech. The project is to create an application with a login ID at the front page to provide authorization for the staff of the business to manage the inventory control of the business. The new system will be very easy to use for the users and it will also allow ease to order, verify and request for the stock used in the Bistro. The new system provides a simple changeover from the current Database system to electronic Database system and it will be also easy to maintain.

1.5 Assumptions

The following assumptions will affect the progress of the project on inventory control systems:

- The new system will be available on the World Wide Web services.
- Inventory control is currently maintained on the Excel sheet and the information can be electrically transferred to the new system created.
- It is assumed that the client will be the only user for the system being developed.
- The time of the project is a maximum of three months and it should be completed by 11th Nov, 2024.
- The resources of the project will be acquired directly from the client and all the parties involved with the business.

2. Feasibility Study

2.1 Market/Demand Analysis

The global inventory management software market was valued at USD 2.13 billion in 2023. The market is projected to be worth USD 2.31 billion in 2024 and reach USD 4.84 billion by 2032, exhibiting a CAGR of 9.7% during the forecast period (2024-2032).[1] Inventory management software market growth is expected to be fueled by several factors, such as ease in integration with other business systems, such as accounting software or systems. During the pandemic, the need to manage companies inventories more efficiently, the rise in investments in inventory management systems proved to positively influence the market. Further, in the coming years, the growing demand for inventory management systems is also due to rising automation in warehouses for inventory control. This factor is driving the global market share. According to a survey by Zebra Technologies, 87% of industrial decision makers are in the process of or planning to expand their warehouses by 2024.[2]

2.2 Technical Feasibility:

Technical feasibility it is a study of hardware and software requirement that is echnical requirements of the system. In order to inform the management and the user about the requirement of technical resources.

The software will offer features such as:

- Product catalog management
- Real-time inventory tracking
- Order management
- Purchase order creation and tracking
- Reporting & analytics

2.3 Economic feasibility

Economic feasibility it is a study of cost benefit of the system. Actual cost of the system is calculated in the economical study to inform the management that this

much cost will be incurs to develop a new system. System cost is first part to be studied before starting system design. To know the total system cost is essential for any organization that is called cost benefit analysis. So the actual cost of the system is important before designing new system for how many years the system will prove beneficial to the organization is studied in economical feasibility study.The designed system will provide tangible as well as intangible benefit to theorganization. Tangible benefits are those, which can be in terms of money and intangible are those, which can't be measure in terms of money.[

The development cost of the software is estimated at 3000$ with ongoing [Annual Maintenance cost 500$. The costs associated with software development, implementation, training, and ongoing maintenance. Compare these costs against the potential benefits such

as increased efficiency, reduced errors, and improved decision-making. The return on investment over three years 5000$, considering factors like time saved, reduced inventory holding costs, and increased sales due to better inventory management.

3. Project Requirements

3.1 System Context Diagram

It is a diagram which is the highest level of data flow diagram. It shows the external environment of the developed system. This diagram contains only a single process that represents the whole system. Every other entity which is outside the system and diagrams related to each type are represented.

3.2 Procedure of functions

Administrator

- Admin, staff have their own login details like user id and password to access the application.
- Administrator logins into the system with username and password
- Administrator add/ remove the products from the system

- Administrator logout from the system.

Shop Staff

- Bistro Staff login with his username and password.
- Confirms the order with updated products.
- Prints the invoice for payment.

Logs out from the system.

3.3 Use case Scenario

Use case diagram is which describes the user interaction with the system. There are three main elements of a use case diagram such as actor, use case and relationship between them. A scenario is described as an instance which use case includes, and it is represented in only one path throughout the use case. It depends on reaction of the use case as user activities and also interaction of it with different related objects.

In this section the functions are designated using a use case diagram where the user interacts with the system.

The two actors involved in this system are:

- Admin
- Shop Staff

3.4 Use Cases:

1. Add New Product

Description: Add a new product to the inventory with details like name, SKU, description, price, and supplier.

Precondition: User is authenticated and authorized.

Postcondition: Product is added to the system.

2. Update Product Information

Description: Modify product details, such as price, description, or supplier.

Precondition: Product exists in the inventory.

Postcondition: Product information is updated in the system.

3. Adjust Inventory Levels

Description: Adjust stock quantities for a specific product due to various reasons, such as returns or manual corrections.

Precondition: Product exists in the inventory.

Postcondition: Inventory levels for the product are adjusted.

4. Generate Reports

Description: Generate various reports such as sales, inventory levels, and purchase history.

Precondition: User is authenticated.

Postcondition: Report is generated and available for viewing.

5. Place Purchase Order

Description: Create and send a purchase order to suppliers to replenish stock levels.

Precondition: Stock levels are below a defined threshold.

Postcondition: Purchase order is recorded and sent.

6. Fulfill Customer Order

Description: Process customer orders by reducing the inventory quantity and marking the order as fulfilled.

Precondition: Sufficient inventory exists.

Postcondition: Customer order is fulfilled, and inventory is updated.

7. Monitor Stock Levels

Description: Track inventory levels for each product and identify low stock items.

Precondition: User is authenticated.

Postcondition: Stock levels are monitored and available for review.

8. View Reports

Description: Access and view different reports generated by the system.

Precondition: Report generation has been completed.

Postcondition: Reports are displayed to the user.

9. Store Supplier Information

Description: Add or update supplier details, including name, contact information, and address.

Precondition: User is authenticated.

Postcondition: Supplier information is stored or updated in the system.

10. Add Staff

Description: Create a new staff account with permissions for inventory management tasks.

Precondition: User is an Admin.

Postcondition: New staff account is created.

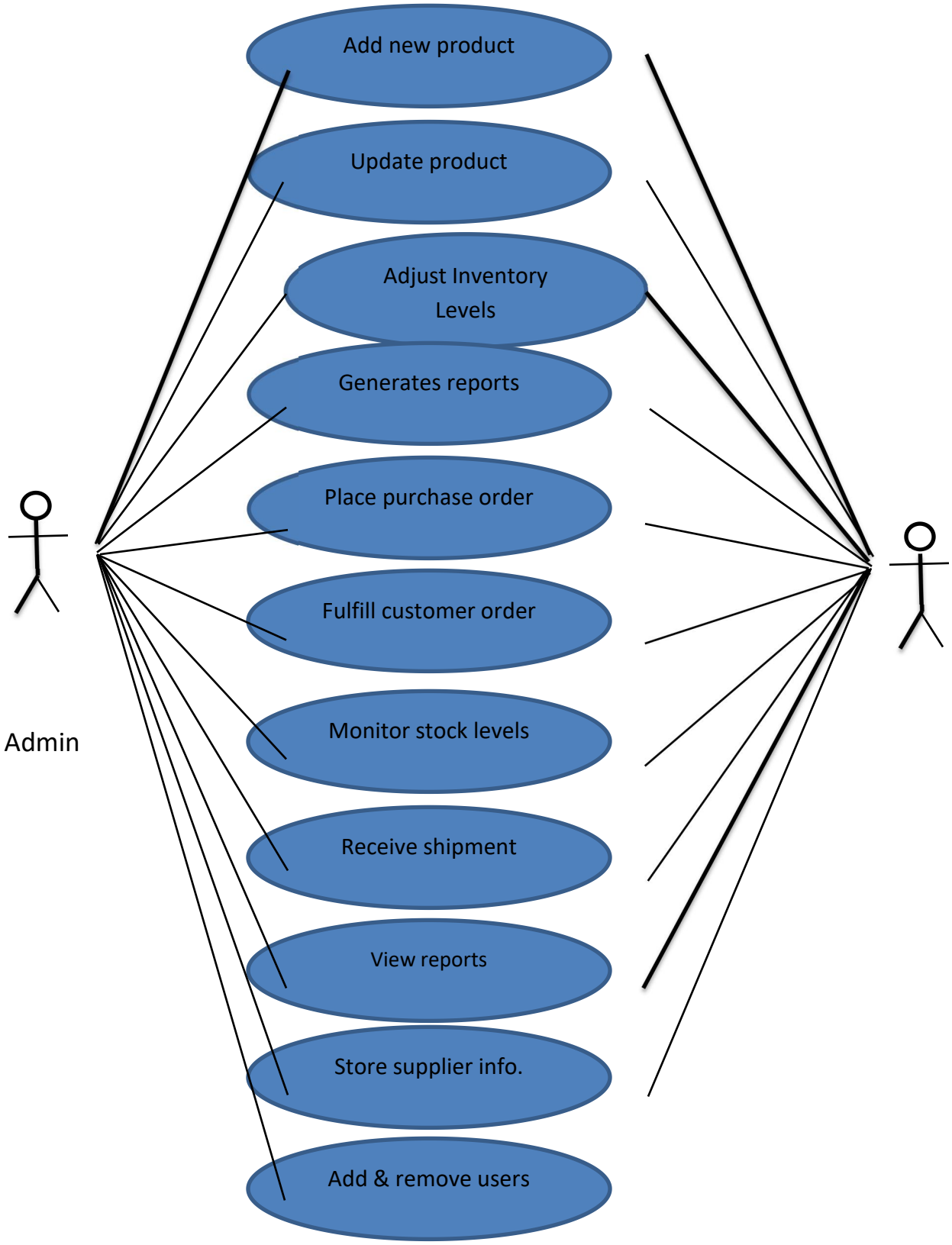
12. Remove Staff

Description: Delete an existing staff account.

Precondition: User is an Admin.

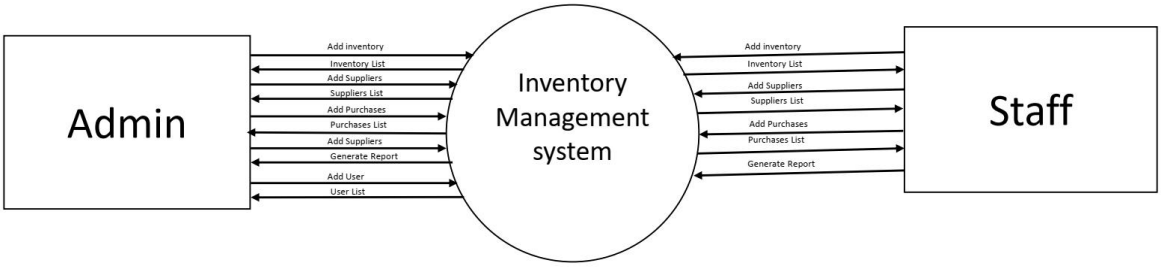
Postcondition: Staff account is removed from the system.

3.5 Use case diagram



4. Data Flow Diagram (DFD)

Data Flow Diagram is the graphical representation of flow of the data which are included in the process. It is the explosion of the context diagram. It includes nine processes in this diagram. Each process indicates a number while created. Data stores and other entities are also included in the data flow diagram. The following diagram shows how the data will be flown in activities that take place in the system:

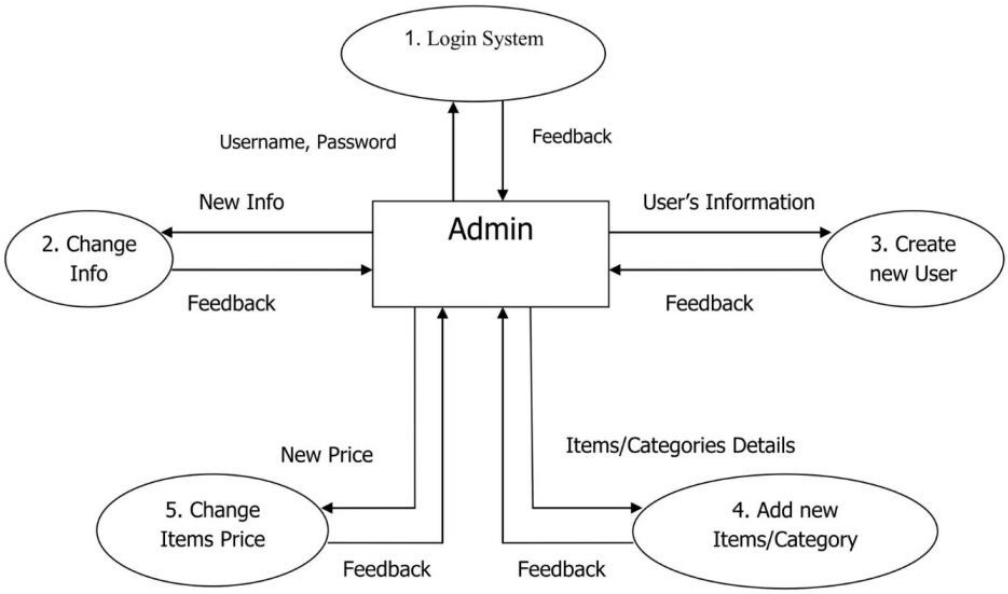


DFD Level 0 : Context Diagram

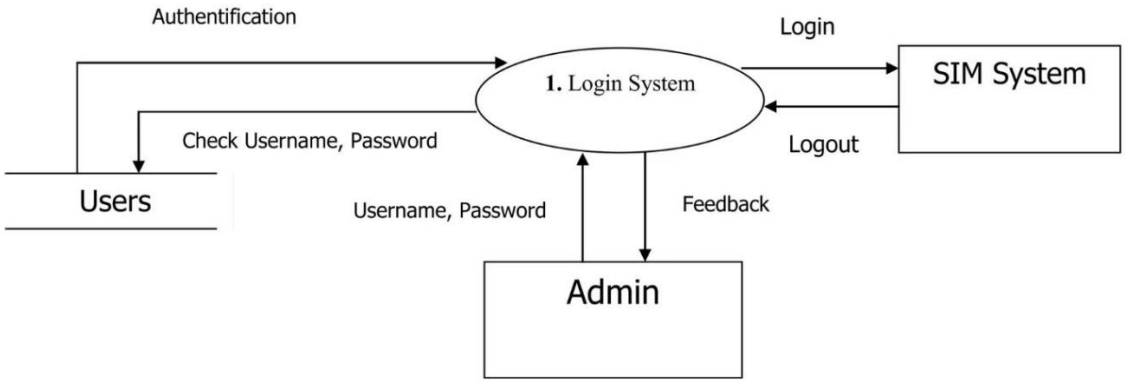
4.1 DFD Level 0: Context Diagram

This level provides an overview of the entire system, showing its interaction with external entities.

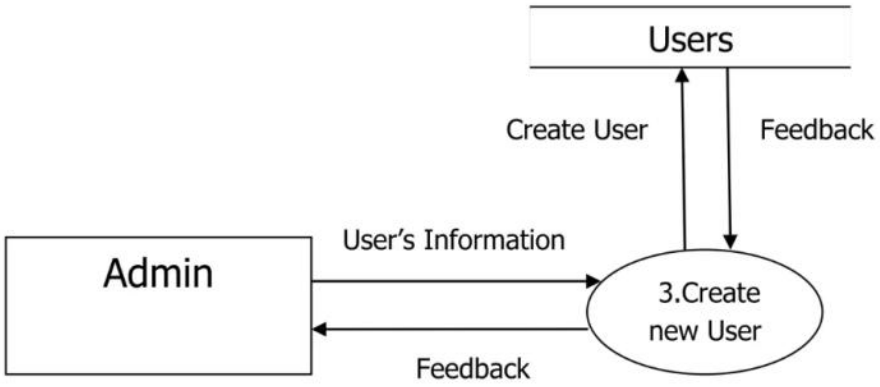
- **External Entities**:
  - **Admin**
  - **Staff (Clerk)**
  - **Inventory Database**
  - **Billing System**
- **Processes**:
  - **IMS System**: Central process that interacts with Admin, Staff, Inventory Database, and Billing System.
- **Data Flows**:
  - Admin and Staff interact with the IMS System to manage inventory and billing processes.
  - IMS System exchanges information with the Inventory Database for stock updates.
  - IMS System sends billing data to the Billing System for transaction records.



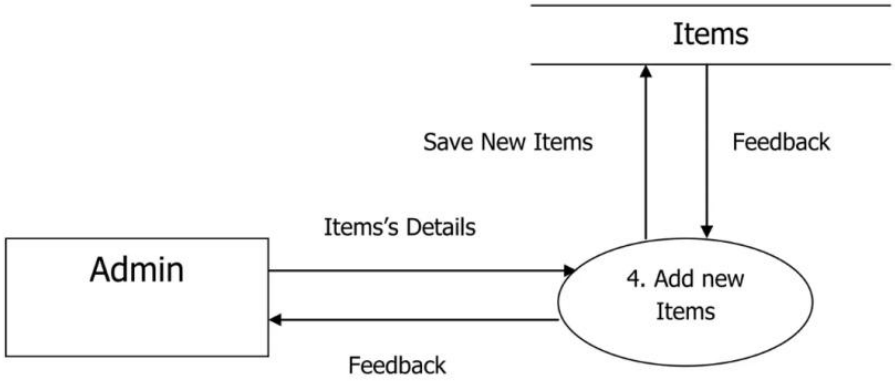
DFD Level 1.0 — Application Process : Admin



DFD Level 1.1 — Function Process : Login System



DFD Level 1.2 — Function Process : Create new User



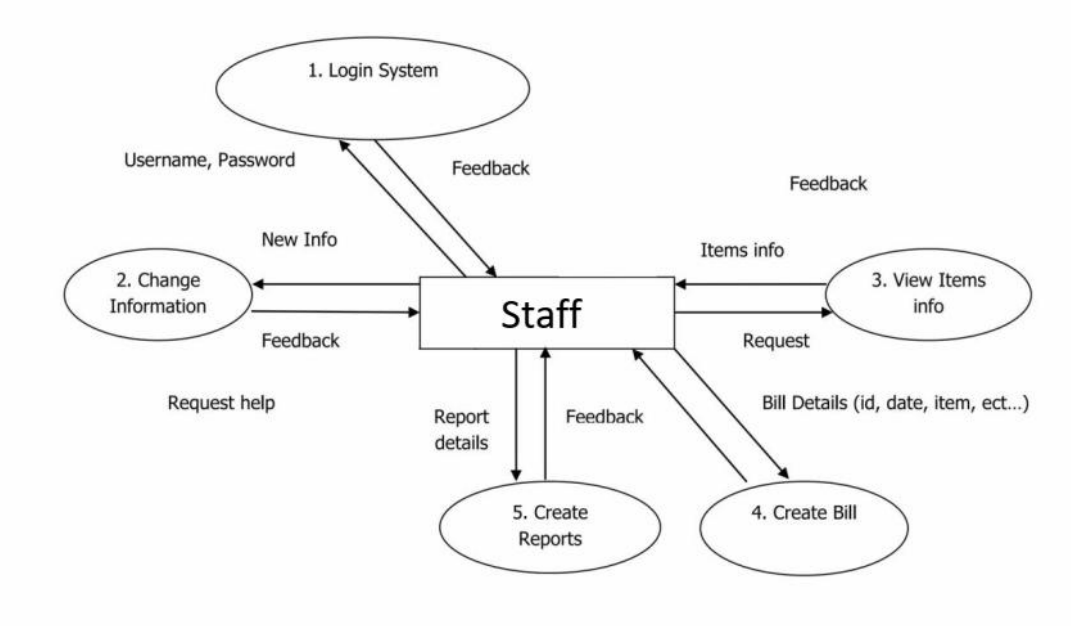
DFD Level 1.3 — Function Process : Add new Items

4.2 DFD Level 1.0: Application Process — Admin

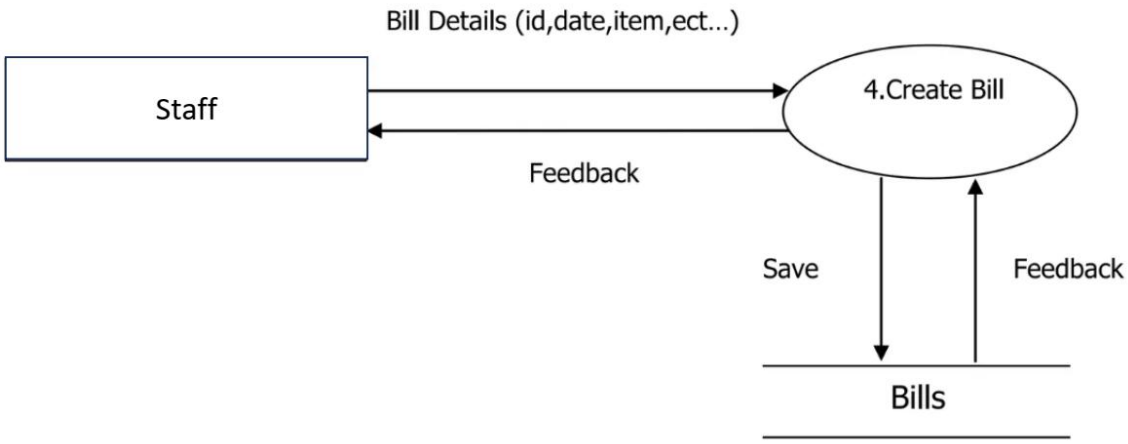
This level dives into the Admin processes within the IMS.

1. **Process 1.1: Login System**
    - **Description**: Admin logs into the system.
    - **Inputs**: Login credentials.
    - **Outputs**: Access granted or access denied.

2. **Process 1.2: Create New User**
    - **Description**: Admin creates a new user (Staff or Clerk) with defined permissions.
    - **Inputs**: User details (e.g., name, role, permissions).
    - **Outputs**: New user credentials generated.
3. **Process 1.3: Add New Items**
    - **Description**: Admin adds new inventory items to the system.
    - **Inputs**: Item details (e.g., name, quantity, category, price).
    - **Outputs**: Updated inventory database with new items.



DFD Level 1.0 — Application Process :Staff



DFD Level 1.1 — Function Process : Create Bill

4.3 DFD Level 1.0: Application Process — Staff (Clerk)

This level outlines the processes handled by the Staff (or Clerk) within the IMS.

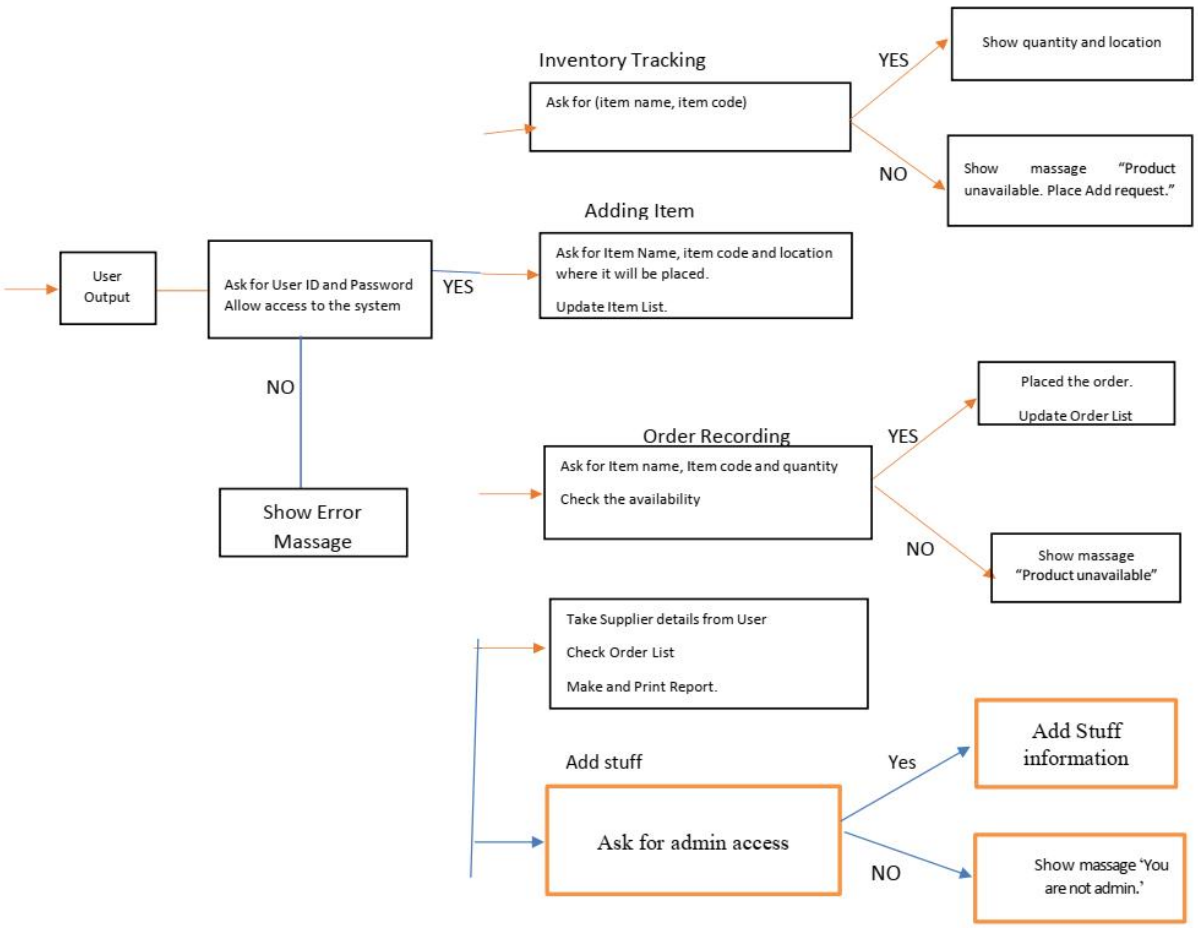
1. **Process 1.1: Create Bill**
    - **Description**: Staff generates bills for customer purchases.
    - **Inputs**: Customer details, item details, quantity purchased.
    - **Outputs**: Bill generated and inventory updated to reflect the sale.

Each DFD level provides a detailed breakdown of the processes in your IMS, illustrating how Admins and Staff interact with the system for inventory and billing functions. This setup will ensure effective monitoring and management of inventory and user roles.

5. Decision Tree and Decision Table

A **Decision Tree** and a **Decision Table** for an Inventory Management System (IMS) serve as tools to simplify and document decision-making processes.

5.1 Decision Tree:



5.2 Decision Table

Decision Table:

Login User	NO	YES	YES	YES	YES	YES	YES	YES	YES
Inventory Tracking	--	NO	YES	YES	NO	NO	NO	NO	NO
Adding Item	--	--	--	--	YES	NO	NO	NO	NO
Order Recording	--	--	--	--	--	NO	YES	YES	NO
Supply Item	--	--	--	--	--	--	--	--	YES
Product Available	--	--	--	--	--	--	NO	YES	--
Show Unavailable message	--	X	X	--	--	X	X	--	--
Show Quantity and Location	--	--	--	X	X	--	--	--	--
Place Order	--	--	--	--	--	--	--	X	--
Order List Available(Update)	--	--	--	--	--	--	--	X	X
Update Item list	--	--	--	--	X	--	--	X	X
Add stuff	--	X	--	--	--	--	--	--	--
Show Error Massage	X	--	--	--	--	--	--	--	--

6. Functional and Non-functional Requirements

The new system will have both the functional and non-functional requirements which are as follows:

6.1 Functional Requirements

Requirement No.	Requirement Name	Requirement Details	Priority
6.1.1	Authentication	The new system will provide the functionality that allows the client and manager of rundle bistro bar to login to the new system with their unique username and password. Then they will be guided to the next page based on their username.	Essential
6.1.2	Validation	If the client will enter the wrong username or password, then they cannot access or login to the new system.	Essential
6.1.3	Browse stock details	The new system will allow the client to browse all the available stock details after successful login into the system.	Essential
6.1.4	Update stock	This function allows manager and stakeholder update the details of the stock.	Essential
6.1.5	Request stock	This function allows user to request for the stock from the store to the Bistro.	Essential
6.1.6	Enter new item in inventory	This function allows user to enter or add the new item in the inventory.	Essential
6.1.7	Remove item	This function allows user to remove or delete the item from the stock.	Essential
6.1.8	Place an order	This function allows user to place an order for the required stock to the respective supplier.	Essential
6.1.9	Generate invoice	The new system will also have the functionality to generate the invoice to check the ordered stock.	Essential

6.2 Non-functional Requirements

Requirement No.	Requirement Name	Requirement Details	Priority
6.2.1	Usability	The new system will be simple and easy for the use to client.	Essential
6.2.2	Security	The new system will be secure from the unauthorized access.	Essential
6.2.3	Privacy	The new system will also provide safety to the user details and stock details.	Essential
6.2.4	User-Friendly	The new system will provide more interaction to the user so that user can easily interact with the new system.	Essential
6.2.5	Extensibility	The new system will have extensibility in future for the implementation of the new stock or items.	Negotiable

7. References

1. Administrator (2007). *Project Management Plan Template - Free Project Plan*. [online] Retrieved from: http://www.projectmanagementdocs.com/project-planning-templates/project-management-plan.html [Accessed: 18 Sep 2013].
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