USAID | DELIVER PROJECT

HEALTH COMMODITY MANAGEMENT INFORMATION SYSTEM (HCMIS)

DETAILED TECHNICAL DESIGN

FOR FACILITY EDITION

JUNE 2011

This publication was produced for review by the U.S. Agency for International Development. It was prepared by the USAID | DELIVER PROJECT, Task Order 1

HEALTH COMMODITY MANAGEMENT INFORMATION SYSTEM (HCMIS)

DETAILED TECHNICAL DESIGN

FOR FACILITY EDITION

USAID | DELIVER PROJECT, Task Order 1

The USAID | DELIVER PROJECT, Task Order 1, is funded by the U.S. Agency for International Development under contract no. GPO-I-01-06-00007-00, beginning September 29, 2006. Task Order 1 is implemented by John Snow, Inc., in collaboration with PATH; Crown Agents Consultancy, Inc.; Abt Associates; Fuel Logistics Group (Pty) Ltd.; UPS Supply Chain Solutions; The Manoff Group; and 3i Infotech. The project improves essential health commodity supply chains by strengthening logistics management information systems, streamlining distribution systems, identifying financial resources for procurement and supply chain operation, and enhancing forecasting and procurement planning. The project also encourages policymakers and donors to support logistics as a critical factor in the overall success of their health care mandates.

Recommended Citation

USAID | DELIVER PROJECT, Task Order 1. 2010. Health Commodity Management Information System (HCMIS) Detailed Technical Design for Facility Edition. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1

USAID | DELIVER PROJECT

John Snow, Inc.
1616 Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA
Phone: 703-528-7474
Fax: 703-528-7480
E-mail: askdeliver@jsi.com
Internet: deliver.jsi.com

CONTENTS

1 INTRODUCTION

Health Commodity Management Information System Facility Edition (HCMIS FE) is a facility management system developed by the USAID | DELIVER PROJECT for use in the Ethiopian Ministry of Health and the Pharmaceutical Fund & Supply Agency (PFSA) implemented to support the country's pharmaceutical logistics management system.

1.1 Purpose

The purpose of this document is to outline the technical design of the HCMIS FE and provide an overview for its implementation.

Furthermore, the document:

- Provides a link between the functional specification and detailed technical design documents
- Details the functionality which will be provided by each component or group components and shows how the various components interact in the design
- Provides a basis for the HCMIS FE detailed design and development

This document is not intended to address installation and configuration details of the actual implementation. Installation and configuration details can be found in the User Guides.

1.2 Approach

This document is created and extended in multiple phases over the course of the project. These phases include:

- *Requirements Phase* – During the requirements phase, the initial version of this document is created describing the candidate architecture to be validated in the System Design Phase
- *System Design Phase* – During this phase, the Evolutionary Prototype is created and this document is finalized by establishing a sound architectural foundation for the Implementation Phase
- *Implementation Phase* – During the Implementation Phase, this document is not expected to change radically; it is mainly updated to reflect changes in any interface definitions

- *Transition/Training Phase* – During the Transition/Training Phase, no further additions or modifications are made to this document

1.3 Document Organization

This document is divided into 12 chapters.

Chapter 1: *Introduction* - Deals with the Introduction with details on the purpose, approach, document organization and intended audiences

Chapter 2: *System Description* - Provides a detail system description about HCMIS FE

Chapter 3: *Screen Details* - Addresses the screen details about HCMIS FE

Chapter 4: *Data Model* - Outlines the data model for HCMIS FE

Chapter 5: *Program Logic* - States the program logic of HCMIS FE implementation

Chapter 6: *Input/output Requirements* - Describes the input/output requirements for HCMIS FE

Chapter 7: *Error Handling* – this chapter deals with the details of Error Handling

Chapter 8: *Installing Instructions* – In this chapter, installation steps will be stated

Chapter 9: *Operations Instructions* - Addresses the operations instructions about HCMIS FE

Chapter 10: *Assumptions* – Outlines the assumptions considered in implementing HCMIS FE

Chapter 11: *Additional Section* – includes definition and abbreviation used in this document

1.4 Intended Audience

The intended audiences for this document are HCMIS FE stakeholders, the project development team, IT analyst, database designers, and system testers.

2 SYSTEM DESCRIPTION

One of the major tasks in the facility stores is inventory control. HCMIS FE, therefore, is designed with the assumption that receiving and issuing of pharmaceutical supplies, managing the movement of items, and looking for specific item in the facilities are well dealt. Currently, the various transactions at facility levels are being dealt with bin and/or stock cards. The bin or stock cards are expended to manage the daily records of the transactions. The major transactions are comprised of receiving and issuing stock, updating the bin or stock cards and performing inventory counts.

To this end, the system shall be designed and developed in a way that universally accepted inventory standards are enforced. One of the significant issues to consider in the design of the system is the application (system) architecture as it plays a prominent role in assisting the design and deployment of the system. The architecture breaks up the application (based on functionalities and components) into layers (tiers).

Separating the components of the system into different layers provides a model to create a flexible and reusable application. Besides, modification and/or addition of functionalities to a specific layer can be best managed rather than rewriting the entire application all over again.

As most Windows-based systems, the HCMIS system will follow two-layer architecture; the application and data layers.

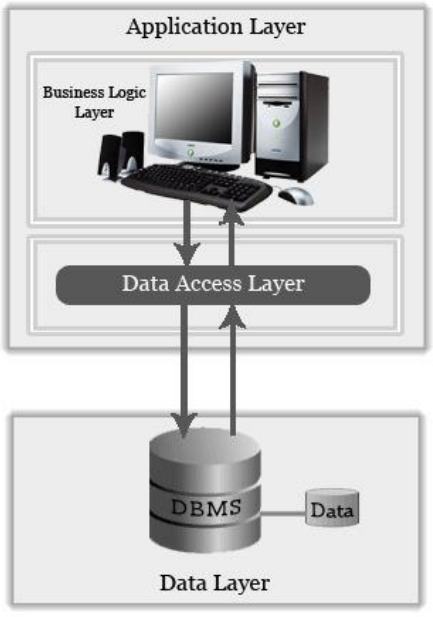

Figure 1: HCMIS FE System Architecture

3 SCREEN DETAILS

For a software system, the user interface plays a principal role in helping users visualize the system and provide them the options to interact with it. Taking this fact into account, due consideration is given to designing easy to use, friendly and highly integrated user interfaces for the HCMIS FE system. Besides, the user interfaces are designed in such a way that they can entertain future expansion and modification of the system.

3.1 User Interface Components

When HCMIS FE is launched, the login screen will be displayed prompting users to enter their user name and password. The system grants access if the credential of users is valid and currently active.

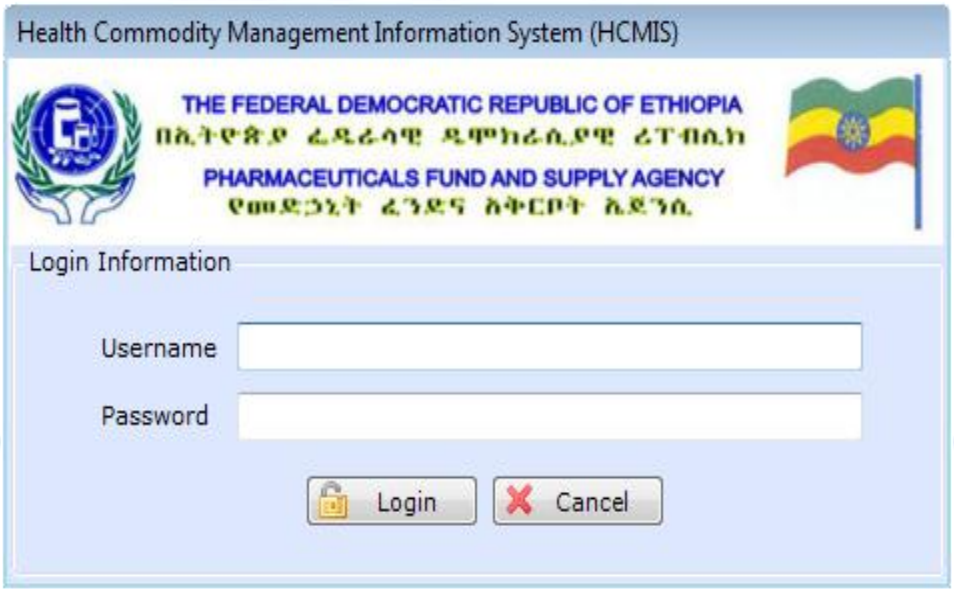

Figure 2: HCMIS FE login screen

Immediately after the user passes the security check, the main screen (window) of the system will be displayed. This screen contains different features for Facility Edition Figure 3 shows the main screen

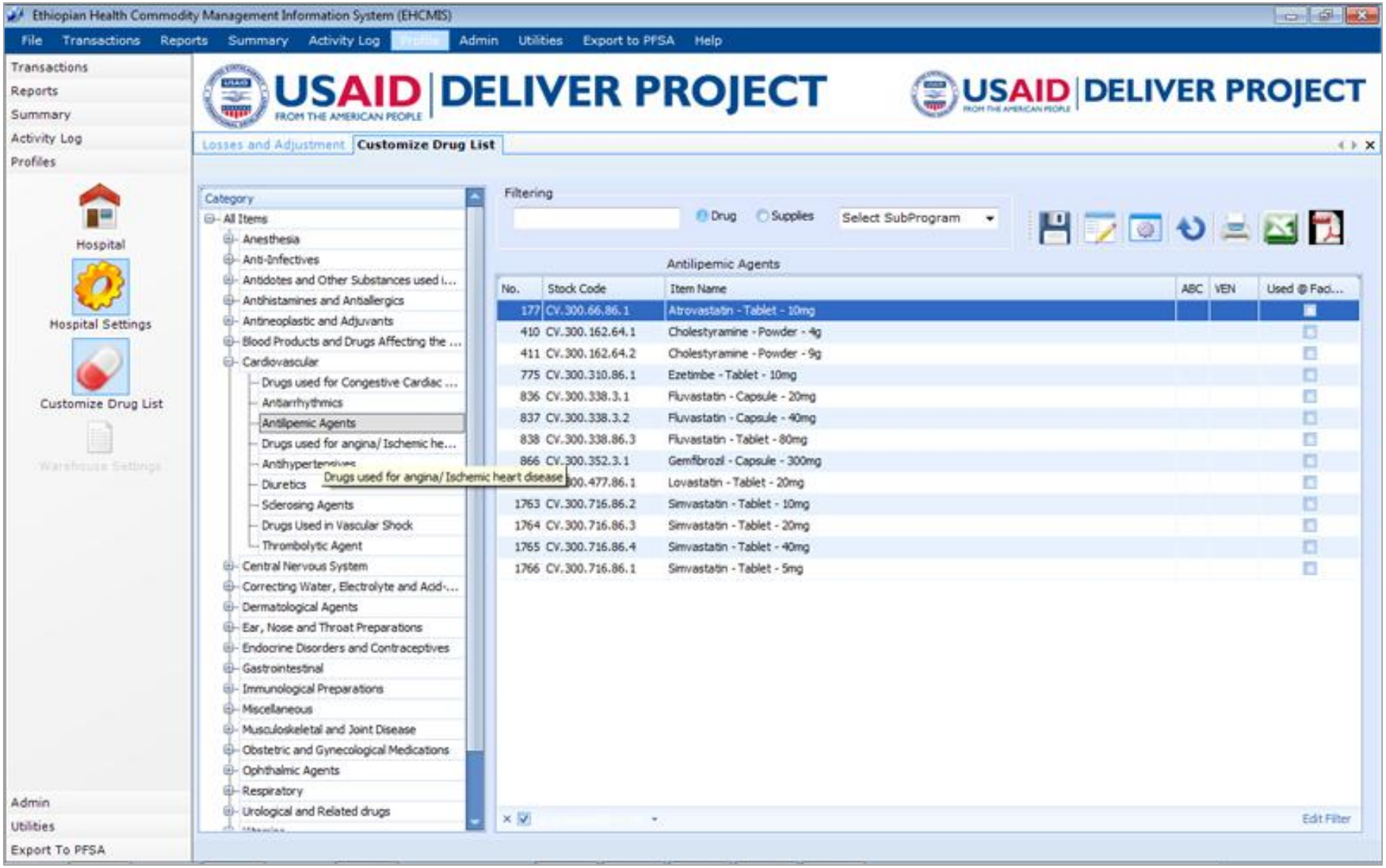

Figure 3: The main screen for HCMIS FE system

The HCMIS FE system contains features like handling transactions such as receives, issues, loss/adjustment, and inventory control are some of the features to properly manage information regarding the facilities. In addition, the facility edition provides reports such as the stock balance, and loss and adjustment.

Figure 4 to Figure 5 show some of the screen shots of these features.

Figure 4: HCMIS FE Loss and Adjustment screen

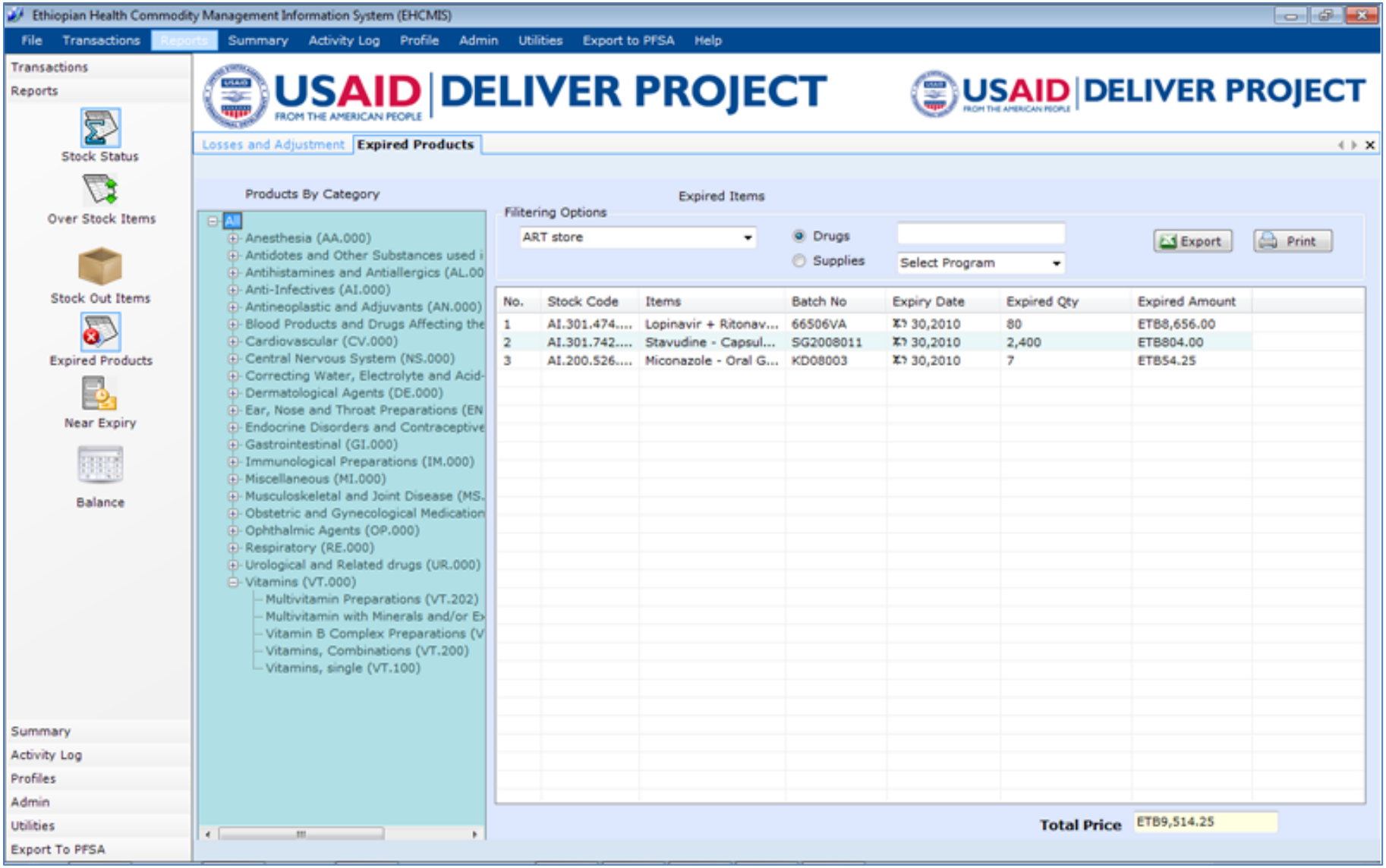

Figure 5: HCMIS FE Expired Product screen

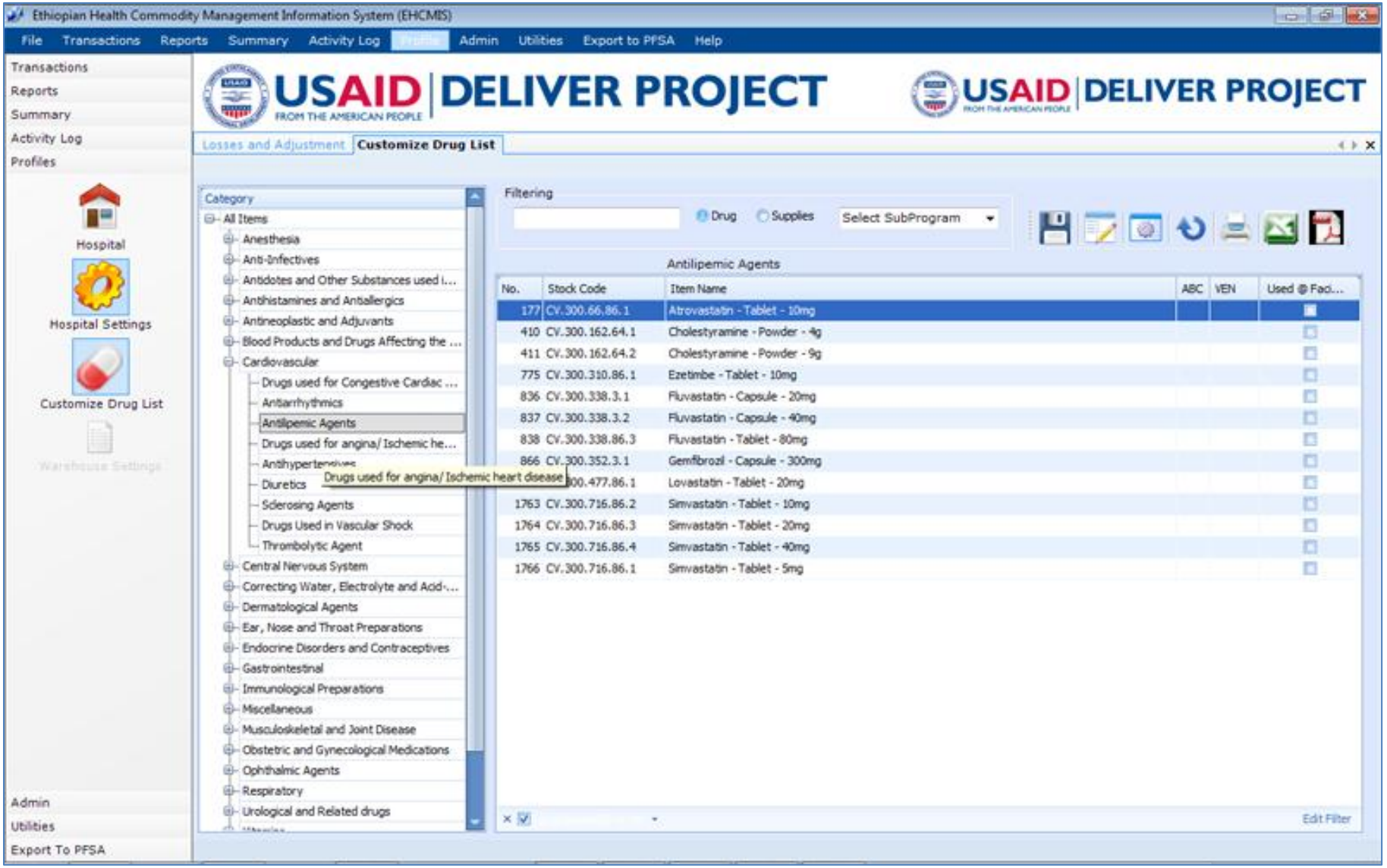

Figure 6: HCMIS FE Drug customization screen

4 DATA MODEL

Data Model is a method for describing data structures and a set of operations used to manipulate and validate that data. Data Model for the HCMIS FE System is as shown below

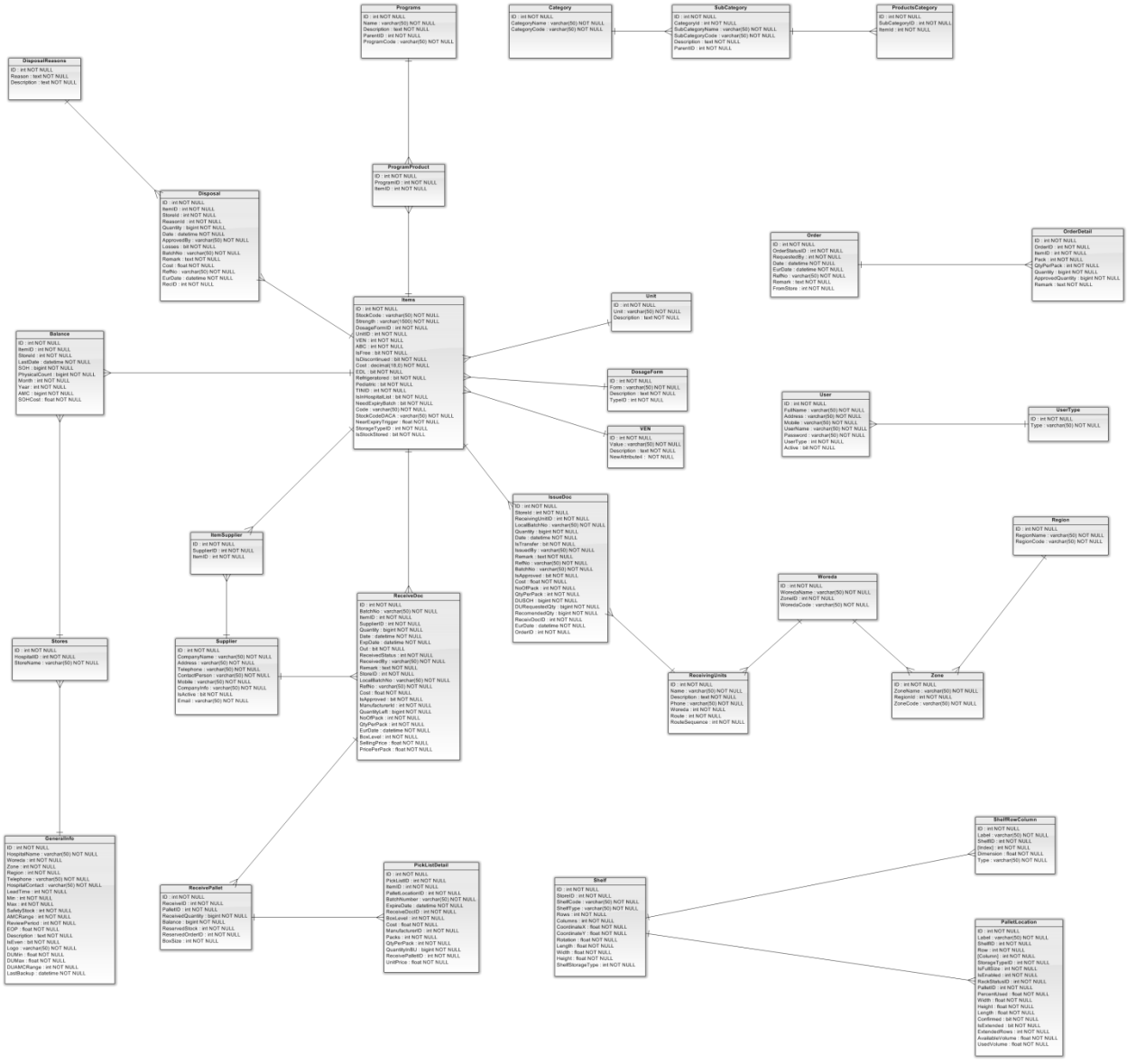

Figure 7 : Entity Relationship Diagram of the HCMIS FE System

5 PROGRAM LOGIC

This section of the document lists out administrative files used to help maintenance of the Facility versions of HCMIS FE System. The list includes tables to be updated, tables from which data is to be read and the purpose of the maintenance module. Besides, the list provides information regarding the version of the HCMIS FE System the module applies to.

Receive Item Module	
Update Table(s)	ReceiveDoc, ReceivePallet, Pallet, PalletLocation
Read-Only Table(s)	Item, Supplier, ItemPreferredLocation, ItemManufacturer
Purpose	This module is used to enter Item information into the system

Generating Pick List Module	
Update Table(s)	Order, PickList, PickListDetail, ReceivePallet
Read-Only Table(s)	Item, ReceiveDoc, ItemManufacturer, PalletLocation, Pallet, PickFace, Manufacturer
Purpose	This module is applied to generate the pick list of approved quantities to be issued

Confirm Picking/Issue Module	
Update Table(s)	Order, OrderDetail, Issue, PickList, PickListDetail, ReceiveDoc, ReceivePallet, PalletLocation
Read-Only Table(s)	Item, ItemManufacturer, Manufacturer
Purpose	This module is used to enter the actual values of items issued

Pick Face Replenishment Module	
Update Table(s)	PickFace, ReceivePallet
Read-Only Table(s)	ReceiveDoc, Item, PalletLocation, Store
Purpose	This module is used to replenish the pick face

Loss and Adjustment Module	
Update Table(s)	Disposal, ReceiveDoc
Read-Only Table(s)	Item, ReceiveDoc, IssueDoc
Purpose	This module is put in place to efficiently manage errors in data entry

Inventory Module	
Update Table(s)	ReceiveDoc, YearEnd
Read-Only Table(s)	ReceiveDoc, IssueDoc
Purpose	This module is applied to control inventory in the facilities and/or warehouses (hubs)

Stock Status Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Stock Status report

Over Stock Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Over Stock report

Stock Out Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Stock Out report

Issues By Receiving Unit Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Issues By the Receiving Unit report

Expire Products Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Expire Products report

Near Expiry Products Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is generates Near Expiry Products report

Summary Report Module	
Update Table(s)	None
Read-Only Table(s)	Category, Store, Item, ReceiveDoc, IssueDoc, Program, ReceivingUnit, Disposal, YearEnd, GeneralInfo
Purpose	This module is used to generate the Summary report

Activity Log Module	
Update Table(s)	ReceiveDoc, IssueDoc
Read-Only Table(s)	Item, IssueDoc, Store, ReceivingUnit, YearEnd
Purpose	This module is applied to manage receive, issue, loss and adjustment and inventory logs

Hub/Facility Setting Module	
Update Table(s)	GeneralInfo, Supplier, Store, Route, ReceivingUnit
Read-Only Table(s)	None
Purpose	This module is applied to manage the Hu/Facility settings

Customize Drug List Module	
Update Table(s)	Item, PreferredPalletLocation, PickFace, ItemManufacturer
Read-Only Table(s)	Category, Item, ItemManufacturer, Program, StorageType, ABC, VEN, PickFace, PreferredPalletLocation, Manufacturer
Purpose	This module is used to enter the prefer preferred location to put items in the facilities and/or warehouses (hubs)

6 INPUT/OUTPUT REQUIREMENTS

6.1 Input Requirements

Drug name list, Drug price, and employee information are the only required inputs for HMCIS FE to properly function.

6.2 Output Requirements

This section of the document describes the output requirements of the HCMIS FE. HCMIS FE is capable of generating a range of timely reports that are essential for sound and informed decision making. These reports are generated based on the data mainly gathered while maintaining transactions such as item receives, issues, loss/adjustment, and inventory.

The reports are:

- Stock Status Report
- Expired Product Report
- Near Expiry Product Report
- Balance Report
- RRF Report
- Summary Report
- Summary Chart
- Stock Expiry Status Report
- Cost Summary Report

7 ERROR HANDLING

The HCMIS FE shall have an automatic error handling mechanism which shall leave users informed about the exceptions thrown by the system. Appropriate error messages could help users rectify problems. Hence, to make the system integrated, due attention will be given to user-system interaction through communication messages.

8 INSTALLATION INSTRUCTIONS

As indicated in the previous sections of the document, the HCMIS FE offers an easy to use option for non-technical as well as IT personnel at the facilities. This section, therefore, discusses about the HCMIS FE installation procedures.

8.1 Objects

Object Name	Object Type	New/Modified
Items	Table	New
ItemSupplier	Table	New
IssueDoc	Table	New
VEN	Table	New
ABC	Table	New
Disposal	Table	New
DisposalReasons	Table	New
ReceiveDoc	Table	New
Spplier	Table	New
ReceivePallet	Table	New
DosageForm	Table	New
Balance	Table	New
Stores	Table	New
GeneralInfo	Table	New
ProgramProduct	Table	New
Programs	Table	New
Unit	Table	New
ReceivingUnits	Table	New
Woreda	Table	New
Zone	Table	New
Region	Table	New
Category	Table	New
ProductCategory	Table	New
SubCategory	Table	New
Users	Table	New
UserType	Table	New
Shelf	Table	New

8.2 Installation Steps

8.2.1 Prerequisite

The HCMIS FE requires a fully functional Windows environment with .NET Framework 4.0 and SQL Server Express edition installed.

8.2.2 Installing the HCMIS FE Software

1. Insert either the CD-ROM or the removable media (such as Flash Disk) containing the HCMIS FE software setup
2. From the root folder double click the setup.exe
3. Next, the setup will check for the installation prerequisites. If .NET framework is not installed, it will automatically start to install the .NET 4.0 framework setup
4. Just follow the simple installation wizard until the installation is completed
5. Next, it will detect the presence of the SQL Server Express edition installation. If the installation is not present, it will prompt the user to install it. Follow the instruction wizard until all dependencies are properly installed. Finally, it will install the software.
6. Once the installation is successfully completed, double click the HCMIS FE Icon from the desktop or from the program menu list. Then, enter the username and password on the login window and start to use the system

9 OPERATIONS INSTRUCTIONS

9.1 How to Start HCMIS FE

- Users can start the HCMIS FE system from the windows desktop or program menu

9.1.1 Starting HCMIS FE from the Windows Desktop

From the Window desktop, locate and double-click the HCMIS FE icon

9.1.2 Starting HCMIS FE from the Program Menu

1. Click on Start
2. Click on Program (All programs)
3. Locate and click on the HCMIS menu

9.2 Logging into the System

1. Enter your user name and password
2. Hit the Login button

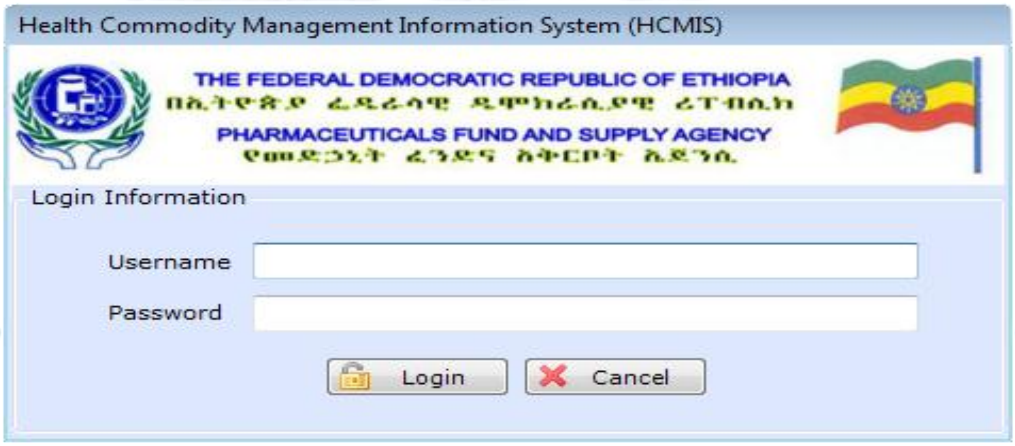

Figure 8: HCMIS FE login screen

Note: If you fail to log into the HCMIS FE

A. Make sure that you have provided the correct username and/or password
B. If the problem persists, please contact the system administrator

9.3 To logout

- Click the **File** menu and then select **Logout**

9.4 To exit HCMIS FE

- Click the **File** menu and then select Exit

10 ASSUMPTIONS

The HCMIS FE system is a graphical application software that requires users to have a computer with appropriate hardware and software components. Users are also required to have basic computer skills and familiarity with Graphical User Interfaces (GUI). Besides, the HCMIS FE system demands Microsoft .NET Framework 4.0 and Microsoft SQL Server later than 2005 to be properly installed and configured.

In addition to this, the HCMIS FE system is designed to be user friendly, reliable, error-free and secure. Therefore, it can be used by users with various backgrounds ranging from those with limited computing experience to advanced users and experts. Besides, the HCMIS FE system's code base shall be comprehensively commented, conventions explained, and ambiguities noted to ease the task of maintenance for future developers

11 ADDITIONAL SECTIONS

11.1 Definitions and Abbreviations

- HCMIS FE - Health Commodity Management Information System Facility Edition
- PFSA - Pharmaceutical Fund & Supply Agency
- GUI - Graphical User Interfaces
- RRF – Report and Resupply Voucher

USAID | DELIVER PROJECT
John Snow, Inc.
1616 Fort Myer Drive, 11th Floor
Arlington, VA22209USA
Phone: 703-528-7474
Fax: 703-528-7480
Email: deliver_project@jsi.com
Internet: deliver.jsi.com