

# Chapter 3 – Design

## 3.1 - Chapter Introduction

The design chapter discusses the proposed system's overall structure. This chapter describes the design processes, tools, and techniques used in the design phase, as well as the database of the system, as well as appropriate Use Case Diagrams, Entity Relationship Diagrams, and other UML Diagrams.

## 3.2 - Alternate Solution

Alternatives to the Web-Based Computer Hardware Purchasing and Troubleshooting Assistant management system include a mobile application, the use of a software collection, or the continued use of the current manual system.

### 3.2.1 - Stand-alone System

The stand-alone software is software that is not bundled with another piece of software and does not require an internet connection to run (work offline). It is not very useful for the Web-Based Computer Hardware Purchasing and Troubleshooting Assistant management system because outdoor service management cannot be carried out without the use of the internet, it is more expensive, and installation and maintenance are more difficult than with a Web-Based System.

### 3.2.2 - Collection of Software

The applications in the following list may be helpful in managing the Computer Hardware Purchasing and Troubleshooting Assistant management system.

- Appointment booking is a tool that assists in the scheduling of customer appointments.
- Inventory can manage individual objects as well as their corresponding categories, brands, and models.
- The warranty module facilitates the creation of warranty warnings. It displays the status of the goods' warranties as well as the remaining time on each item's warranty.

### 3.2.3 - Reason to Choose the Web-Based System

- The client's desire for a web-based system was unique.
- It's simple to keep track of the system's progress from any location.
- The system would be platform-independent.

- Because the database is centralized and everything is synchronized, maintenance is simple.
- Allow users to access the system at any time and from any location.
- It also allows for the usage of a wide range of devices to access the system.

### 3.3 - The Architectural Design of the System

As a Procedural Programming Design Concept, the system will be developed utilizing the Non-Object Oriented technique.

In a procedural language, a program is a list of statements, each of which instructs the computer to perform a certain task. It concentrates on the technique (function) and algorithm that are required to complete the derived computation. When a program grows in size, it is divided into functions, each with a distinct purpose. One of the fundamentals of structured programming is the division of the program into functions and modules.

Procedural oriented programming has several characteristics.

- The emphasis is on getting things done (Functions).
- The program is divided into many functions.
- Passing parameters across functions allows them to communicate with one another.
- Global variables are shared between functions.
- The procedure calls are based on the notion.
- When it comes to program design, it takes a top-down approach.

### 3.4 - Use Case Diagram for the Proposed System

The following is a high-level Use Case Diagram for the Proposed System.

The system's actors:

Admin: Create users and manage user permissions in the system.

Shop Manager: Manage all the orders made by the customers.

Inventory Manager: Manage the inventory of the store.

Delivery Manager: Manage all deliveries and register new courier companies

Technician: Respond to the customer's appointments and follow the job card.

Customer: Make orders and make appointments.

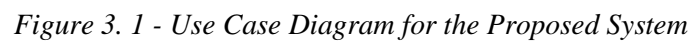


Figure 3. 1 - Use Case Diagram for the Proposed System

### 3.5 - Use Case Narratives for the Proposed System

#### 3.5.1 - Use Case Narratives for Login Module

Use-case Number	UC-04	
Use-Case Name	Login	
Priority	High	
Actor	Admin, Shop Manager, Inventory Manager, Delivery Manager, Technician, Customer	
Description	This use case describes how Shop Staff and Customers are logins to the System.	
Precondition	All actors are properly registered to the system.	
Post-condition	If the use case was successful, the actor is now logged into the system. If not, the system state is unchanged.	
Basic course of Action	<b>User Action</b>	<b>System Response</b>
	1. The Actor is on the login page to log in to the system. 3. The Actor enters username and password, click on a Login Button.	2. The system promotes the Actor to enter the Username and Password. 4. The system verifies that all the filled have been filled out and valid. 5. The system successfully logged in the system. 6. Use case Exit
Alternate course of Action	4.1 If all fields are not filled out and not matched to the username and password the system notifies the actor a message “Invalid Username or Password” and then goes back or returns to step 3 of the basic course of Action to enter again.	

*Table 3.1 - Use Case Narrative for Login Module*

### 3.5.2 - Use Case Narratives for Insert Inventory Item

Use-case Number	UC-08	
Use-Case Name	Insert Inventory Item	
Priority	High	
Actor	Inventory Manager	
Description	This use case describes how to manage items in inventory	
Precondition	None	
Post-condition	If the use case was successful, the actor can add the product to the system and set it to sell to the customers.	
Basic course of Action	<b>User Action</b>	<b>System Response</b>
	1. Actor clicks the “Add Item” in the Item Management section. 3. Actor fill the fields (Item Image, Item Name, Category, Brand, Model, SKU number, Insert variable specifications, reorder level, Unit price, and Sale price) 4. Actor click “Insert Item”	2. System prompts the form to insert details to the actor. 5. System validates the Item Name and SKU already in the system. 6. System display message “New Item Insert”
Alternate course of Action	5.1. If an item is already inserted into the system display the popup message “This Item Already in the System”.	

*Table 3.2 - Use Case Narrative for Login Module*

The high-level ER Diagram below depicts the relationships between the proposed system's constituents. (Figure 3.2)

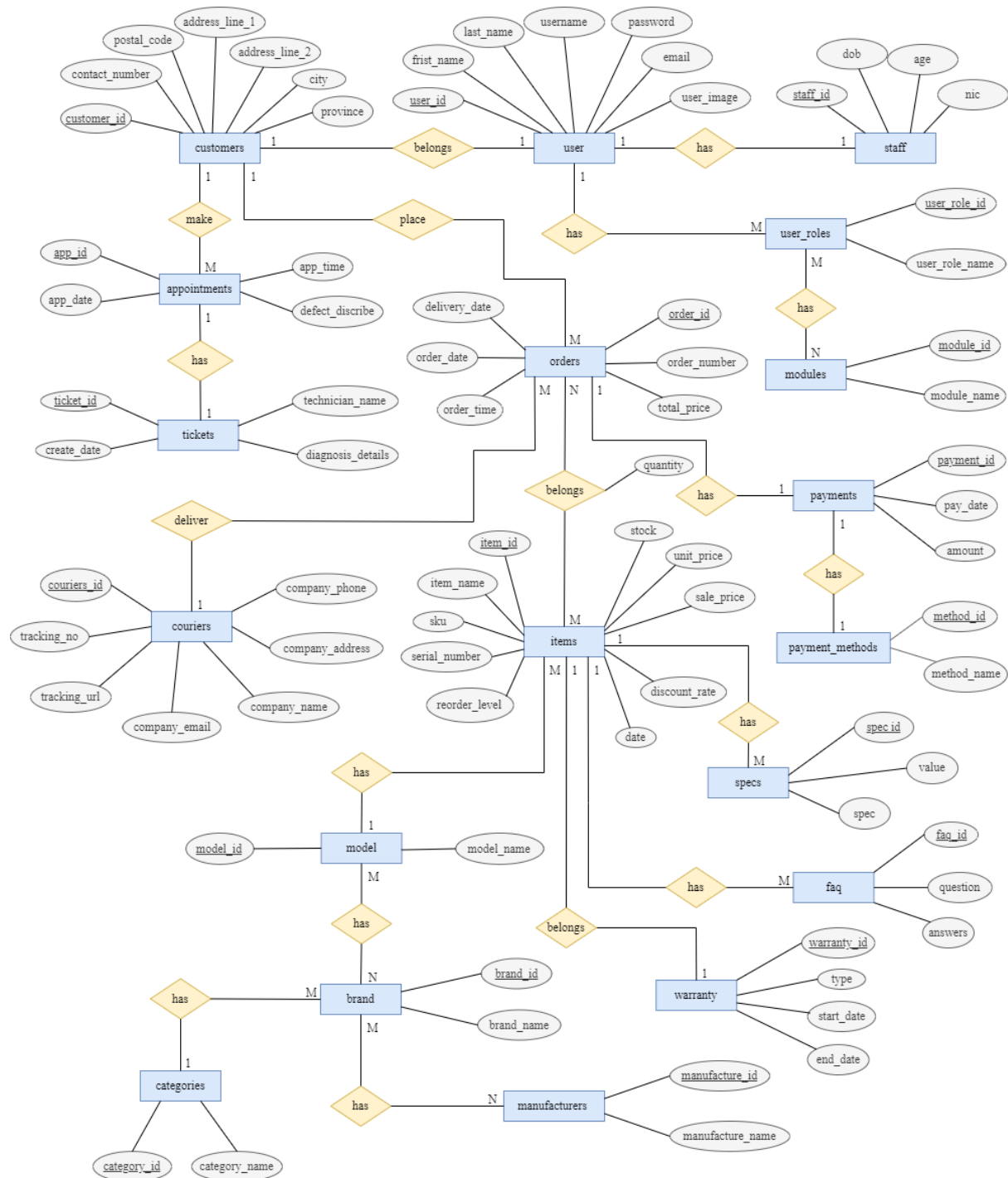
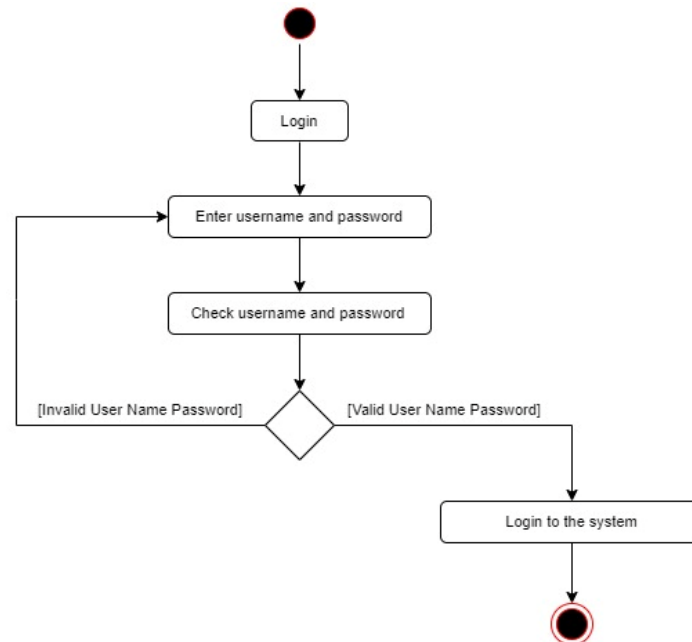


Figure 3. 2 – ER Diagram for Proposed System

## 3.7 - Activity Diagrams for the Proposed System

### 3.7.1 – Activity Diagram for Login

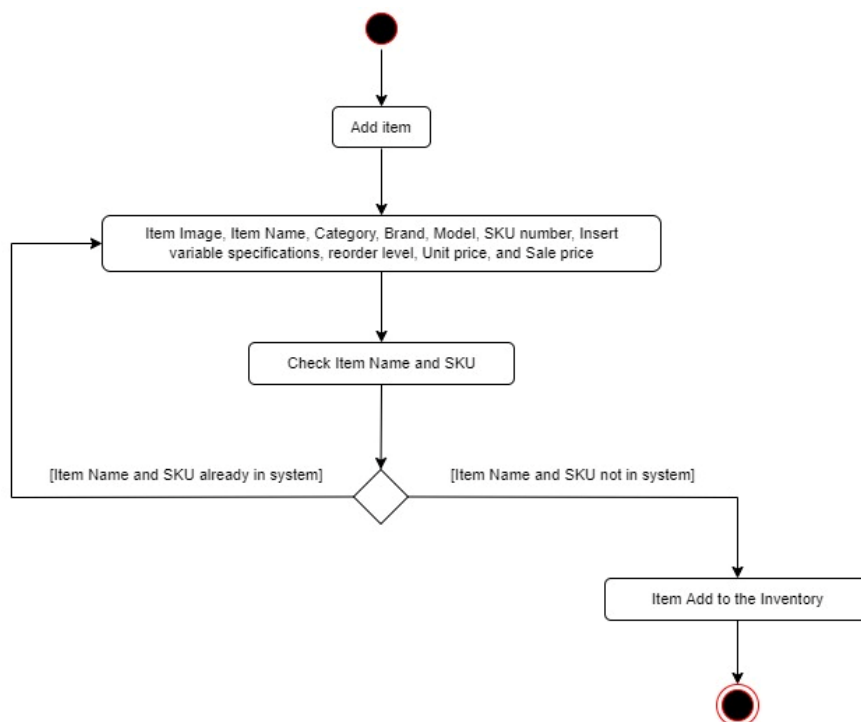
The activity diagram for creating workouts is shown in Figure 3.3.



*Figure 3. 3 – Activity Diagram for Login*

### 3.7.1 – Activity Diagram for Add Item

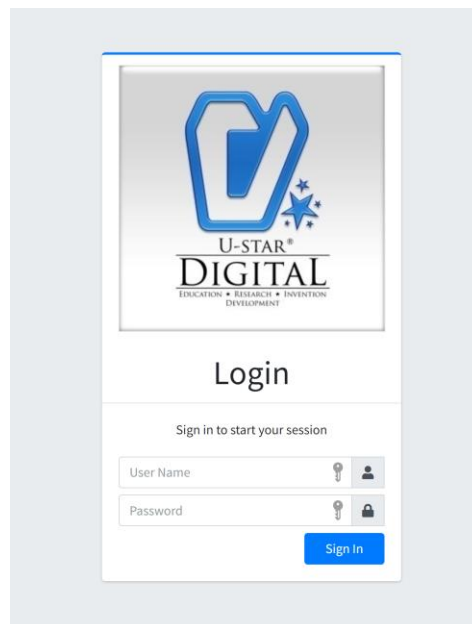
The activity diagram for add new item to inventory is shown in Figure 3.3.



*Figure 3. 3 – Activity Diagram for Add Item*

## 3.9 – UI Designs for the Proposed System

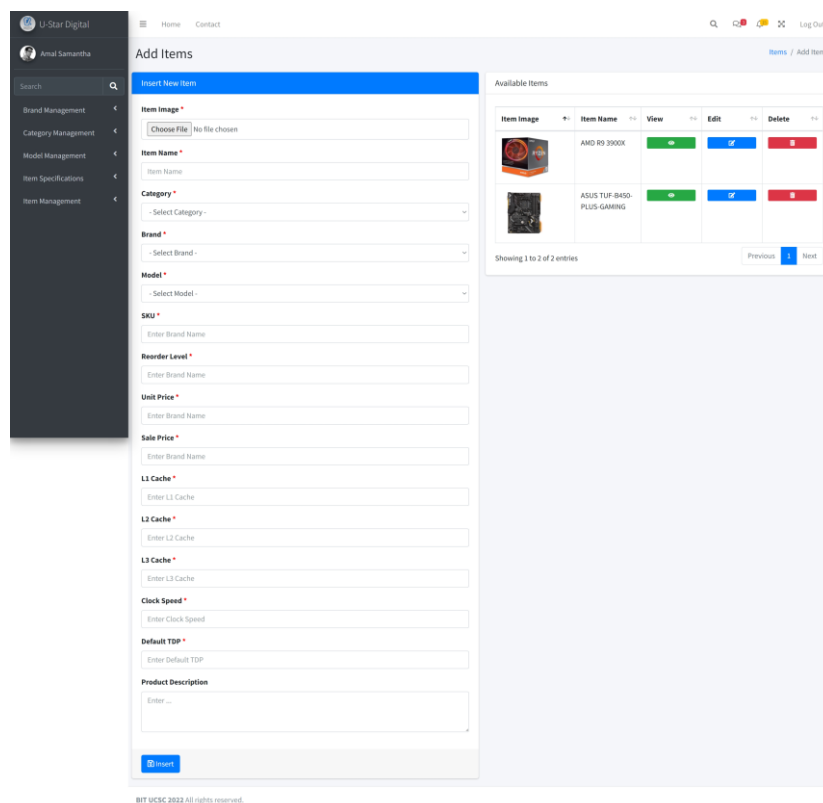
### 3.9.1 – Login Page UI Design



The login form is centered on a light gray background. It features the U-STAR Digital logo at the top, which includes a stylized blue 'U' and 'S' with a star, and the text 'U-STAR® DIGITAL' with 'EDUCATION • RESEARCH • INVENTION • DEVELOPMENT' below it. Below the logo is the word 'Login' in a large, bold, black font. Underneath is the text 'Sign in to start your session'. The form contains two input fields: 'User Name' and 'Password', each with a key icon to its right. A blue 'Sign In' button is positioned at the bottom right of the form.

Figure 3. 5 – Login Form UI Design

### 3.9.2 – Add Item Page UI Design



The 'Add Items' page is a complex form with a dark sidebar on the left containing navigation links: 'Brand Management', 'Category Management', 'Model Management', 'Item Specifications', and 'Item Management'. The main content area is titled 'Add Items' and includes a 'Choose File' button for 'Item Image'. Below this are several input fields for 'Item Name', 'Category', 'Brand', 'Model', 'SKU', 'Reorder Level', 'Unit Price', 'Sale Price', 'L3 Cache', 'Clock Speed', 'Default TDP', and 'Product Description'. A blue 'Insert' button is at the bottom left. On the right, an 'Available Items' table lists two items: 'AMD R9 3900X' and 'ASUS TUF-B450-PLUS GAMING'. The table has columns for 'Item Image', 'Item Name', 'View', 'Edit', and 'Delete'. The bottom of the page includes a footer: 'BIT UCSC 2022 All rights reserved.'

Figure 3. 5 – Add Item UI Design



### 3.9.3 – Item Page View UI Design

U-Star Digital

Amal Samantha

Brand Management
Category Management
Model Management
Item Specifications
Item Management

Home
Contact

Log Out

ASUS TUF-B450-PLUS-GAMING
Items / View Items

#### Product Description

AMD B450 ATX gaming motherboard with Aura Sync RGB LED lighting, DDR4 4400MHz support, 32Gbps M.2, HDMI 2.0b, Type C and native USB 3.1 Gen 2. Fan Xpert 4 Core: Ensures every fan achieves the best balance of cooling performance and acoustics TUF Protection: SafeSlot, ESD Guards, DDR4 overvoltage protection, Digi+ VRM, and stainless-steel back I/O for long-term reliability Military-grade TUF Components: TUF LANGuard, TUF Chokes, TUF Capacitors, and TUF MOSFETs for maximum durability Exclusive DTS® Custom audio: Delivers positional cues to stereo headphones, helping you to pinpoint enemies and action Aura Sync RGB: Synchronize LED lighting with a vast portfolio of compatible PC gear

Unit Price - Rs: 28500  
Sale Price - Rs: 25500  
Discount Rate - 11 %  
SKU: 265959595TUF450  
Reorder Level: 10  
In Stock:

Item Features	Details
Brand	AMD
Product Family	AMD Ryzen™ Processors
Product Line	AMD Ryzen™ 9 Desktop Processors
CPU Cores	12
CPU Threads	24
Max Boost Clock	Up to 4.6GHz
Base Clock	3.8GHz
Total L1 Cache	768KB
Total L2 Cache	6MB
Total L3 Cache	64MB
Default TDP	105W
CMOS	TSMC 7nm FinFET
Unlock for Overclocking	Yes
CPU Socket	AM4

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Figure 3. 6 – Individual Item View UI Design