

ACCOUNTING APP

**JAVA DEVELOPER COURSE
GRADUATION PROJECT**



3.13.2021

1. Introduction

1.1 Scenario

- “Company X” needs a web based application to manage accounting tasks such as:
 - Sales,
 - Purchase,
 - Stock management,
 - Administrative operations.
- A Software Development Company “Friday.Com” provides such capabilities with a web-based accounting application with yearly subscriptions.
- When Company X pays for this yearly subscription, an ADMIN username and password is provided, with the provided credentials ADMIN of Company X is able to create MANAGER and EMPLOYEE users and Company X can keep the track of accounting processes. Company Y, Z and many others might follow the same track for their needs as well.
- **Task:** You are a software developer working for “Friday.Com”.
 - Design a web-based Accounting App for companies like “Company X” with capabilities defined in the following slides.

1.2 Purpose of Document

This is a Requirements Specification document for a new web-based accounting system for Cybertek School Graduation Project. In the market there is a need a ng web-based accounting system.

The accounting application will operate below main capabilities

- create products by category and set quantity purchase and sale prices
- create invoices by their purpose it may be purchase invoice or sale invoice
- generate stock-based reports
- create users with ADMIN, MANAGER, EMPLOYEE roles
- aforementioned processes will be managed under separate companies
- Root user will create companies and ADMIN user for the company
- This will be a Software as a Service (SAAS).

1.3 Project Scope

The scope of this project is a web-based system that supports the accounting operations of SMC. The web site will support major accounting operations like sales, purchase and stock management as well as administrative operations.

1.4 System Purpose

1.4.1 Users

Those who will primarily benefit from the new system and those who will be affected by the new system include

ROOT:

Upon implementation of the accounting system, root user can create companies and ADMIN type user for the company and bound the association.

ADMIN:

The admin user has two main functionalities, create MANAGER or EMPLOYEE type user and download the log file.

MANAGER:

Manager has several capabilities to operate the web site to achieve accounting processes

- CRUD of product with providing its attributes, PFA (Accounting_ER diagram)
- CRUD of product categories with providing its attributes
- CRUD of 3rd. party Vendor/Customer companies with providing its attributes
- CRUD and Approval for Invoices
- Generate monthly stock and profit-loss report

EMPLOYEE:

- CRUD of Invoices
- Display Stock report

1.4.2 Responsibilities

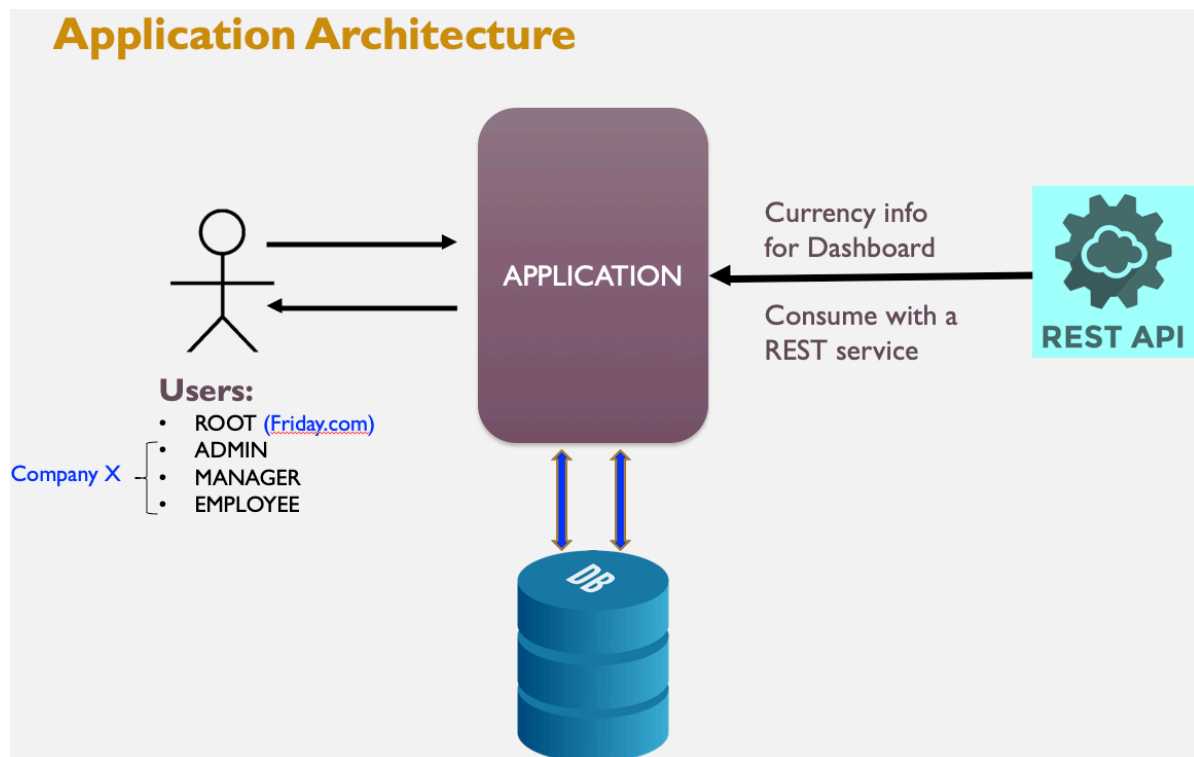
The primary responsibilities of the new system:

- Provide users directly create invoices and manage stocks
- There are two types of invoice;
 - Sell: Sales Invoice
 - Purchase: Purchase Invoice
- Invoice – stock relation will be handled automatically. eg. If there purchase invoice has been completed stock qty should be increased automatically
 - Product base price will be considered static and it represents sales base price
- For each product tax will be stored.

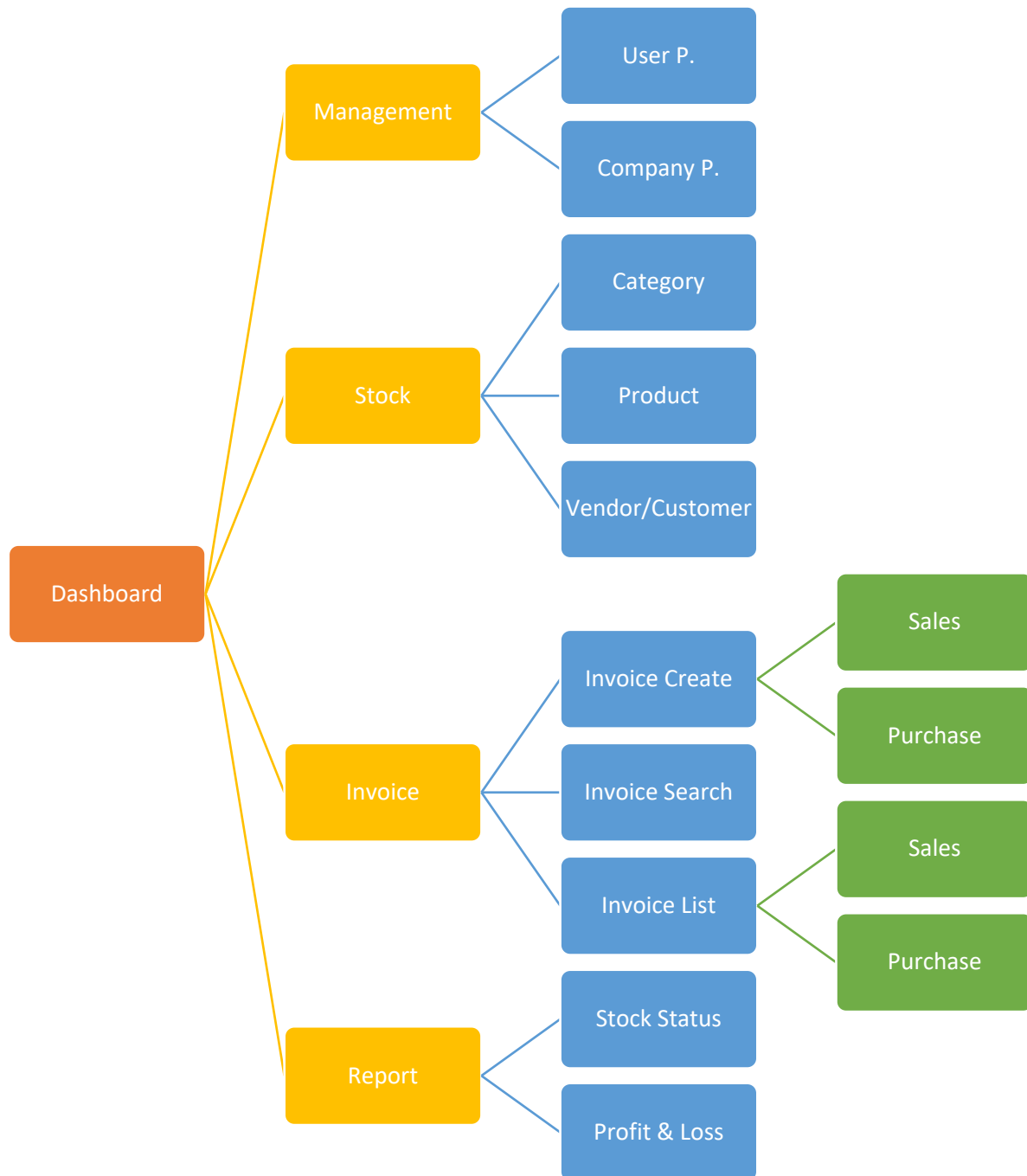
- Total profit or loss should be calculated excluding tax but product purchase-sell
 - “unitPrice” of “InvoiceProduct” table will be considered sale base price, if invoice type is Sales Invoice
 - “unitPrice” of “InvoiceProduct” table will be considered purchase base price if invoice type is Purchase Invoice
 - System should calculate profit & loss using above sales prices
 - FIFO approach should be used
- There will be one main screen (dashboard) where all users except Root User should land in.
- Main dashboard should have below statistics by company
 - total selling invoice count by current year
 - purchasing invoice count by current year
 - currency information. API detail will be provided. 3rd party API will be consumed via WebClient
- Menu should be populated by user credentials.
- Each service should you logged using Log4j2 and daily base log file must be rolled

2. System Architecture & Business Logic

2.1 Architecture Overview



2.2 Menu Design Tree

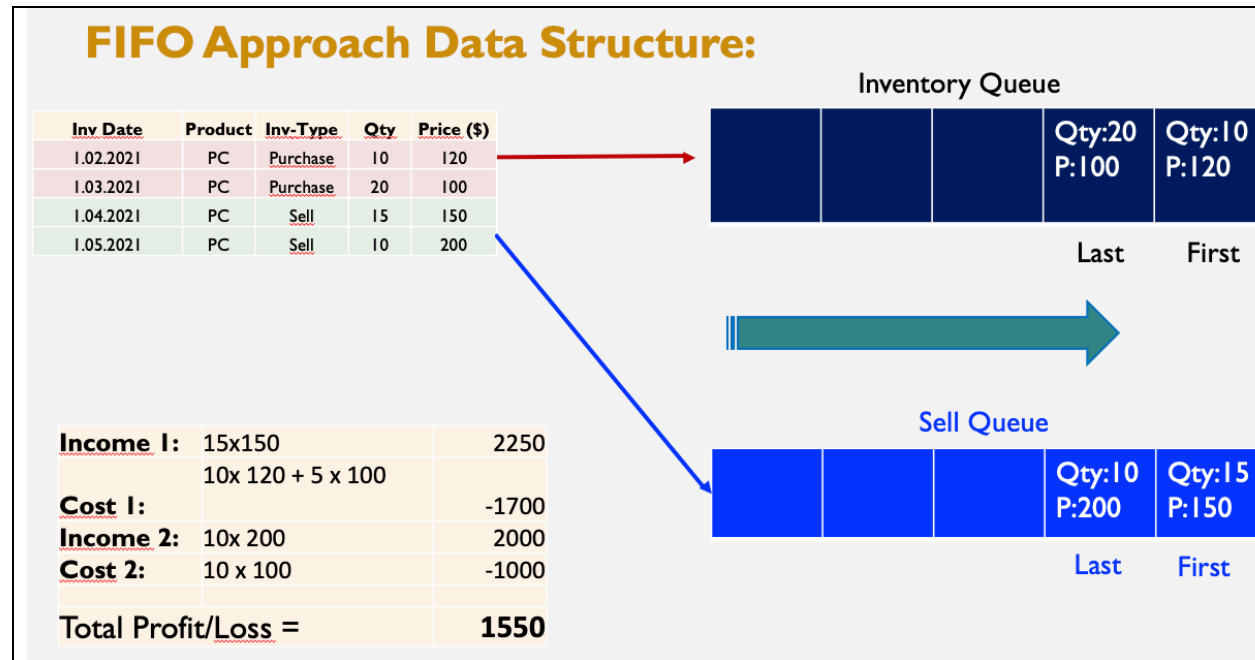


2.3 Profit / Loss Calculation

- Total profit or loss should be calculated excluding tax
 - “unitPrice” of “InvoiceProduct” table will be considered sale/purchase base price for all invoice types.
- Calculation will be made on the fly without keeping the calculated values on the database.
- System should calculate profit & loss using above sales prices
 - FIFO approach should be used to calculate P&L.

	Inv Date	Product	Inv-Type	Qty	Price (\$)
	1.02.2021	PC	Purchase	10	120
	1.03.2021	PC	Purchase	20	100
Income 1	1.04.2021	PC	Sell	15	150
Income 2	1.05.2021	PC	Sell	10	200
Total Profit/Loss= Income - Cost					
	income 1:	15 x 150		2250	
	cost 1:	10 x 120 + 5 x 100		-1700	
	income 2:	10 x 200		2000	
	cost 2:	10 x 100		-1000	
	Total Profit/Loss =			1550	

Example Data Structure for Profit/Loss Calculation:



3. The Use Case Model

3.1. Use Case Descriptions (for selected cases)

Notes:

- For all use cases, the user can cancel the use case at any step that requires user input. This action ends the use case. Any data collected during that use case is lost.
- For all use cases that require a logged in user, the current login session is updated during the use case to reflect the navigation paths through the use case.

Login User

Use Case Name:	Login User
Summary:	In order to get personalized or restricted information, place orders or do other specialized transactions a user must login so that that the system can determine his access level.
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates that he wants to login.2. The system requests the username and password.3. The user enters his username and password.4. The system verifies the username and password against all registered users.5. The system starts a login session and displays a welcome message based on the user's preferences.
Alternative Flows:	<p>Step 4: if username is invalid, the use case goes back to step 2.</p> <p>Step 4: if the password is invalid the system requests that the user re-enter the password. When the user enters another password the use case continues with step 4 using the original username and new password.</p>
Extension Points:	None
Preconditions:	The user is registered.
Postconditions:	The user can now obtain data and perform functions according to his registered access level.
Business Rules:	Some data and functions are restricted to certain types of users or users with a particular access level.

Register User (ROOT, ADMIN)

Use Case Name:	Register User
Summary:	In order to get personalized or restricted information, place invoice or do other specialized operations a new user must register a username and password.
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates that he wants to register.2. The system requests a username and password.3. The user enters a username and password.4. The system checks that the username does not duplicate any existing registered usernames.5. The system requests a firstname, lastname, email, password, company and access level.6. The user enters the information.7. The system determines the user's access level and stores all user information.8. The system executes use case <i>Dashboard Population</i>.9. The system starts a login session and displays a welcome message based on the user's preferences.
Alternative Flows:	<ul style="list-style-type: none">• Step 4: If the username duplicates an existing username the system displays a message and the use case goes back to step 2.• Step 5: If the user does not enter a required field, a message is displayed and the use case repeats step 4.
Extension Points:	<i>Dashboard Population</i>
Preconditions:	none
Postconditions:	The user can now obtain data and perform functions according to his registered access level.

Register Company (ROOT)

Use Case Name:	Register Company
Summary:	In order to place invoice , sell/purchase product, register user and generate reports new company must be registered with proper information
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates that he wants to register company.2. The system requests a company title.3. The system requests a company address4. The system requests a state, zip and representative5. The system requests a company email6. The system requests a company establishment date7. The system checks that the company title does not duplicate any existing registered company.8. The user enters the information.9. The system executes use case <i>Register User</i>.10. The system starts a login session and displays a welcome message based on the user's preferences.
Alternative Flows:	<ul style="list-style-type: none">• Step 4: If the company title duplicates an existing company the system displays a message and the use case goes back to step 2.• Step 5: If the user does not enter a required field, a message is displayed and the use case repeats step 2.
Extension Points:	<i>Register User</i>
Preconditions:	none
Postconditions:	The user can now use accounting application properly

Dashboard Population (ADMIN, MANAGER, EMPLOYEE)

Use Case Name:	Dashboard Population
Summary:	This use case allows a registered user to land in main page and see annual statistics, stock condition and currency exchange information.
Basic Flow:	<ol style="list-style-type: none">1. The use case start when a user logs in the web application2. The system displays all invoices per year by count on the left side of the page3. The system displays stock condition per product<ol style="list-style-type: none">1. Some restriction might be applied if qty less than 5 row can be colored with red or else green4. The system displays current exchange rates in euro, yen, rupi
Alternative Flows:	None
Extension Points:	None
Preconditions:	The user is logged in.

Place Purchase Invoice (MANAGER, EMPLOYEE)

Use Case Name:	Place Purchase Invoice Scenario: User places invoice.
Summary:	This use case allows a registered user to place an invoice for a vendor or customer.
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to place an invoice for the current vendor or customers with existing products2. The system displays the products information: name3. The system requests the quantity to order.4. The system requests the price per product5. The system allows add/remove multiple product item per invoice6. The user may add or change any of the information.7. The system stores the invoice information, decreases the quantity on hand for the product.8. The system displays a order completion message and sends a receipt to the user.
Alternative Flows:	
Extension Points:	<i>Purchase Invoice List</i>
Preconditions:	The customer is logged in and has requested to create purchase invoice
Postconditions:	The product is bought.

Place Purchase Invoice (MANAGER, EMPLOYEE)

Use Case Name:	Place Purchase List Scenario: User displays purchase invoice list.
Summary:	This use case allows a registered user to display a purchase invoices for active year
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to display a purchase invoice2. The system displays the purchase invoices with the information below;<ol style="list-style-type: none">a. invoice no,b. vendor name,c. total price,d. invoice datee. the user who created purchase invoice3. The system displays an invoice within the table format sorted by date.
Extension Points:	<i>none</i>
Preconditions:	The customer is logged in and has requested to display purchase invoice list
Postconditions:	The purchase invoices have been listed

Place Sales Invoice (MANAGER, EMPLOYEE)

Use Case Name:	Place Sales Invoice Scenario: User places invoice.
Summary:	This use case allows a registered user to place an invoice for a customer.
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to place an invoice for the current customers with existing products2. The system displays the products information: name3. The system requests the quantity to sell.4. The system requests the price per product5. The system allows add/remove multiple product item per invoice6. The user may add or change any of the information.7. The system stores the invoice information, decreases the quantity on hand for the product.8. The system displays a order completion message
Alternative Flows:	
Extension Points:	<i>Sales Invoice List</i>
Preconditions:	The customer is logged in and has requested to create sales invoice
Postconditions:	The product is sold.
	Step 8: If the quantity on hand is not sufficient for this order, a message is sent to the user the use case is canceled.

Sales Invoice List (MANAGER, EMPLOYEE)

Use Case Name:	Place Sales List Scenario: User displays sales invoice list.
Summary:	This use case allows a registered user to display a sales invoices for active year
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to display a purchase invoice2. The system displays the purchase invoices with the information below;<ol style="list-style-type: none">a. invoice no,b. customer name,c. total price,d. invoice datee. the user who created purchase invoice3. The system displays an invoice within the table format sorted by date.
Extension Points:	<i>none</i>
Preconditions:	The customer is logged in and has requested to display sales invoice list
Postconditions:	The purchase invoices have been listed

Register Product Category (MANAGER)

Use Case Name:	Place Product Category Scenario: User registers a product category for a company
Summary:	This use case allows a registered user to place new product category
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to register a product category2. The system requests below information to create new category;<ol style="list-style-type: none">a. Category name3. The system completes the registration and displays success message.
Alternative Flows:	<p>Step 4: If the category name duplicates an existing category name for the company the system displays a message and the use case goes back to step</p> <p>Step 5: If the user does not enter a required field, a message is displayed and the use case repeats step 2.</p>
Extension Points:	none
Preconditions:	The customer is logged in and has requested to place product category
Postconditions:	The product category has been created

Register Product (MANAGER)

Use Case Name:	Place Product Scenario: User registers a product for a company
Summary:	This use case allows a registered user to place new product category
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to register a product2. The system requests below information to create new product;<ol style="list-style-type: none">a. nameb. descriptionc. quantityd. price3. The system displays the registered product categories4. The system displays the product sale units: LB, PC etc5. The system completes the registration and displays success message.
Alternative Flows:	<p>Step 6: If the name duplicates an existing product name for the company the system displays a message and the use case goes back to step 2</p> <p>Step 7: If the user does not enter a required field, a message is displayed and the use case repeats step 2.</p> <p>Step 8: If the purchase invoice registered, quantity will be increased automatically</p> <p>Step 9: If the sales invoice registered, quantity will be decreased automatically,</p>
Extension Points:	none
Preconditions:	The user is logged in and has requested to place product
Postconditions:	The product category has been created

Register Vendor/Customer (MANAGER)

Use Case Name:	Place New 3r party companies Scenario: User registers a vendor or customer companies
Summary:	This use case allows a registered user to place new 3 rd party companies to fulfill sales or purchase invoices
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to register a new 3rd party company2. The system requests below information to create new 3rd party companies;<ol style="list-style-type: none">a. Company nameb. phonec. email3. The system displays the 3rd party company types: Vendor, Customer4. The system completes the registration and displays success message.
Alternative Flows:	<p>Step 6: If the name duplicates an existing company name for the 3rd party company the system displays a message and the use case goes back to step 2</p> <p>Step 7: If the user does not enter a required field, a message is displayed and the use case repeats step 2.</p>
Extension Points:	none
Preconditions:	The user is logged in and has requested to place a vendor or customer
Postconditions:	The 3 rd party company has been created

Display Stock Status (MANAGER, EMPLOYEE)

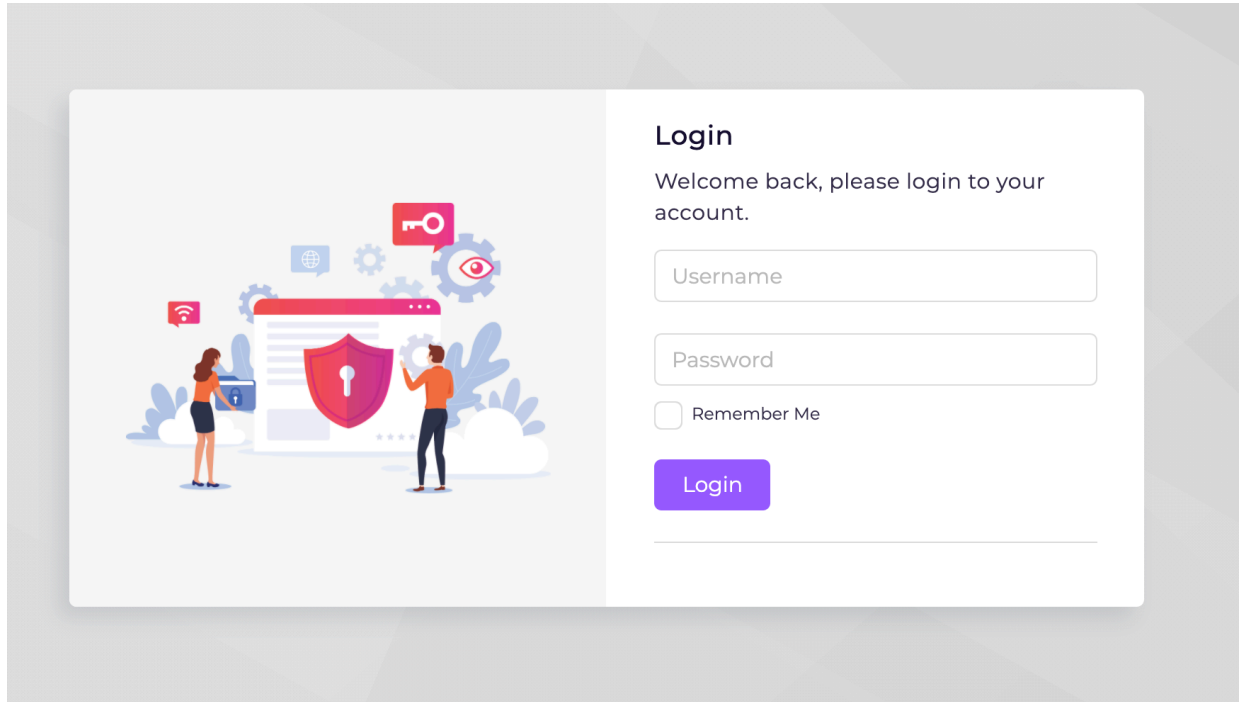
Use Case Name:	Display Stock Status Scenario: The system displays stock status by product
Summary:	This use case allows a registered user to analyze stock status per product
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to generate stock status report2. The system displays status product by product<ol style="list-style-type: none">a. Product nameb. Quantityc. Base price3. The system completes the report generation and displays above data within a table.
Alternative Flows:	<p>Step 4: If the quantity of the product less than 5 row will be colored with RED</p> <p>Step 5: If the quantity of the product between 5 to 15, row will be colored with YELLOW</p> <p>Step 6: If the quantity of the product more than 15 row will be colored with GREEN</p>
Extension Points:	none
Preconditions:	The user is logged in and has requested to generate stock status report
Postconditions:	Stock status report has been generated

Generate Profit & Loss Report (MANAGER)

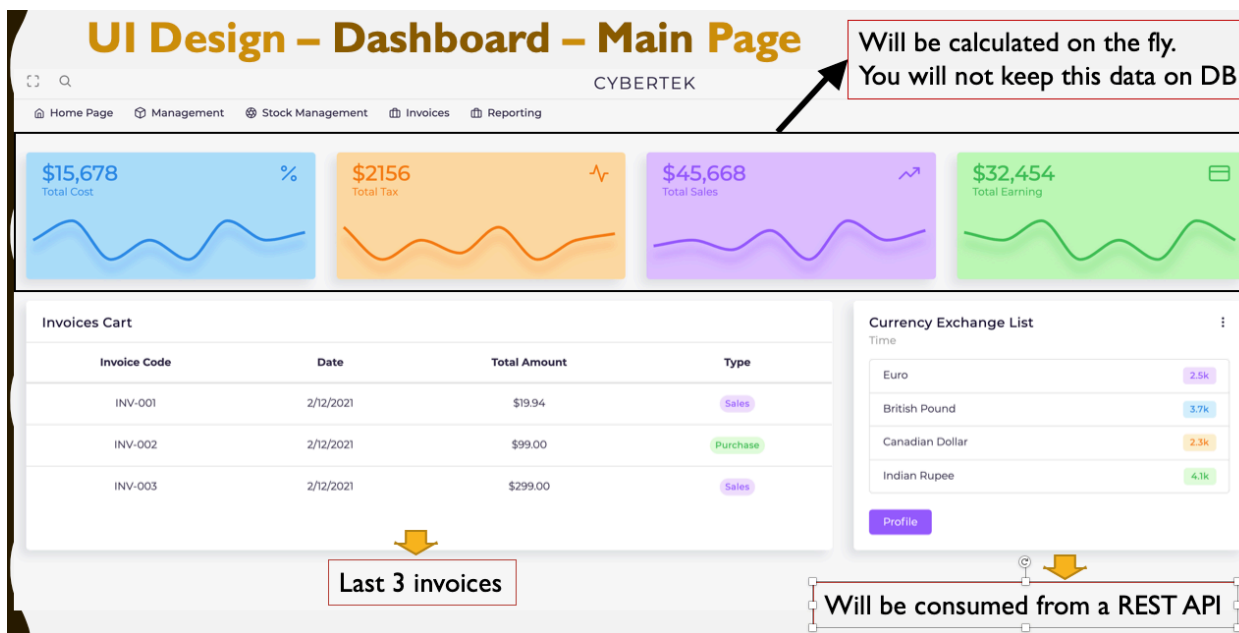
Use Case Name:	Display Profit & Loss Report Scenario: The system displays profit or loss for actual year
Summary:	This use case allows a registered user to analyze profit and loss report per product
Basic Flow:	<ol style="list-style-type: none">1. The use case starts when a user indicates he wants to generate PR report2. The system displays status product by product<ol style="list-style-type: none">a. Product nameb. Monthc. Total Selld. Total Purchasee. Total Profit / Loss (Summary Total)3. The system completes the report generation and displays above data within a table.
Alternative Flows:	Step 4: If the summary less than 0 row will be colored with RED Step 5: If the summary above than 0 row will be colored with GREEN
Extension Points:	none
Preconditions:	The user is logged in and has requested to generate PR report
Postconditions:	PR report has been generated

4. Mock User Interface Design

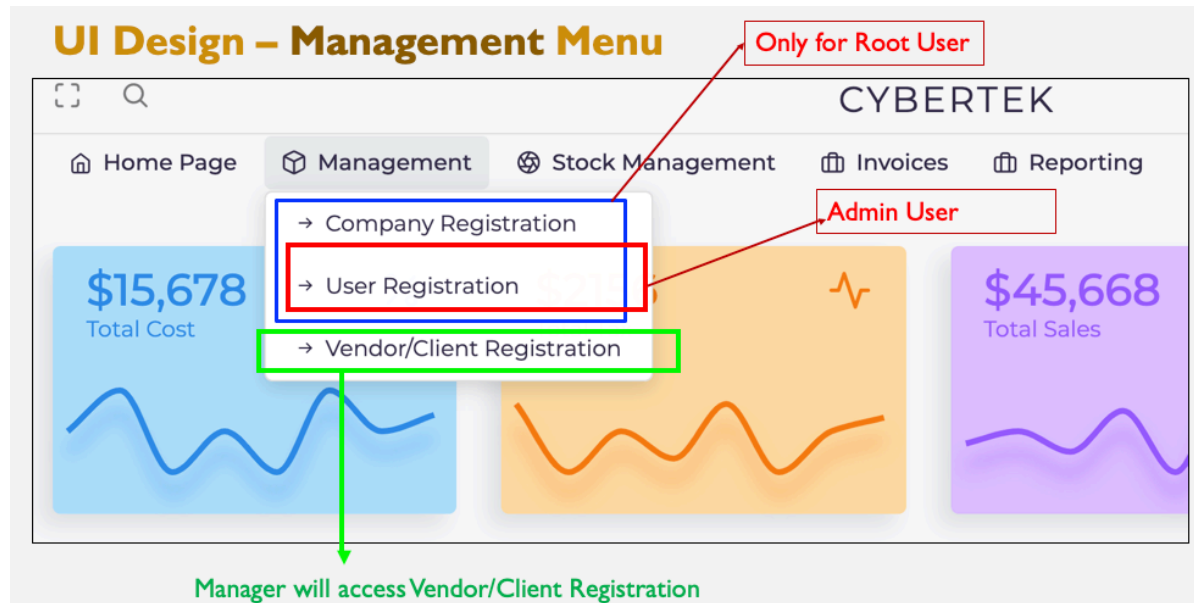
4.1 Login Page



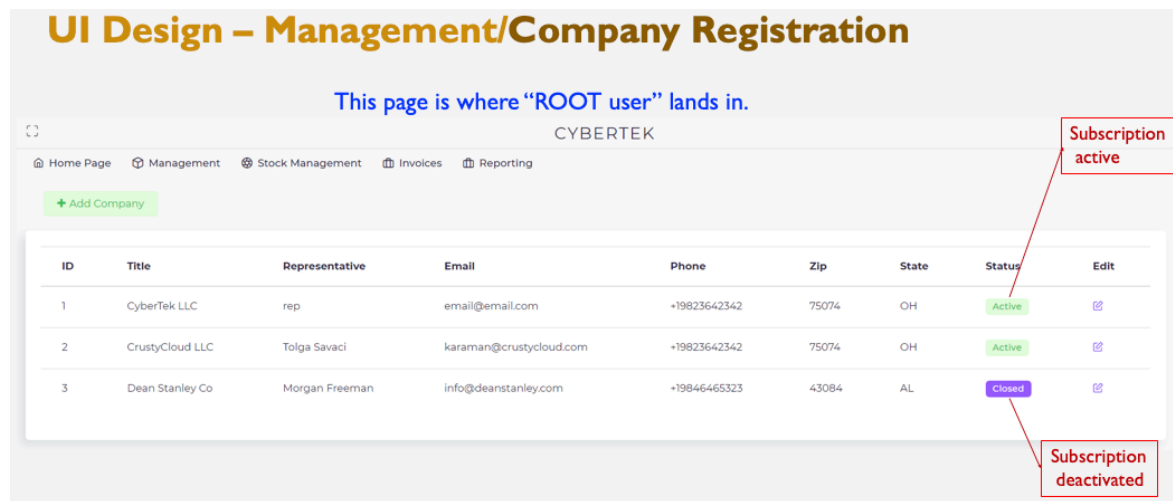
4.2 Main Page (Dashboard)



4.3 Management Menu



4.4 Company Registration Menu-Company List



4.5 Company Add Menu

UI Design – Management/Company Add

CYBERTEK

Home Page Management Stock Management Invoices Reporting

Company List

TITLE
dean3004

STATE
Select State

ZIP
43082

STATUS
Select Status

ADDRESS
973 Polaris Crossing Way Westerville

REPRESENTATIVE
Representative

E-MAIL
deanstanley@gmail.com

PHONE
9734157843

ESTABLISHMENT DATE
02.02.2020

Save Changes Cancel


4.6 User Registration Menu-List of Users

UI Design – Management/User Registration

CYBERTEK

Home Page Management Stock Management Invoices Reporting

+ Add User

ID	Firstname	Lastname	Email	Phone	Role	Corp	Status	Edit
1	Shaun	Freman	info@deanstanley.com	+1985647842	ADMIN	Dean Stanley Co	Active	
1	Shaun	Freman	info@deanstanley.com	+1985647842	ADMIN	Dean Stanley Co	Passive	
1	Shaun	Freman	info@deanstanley.com	+1985647842	ADMIN	Dean Stanley Co	Active	

Hint 1: Root user would only see ADMINS of companies !

Hint 2: If the company is deactivated then all users of that company should be disabled!



4.7 User Registration Menu-Add User

UI Design – Management/User Registration/Add

CYBERTEK

Home Page Management Stock Management Invoices Reporting

User List

FIRSTNAME: dean3004

LASTNAME: Lastname

PASSWORD:

PHONE: 9734157843

E-MAIL: deanstanley@gmail.com

ROLE: Select Role

COMPANY: Select Company

STATUS: Select Status

Save Changes Delete Company Cancel

4.8 Client/ Vendor Registration Menu-List of Client/Vendors

UI Design – Management/Client-Vendor Registration

CYBERTEK

Home Page Management Stock Management Invoices Reporting

+ Add Vendor/Client

ID	Company Name	Phone	Email	Type	ZipCode	Address	State	Status
1	Active azure	+142356662	active@azure.com	VENDOR	3245324	TX	Auckland Hill 14	Active
2	Bayou Tracking	+142356662	bayou@tracking.com	CLIENT	234245	PH	Chesterfield Industrial Park 26	Active

Hint: List all Client/Vendors, active ones on top. **Hint:** This page is for MANAGER type user.

4.9 Client/ Vendor Registration Menu- Client/Vendor Add

UI Design – Management/Client-Vendor Add/Update

CYBERTEK

Home Page Management Stock Management Invoices Reporting

Vendor/Client List

NAME: Bayou Tracking

ZIPCODE: 234245

PHONE: +142356662

ADDRESS: PH

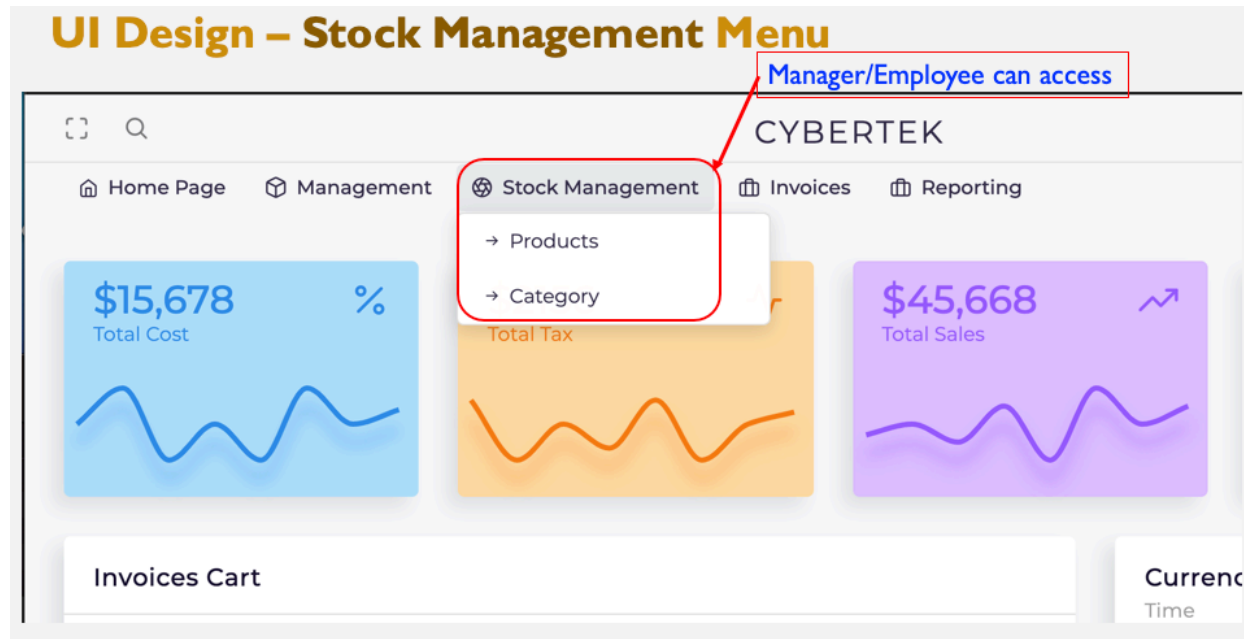
E-MAIL: bayou@tracking.com

STATE: Chesterfield Industrial Park 26

TYPE: ☐ VENDOR ☒ CLIENT ☐ BOTH

Save Changes Delete Cancel

4.10 Stock Management Menu



4.11 Stock Management Menu – Products

UI Design – Stock Management/Products-List

CYBERTEK

Home Page Management **Stock Management** Invoices Reporting

+ Add Product For Manager

ID	Name	Description	Quantity	Unit	Category	Status	Edit
1	PC	HP Pavilion Laptop 17"	34	Piece	Electronic	Active	
1	TV	LG Smart	5	Piece	Electronic	Active	
1	Cheese	ABC Ceddar Chese	0	LB	Dairy	Passive	

4.12 Stock Management Menu – Add Product

UI Design – Stock Management/Products - Add

CYBERTEK

Home Page Management Stock Management Invoices Reporting

Product List

NAME: Apple

DESCRIPTION: Lastname

QUANTITY: Quantity

TAX: Tax

CATEGORY: Select Category

UNIT: Select Unit

STATUS: Select Status

Create Cancel

4.13 Stock Management Menu – Category

UI Design – Stock Management/Category-List

CYBERTEK

Home Page Management Stock Management Invoices Reporting

+ Add Product Category

ID	Description	Status	Edit
1	Food	Active	Edit
1	Electronic	Passive	Edit

4.14 Stock Management Menu – Add Category

UI Design – Stock Management/Category-Add

CYBERTEK

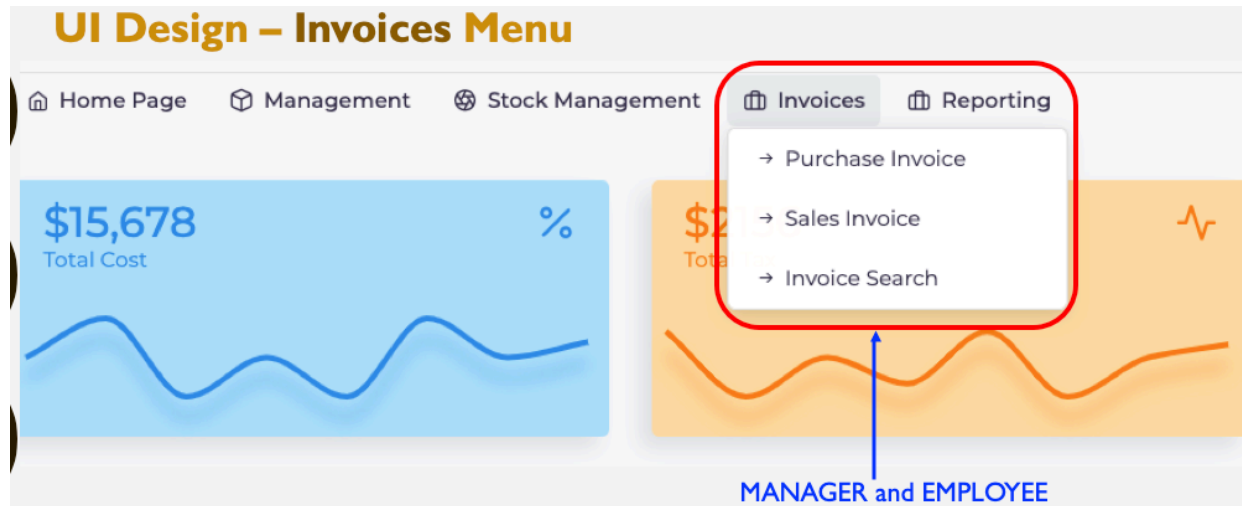
Home Page Management Stock Management Invoices Reporting

Product Category List

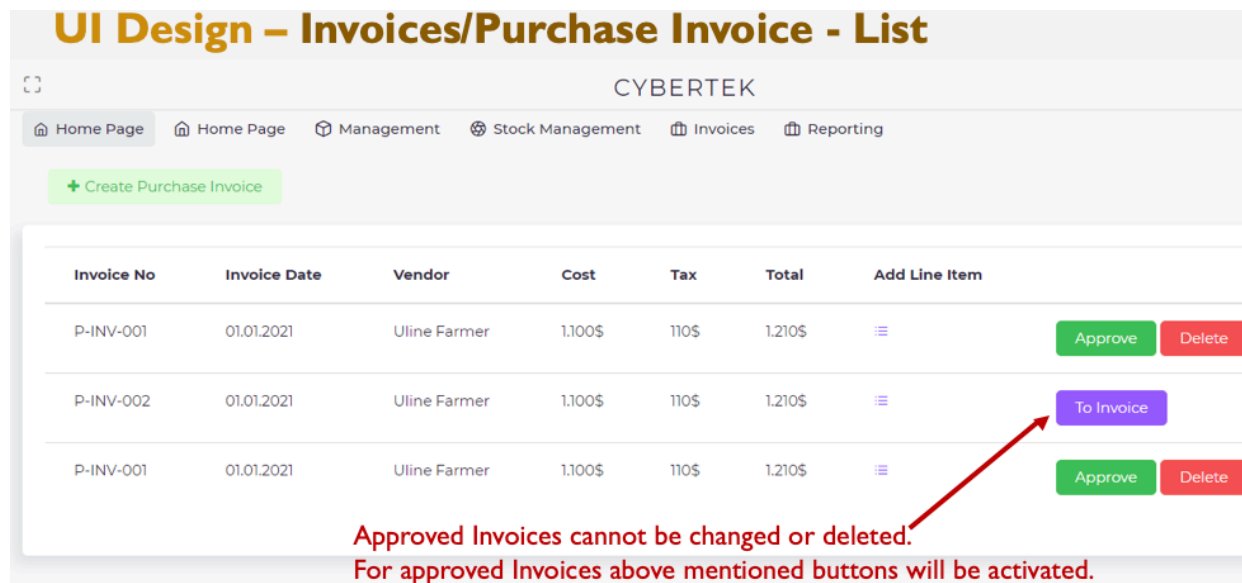
DESCRIPTION: Please Enter Category Description

Save Changes Cancel

4.15 Invoices Menu



4.16 Invoices Menu – Purchase Invoice



4.17 Invoices Menu – Purchase Invoice-Create

UI Design – Invoices/Purchase Invoice - Create

Home Page Management Stock Management Invoices Reporting

Purchase Invoice List

INVOICE NO: P INV 001 INVOICE DATE: 01.01.2020

VENDOR: Acme Corp PRODUCT: Select Product QUANTITY: 2 PRICE: 648

Add Item

Product	Price	Quantity	Total	Delete
PC	600\$	2	1,200\$	
PC	600\$	2	1,200\$	
PC	600\$	2	1,200\$	

Done Cancel

4.18 Invoices Menu – Purchase Invoice-Add Line Item

UI Design – Invoices/Purchase Invoice – Add Line Item

Home Page Management Stock Management Invoices Reporting

Purchase Invoice List

INVOICE NO: P INV 001 INVOICE DATE: 01.01.2020

VENDOR: Acme Corp PRODUCT: Select Product QUANTITY: 2 PRICE: 648

Add Item

Product	Price	Quantity	Total	Delete
PC	600\$	2	1,200\$	
PC	600\$	2	1,200\$	
PC	600\$	2	1,200\$	

Done Cancel

4.19 Sample Invoice

Invoice

Cybertek
4025 Oak Avenue,
VA, USA

INVOICE

INV-001001

Balance Due
\$12,000.00

Bill To
ACME Corp
Westerville, OH

Invoice Date : 06/05/2016

#	Item & Description	Qty	Price	Amount
1	Create PSD for mobile APP Simply dummy text of the printing and typesetting industry.	\$20.00/hr	120	\$2400.00
2	iOS Application Development Pellentesque maximus feugiat lorem at cursus.	\$25.00/hr	260	\$6500.00
3	WordPress Template Development Vestibulum euismod est eu elit convallis.	\$20.00/hr	300	\$6000.00

Total due


Sub Total \$14,900.00

TAX (12%) \$1,788.00

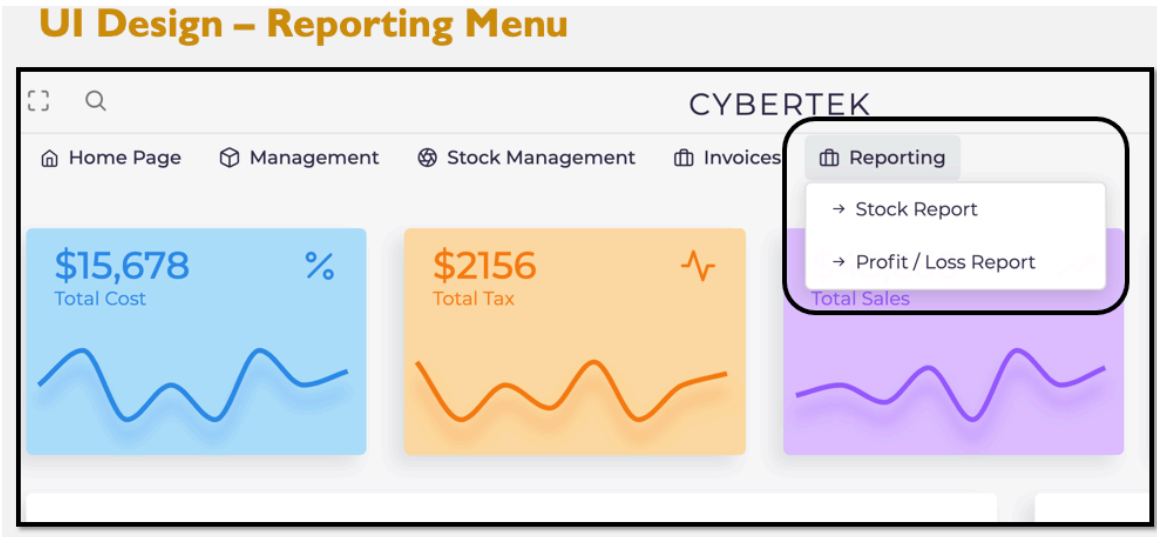
Total \$16,688.00

Authorized person

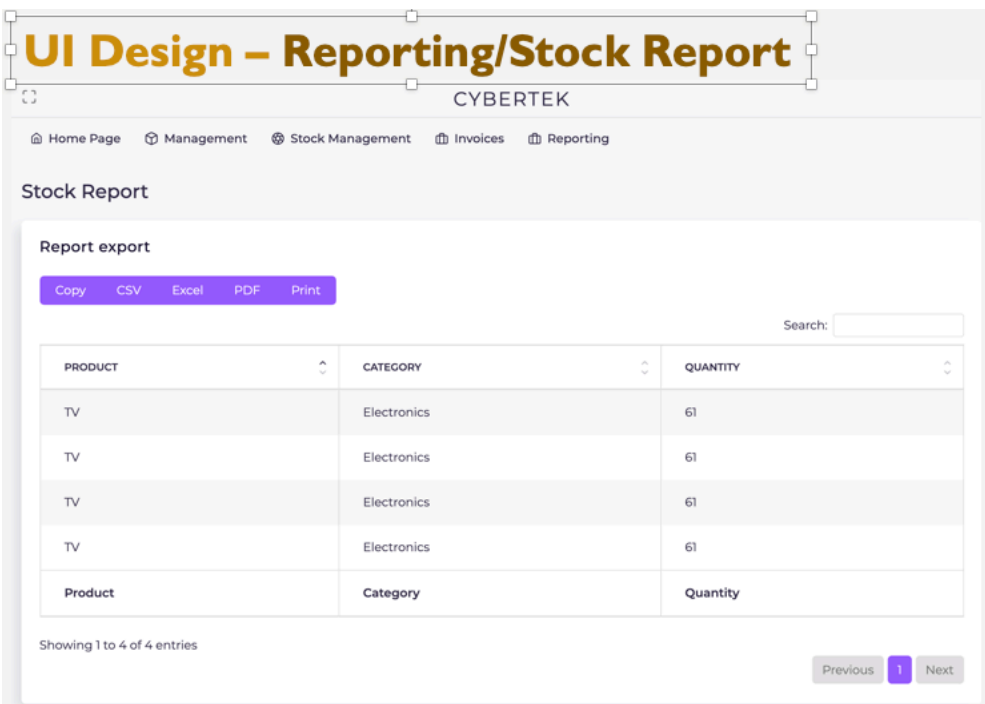
Amanda Orton
Managing Director

 Print Invoice

4.20 Reporting Menu



4.21 Reporting Menu-Stock Report



4.22 Reporting Menu-Stock Report

UI Design – Reporting/Profit-Loss

CYBERTEK

[Home Page](#) [Home Page](#) [Management](#) [Stock Management](#) [Invoices](#) [Reporting](#)

Profit Loss Report

Report export

[Copy](#) [CSV](#) [Excel](#) [PDF](#) [Print](#)

Search:

MONTH	TOTAL PURCHASE	TOTAL TAX	TOTAL COST	TOTAL SALES	PROFIT/ LOSS
Feb	1.000\$	120\$	1.120\$	2.220\$	1.100\$
Jan	1.000\$	120\$	1.120\$	2.220\$	1.100\$
Month	Total Purchase	Total Tax	Total Cost	Total Sales	Profit/ Loss

Showing 1 to 2 of 2 entries

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5. Database Design (E-R Diagram)

