Independent University, Bangladesh

An Inventory Management System for RAK Ceramics

An undergraduate internship report submitted by

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In consideration of the partial fulfillment of the requirements for the degree of

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ABSTRACT

Inventory management software is a software system for tracking inventory levels, orders, sales and deliveries. It can also be used in the manufacturing industry to create a work order, bill of materials and other production-related documents. Companies use inventory management software to avoid product overstock and outages. It is a tool for organizing inventory data that before was generally stored in hard-copy form or in spreadsheets.

Over Inventory management software is made up of several key components working together to create a cohesive inventory of many organization's systems. These features include:

Reorder point

Should inventory reach a specific threshold, a company's inventory management system can be programmed to tell managers to reorder that product. This helps companies avoid running out of products or tying up too much capital in inventory.

Asset tracking

When a product is in a warehouse or store, it can be tracked via its barcode and/or other tracking criteria, such as serial number, lot number or revision number. Systems. for Business, Encyclopedia of Business, 2nd ed. Nowadays, inventory management software often utilizes barcode, radio-frequency identification (RFID), and/or wireless tracking technology.

Service management

Companies that are primarily service-oriented rather than product-oriented can use inventory management software to track the cost of the materials they use to provide services, such as cleaning supplies. This way, they can attach prices to their services that reflect the total cost of performing them.

Product identification

Barcodes are often the means whereby data on products and orders are inputted into inventory management software. A barcode reader is used to read barcodes and look up information on the products they represent. Radio-frequency identification (RFID) tags and wireless methods of product identification are also growing in popularity.

Modern inventory software programs may use QR codes or NFC tags to identify inventory items and smartphones as scanners. This method provides an option for businesses to track inventory using barcode scanning without a need to purchase expensive scanning hardware.

Before this software was developed, the whole process for this functionality was being done with a desktop-based software. Since the company has grown bigger, a web-based software is essential for the company in order to keep all the systems in check.

The system design is using the Model, View, and Controller (MVC) architecture, and implemented using the power of Laravel Framework. JavaScript is adding to the application to improve the use of the system. MySQL used for the Application Database. Insertions, deletions, and changes of data in the system can do straightforward via the designed GUI without interacting with the tables. Different presentation of information is obtainable from the system. The test case of the system exposed that the system is working enormously and is ready to use and manage almost all the system that were planned at the initialization of the project.

The report is broadly categorized into twelve different chapters. At first there is an Introduction, Background & Objectives of the Project, Scope & out of Scope of the Project. Chapter two is the Overview of RAK Ceramics Bangladesh (company profile). Chapter three focuses on Literature Review. Chapter four discuss about Customer requirement analysis; Chapter five will tell about system and its functionality.

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1. Introduction

Companies often use inventory management software to reduce their carrying costs. The software is used to track products and parts as they are transported from a vendor to a warehouse, between warehouses, and finally to a retail location or directly to a customer.

IMS shapes an interaction between human resource management and information technology. It merges IM as a discipline and in particular its basic HR activities and processes with the information technology field, whereas the planning and programming of data processing system evolved into standardized routines and packages of enterprise resource planning [ERP] software. On the whole, these ERP System have their origin on software that integrates information from different applications into one universal database. The linkage of its financial and human resource modules through one data base is the most important distinction to the individually and propriety developed predecessors, which make this software rigid and flexible.

1.1 Background

"IMS is the handy software application helps the employer take care of the host of human resource functions using just one handy tool."

Rather than taking products attendance in one database program and products performance reviews in another word processing program, an employer can use IMS to consolidate all of that data into one convenient product profile system.

Using IMS, an employer can configure payroll and benefits systems create and manage training systems and even track performance review. This kind of electronic data tracking makes managing products needs much easier and enables products to focus on other needs. Even if an employer does have a human resource director, IMS can streamline the process of keeping track of product's payroll, benefits and review data.

Application of IMS

- Administrative management
- Product information management
- Succession planning
- Flexible-benefits administration
- Product reporting

- Stuff benefit management
- Product Transfer Information
- Reports

1.2 Objectives

Objectives of the Human Resource Management System

Tracking your inventory is important at every stage. Many systems allow you to track your inventory by serial numbers, RFID tags, barcodes and other IDs. These tools make it easy to quickly process inventory data when it first makes its way into your warehouse. They also provide an audit of all inventory movement. This is especially important for industries that deal in perishables or consumables. If you ever find yourself needing to recall a certain product, traceability allows you to recall only the products affected. Without traceability, you risk having to recall all items, affected or not, and losing massive amounts of revenue.

Some systems provide traceability that's built with pick and put away in mind. First, a quick scan of the tracking tags tells you the location of stock in your warehouse. Then, your system uses that information to optimize the pick and put away processes by creating efficient routes for your workers. Reduce movement without purpose in your warehouse to boost productivity and cut labor costs.

- Product Tracking
- Advanced Inventory Tagging
- Audit Trail
- Transfer Management

Enterprise businesses that manage multiple sites have the advantage of moving their product to where it's most valuable. Bundling or kitting your products can be attractive to customers, especially during certain times of the year. In order to do this most effectively, you'll want a system equipped with transfer management.

Transfer management enables you to track your inventory as it moves to different sites and facilitates the overall transfer process. Some modules offer specialized systems like pick-to-light and voice picking to facilitate this. These systems can help guide and direct your workforce to reduce any confusion and streamline their efforts.

- Multi-Location Tracking
- Stock Transfer
- Order Picking
- Kitting and Product Bundling
- Voice Picking

- Pick-to-Light (PTL)
- Purchasing

Purchasing is an incredibly important feature to any warehouse that heavily relies on vendor goods to produce their own. This feature mainly works to help users create and manage purchase orders (POs). Many systems include templates that automatically populate with existing data from other parts of the system. Users may also find it helpful to email suppliers directly from their inventory control system, which reduces the amount of time spent switching screens.

1.3 Process

Having good shipping capability is extremely important to overall order fulfillment and customer satisfaction levels. It's good to choose a system that can automate much of the process to reduce any errors your customers may experience, such as late deliveries or incorrect packages.

Standard shipping tools typically include the ability to print product labels and barcodes. You may also desire a solution that integrates with top third-party providers like UPS and FedEx. But there are more advanced features of inventory management systems like the ability to dispatch orders as multiple shipments. This ensures your customers get their in-stock goods quickly with backordered items sent at a later time. Some systems allow you to ship by lot IDs, which is great for FIFO and LIFO shipments.

- Labeling
- Multi-Carrier Shipping
- Multiple Shipment Orders
- Shipment by ID

Order Management

Most vendors offer an inventory management system that can help you manage your sales orders. These tools allow users to customize pricing, send quotes, track orders and manage returns. Some advanced systems sync orders with inventory levels, mark items for shipment, support multichannel sales and make auto-adjustments to maintain profitability. Order management is an essential feature to increasing and maintaining customer satisfaction.

- Order Tracking
- Sales Order
- Quotations
- Order Editing
- Customer Pricing
- Multichannel Sales
- Returns

Reporting and Analytics

Analytics and reporting are excellent tools to have on hand as you plan to grow your business. Analytics tools evaluate patterns in your processes to forecast future demand and sales. Predicting demand is a way to reduce safety stock and carrying costs. Keeping inventory around simply for safety's sake is no longer necessary when you have great insights into how much you'll actually need.

1.4 Scope and Modules

Deployment

Since not every system offers both methods of deployment, you'll have to consider which is best for your company before you shortlist. Cloud-based products typically have fewer sunk costs, offer better visibility and maintain a backup of your data. But many companies prefer on-premise due to privacy concerns or industry compliance standards. There are also several types of cloud deployment methods like SaaS, PaaS and IaaS. Some products may offer you deployment options that are more specified, so it's important to understand the differences.

- On-premise
- Web-based

This aspect affects what hardware we'll be managing your processes on and if we'll be able to do it remotely. Many systems offer a mobile website, which enables users to access the system from any desktop. If you utilize tablets, phones or other mobile devices, check to see if a vendor offers a native application. Mobile support is often OS specific, so it's important to keep that in mind as well. While most vendors try to support all popular platforms, it's not a universal concern. So, it's always important that the inventory app you invest in can run on your existing hardware.

- Native Application
- Mobile Website
- Operating System

Integration

If you use multiple systems for your business, it's important they integrate well. It could be beneficial to integrate your other supply chain systems, CRM and e-Commerce platform. Centralizing business functions that used to only exist as separate processes is one of the greatest benefits to business software. If your systems can't share information freely, you're not getting the most from them.

2.Company Profile

RAK Ceramics P.J.S.C is one of the largest ceramics brands in the world. Headquartered in the emirate of Ras Al Khaimah in the United Arab Emirates, RAK Ceramics has an annual production capacity of 110 million square metres of tiles, 5 million pieces of sanitaryware, 24 million pieces of porcelain tableware and 600,000 pieces of faucets. The company employs 15,000 people across its operations in the UAE, India, Bangladesh, Iran, Europe, Australia and Singapore.

RAK Ceramics specializes in ceramic and gres porcelain wall and floor tiles, sanitaryware, kitchen sinks, including faucets for walls, floors, bathrooms and kitchens.

RAK Ceramics has ten tile plants, two sanitaryware plants and one plant each for faucets and tableware at its headquarters in RAK, as well as overseas plants in India, Bangladesh and Iran.

In June 2014, Samena Capital bought a 30.6% stake of the business. Samena Capital is an Asia, India and MENA-focused alternative investments group, co-established in 2008 by Shirish Saraf and key partners from a cross section of industries and regions.

RAK Ceramics has a strategy focusing on its four core sectors: tiles, bathware, porcelain tableware and faucets.

RAK Ceramics is a publicly listed company on the Abu Dhabi Securities Exchange in the United Arab Emirates and on the Dhaka Stock Exchange in Bangladesh and as a group the company has an annual turnover of approximately US$1 billion.

RAK Ceramics UAE supplies to more than 150 countries worldwide, Some major consumers of RAK Ceramics are Pakistan and England..

2.1 Vision and Mission statement

History/Origins

RAK Ceramics was established in Ras Al Khaimah in 1989 by H.H. Sheikh Saud Bin Saqr Al Qasimi, member of the Supreme Council and Ruler of Ras Al Khaimah.

Incorporation and growth

In 1993 RAK Ceramics opened of its first sanitaryware plant in Ras Al Khaimah By the year 2000, the company had opened its first overseas plant in Bangladesh.

From 2000 to 2004, RAK Ceramics invested heavily, expanding the company, and exporting to almost 120 countries by 2004. In 2010 RAK Ceramics becomes the world’s largest ceramics manufacturer and by 2012, RAK Ceramics had supplied 1 billion square metres of tiles to projects around the world since the company began.

Recent history

In June 2014, the board agreed to sell a 30.6% equity stake to Samena Capital on a proprietary basis. Given the size of the transaction, Samena Capital formed a consortium of co-investors which included two GCC sovereign wealth funds, a blue-chip Saudi family[who?] and existing high net worth shareholders.

In 2015, following the acquisition, the board approved the implementation of a Value Creation plan which was designed to streamline operations and unlock value across every aspect of the business.

Ownership

The largest shareholder of RAK Ceramics is now Samena Capital with a 30.6% stake in the business. Other shareholders include its founder, Sheikh Saud bin Saqr al Qasimi, the ruler of Ras Al Khaimah; the Government of Ras Al Khaimah; Emirates Rock and Marble Company; and one of Sheikh Saud's brothers, Sheikh Omar Bin Saqr Al Qasimi.

Affiliates abroad

In addition to its production facilities in Ras Al Khaimah, RAK Ceramics operates plants in Bangladesh, India and Iran. In August 2015 the company acquired the remaining 20% minority share of its Iran facility, making RAK Iran a wholly owned subsidiary of RAK Ceramics. In October 2015 the company acquired the remaining 8% minority share of its India facility, making RAK India a wholly owned subsidiary of RAK Ceramics.

In 2015 RAK Ceramics focused on acquisitions aimed at strengthening the control of the Group over its subsidiaries, acquiring 100% of its subsidiaries in Iran and India, and in early 2016 RAK Ceramics acquired the remaining shares in its subsidiaries in the UK, Italy, Germany and Australia.

In 2017 RAK Ceramics has made a Joint Venture in Morbi, India with GRYPHON Ceramics. RAK Ceramics holds 51% stakes in GRYPHON along with the other local partners. In Gryphon they are making large format porcelain slabs. The company started producing big slabs in February, 2019,

Core markets

The company’s core markets are the UAE, Saudi Arabia and the wider GCC, India, Bangladesh, UK, Germany, Italy and the Levant. RAK Ceramics holds the highest market share for both tiles and sanitaryware in the UAE and Bangladesh and has the highest production capacity in the GCC.

Materials and technology

Raw materials are sourced locally (sand, quartz and feldspar) as well as from all over the world (kaolin, ball clay and feldspar).

A wide range of technologies are used at the company’s plants some of which include digital printing technology, continua+, chroma, slim, anti-microbial, glow in the dark, double charge, roll feed and other technologies.

Products

In tiles RAK Ceramics offers one of the largest collections of ceramic wall and floor tiles, gres porcelain and super-sized slabs in the industry. Offering more than 6,000 production models, tiles are manufactured in a variety of sizes, from the smallest 10x10cm up to the largest in the region at 135x305cm, the widest range offered in the ceramics field.

RAK Porcelain offers porcelain tableware for the hotel, restaurant and hospitality segment. Its products are now supplied to over 20,000 star-rated hotels across more than 140 countries with customers including J W Marriott, Hilton, Hyatt, and Sheraton amongst others.

Human resources

Since its creation in 1989, RAK Ceramics has provided employment for approximately 6,000 Asian migrant workers. At present, around 8,000 products work for the company in the UAE and a total of 15,000 worldwide.

The company employs staff from all over the world including the UAE, Lebanon, India, Bangladesh, Philippines, China, Sudan, Egypt, Morocco, Armenia, Syria, Italy, Switzerland, Holland, Germany, UK, and other countries at the headquarters in Ras Al Khaimah.

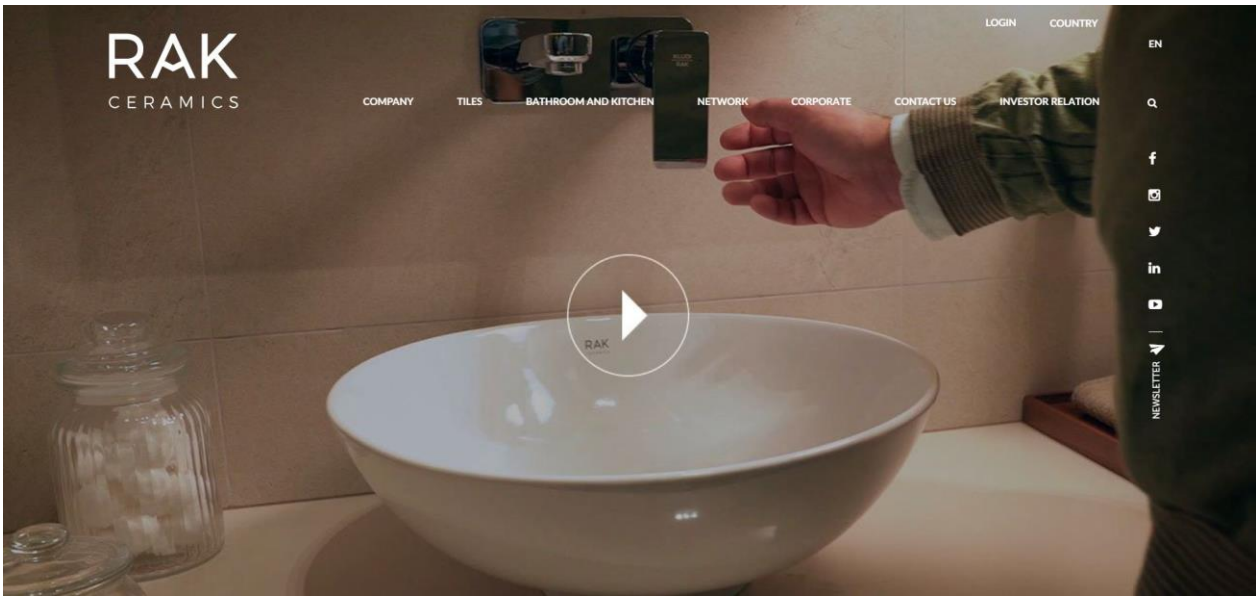

Figure 1 : RAK Ceramics Bangladesh Website

1. Literature Review

3.1 Introduction

An inventory management system (or inventory system) is the process by which you track your goods throughout your entire supply chain, from purchasing to production to end sales. It governs how you approach inventory management for your business.

Any venture that handles stock will need a system to accurately track and control it. Without one, you'll be working on an entirely ad-hoc basis and you'll quickly run into situations where your business is overstocked or understocked.

Inventory systems tell you the number of components or ingredients you need to create or assemble your final product. Without this information you may end up with excess stock, eroding your bottom line, or with insufficient stock to meet customer demand.

But while you will need an inventory management system, which one you choose is entirely up to you. There are countless different systems you can adopt, ranging from simple approaches to comprehensive solutions.

3.2 Similar Software analysis

Zoho Inventory

Zoho Inventory enables businesses to automate their order and inventory management and track their delivery. It is an ideal app for eCommerce businesses of all scales. Plus, the solution integrates seamlessly with popular shipping systems and cloud retailers.

What gets Zoho Inventory a place in this article on inventory management software reviews? The main advantage is it facilitates end-to-end tracking meaning it can monitor inventory from order to delivery. Plus, the app offers mobile tracking for iOS and Android devices. Other key features are a robust reporting and analytic kit. On top of that, the app works smoothly with other Zoho solutions and with important shipping providers, online retail platforms, and external systems. The best part is you can access this software's useful features at a cheaper rate compared to advanced inventory management platforms

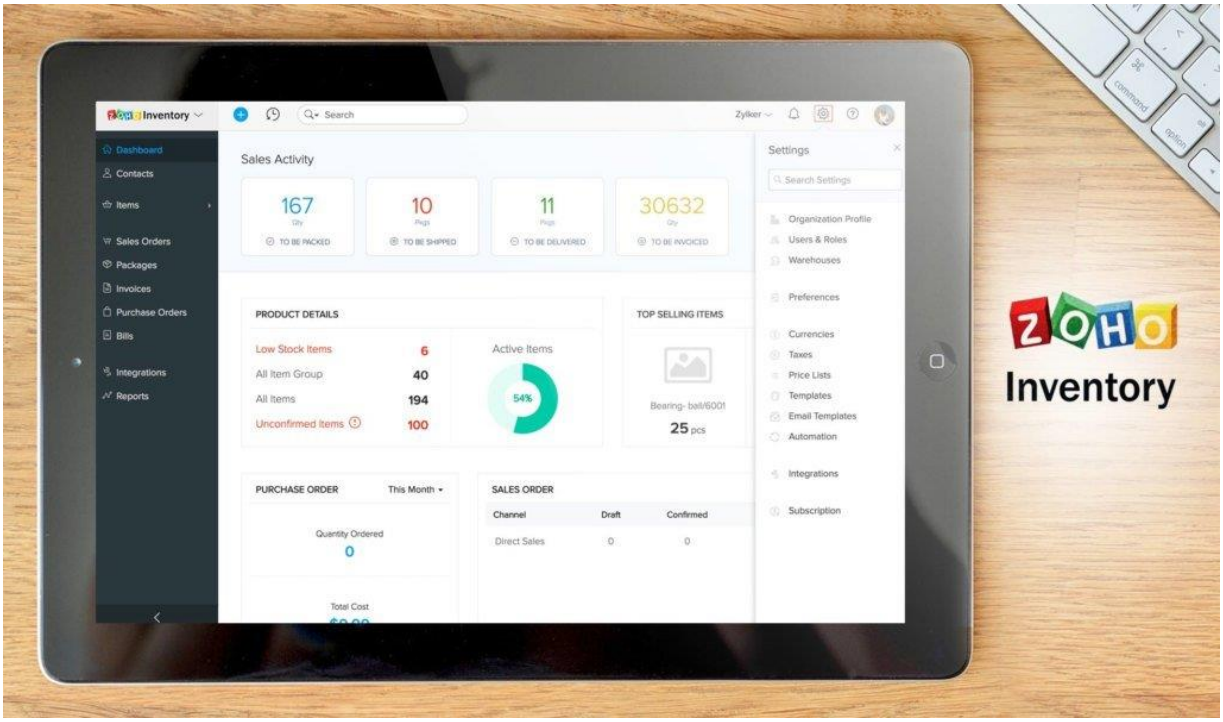

Figure 2 : ZOHO Inventory

Cin7

Cin7 provides a complete, automated point-of-sales package and inventory management suite created to cater to the needs different business sizes and industries. Fully cloud-based, the platform offers top-of-the-line features that let you sell and distribute your products more quickly and efficiently. It connects all your inventories and lets you manage multiple sales channels in one platform, giving you a better idea of how your stores and online sales are being managed across outlets.

In addition to being an all-in-one inventory, POS, EDI, and 3PL system, Cin7 can also be integrated with more than 100 third-party applications so you can have access to all the features you need in one

platform. This tool is also great for owners of online shops as it can be used alongside multiple eCommerce systems.

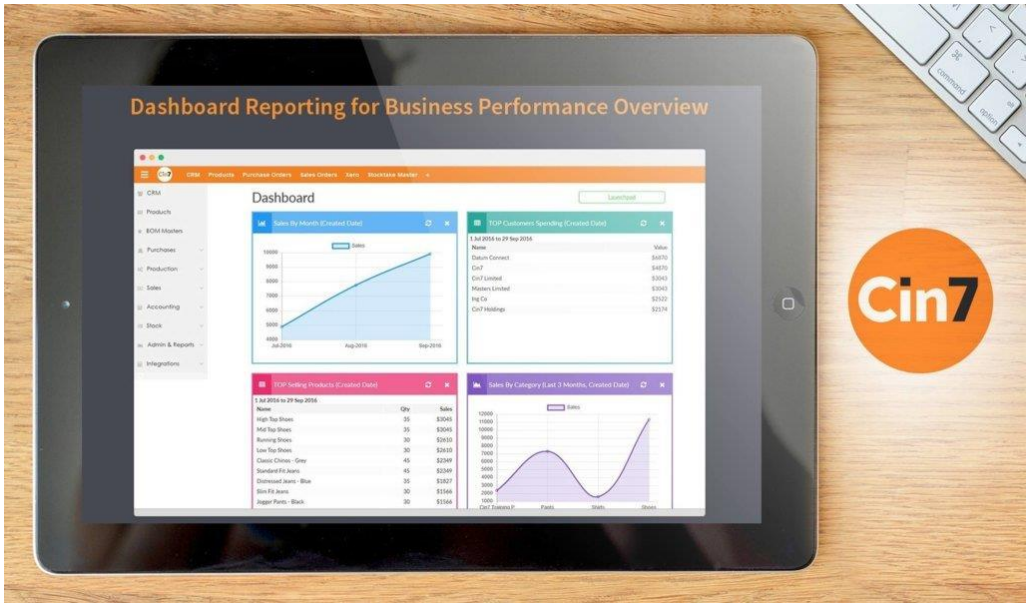

Figure 3 : CIN7t

4.Company Requirement Analysis

4.1 Introduction

The company requirements were specified and documented depending on the previous offline software. Although most of the companies of the world have been using IMS for a long time as a result of a need for reaching and managing the data of products, IMS projects are developed without there quired properties they to be well-formed. Unfortunately, this situation is not different in Bangladesh. Due to the rapid progress in companies like increase in number of the products, the increase in the expectations in products' skills and the variations of the product types, the existing IMS becomes inadequate to meet these required needs.

The aim is to develop a IMS in such a manner that it would be able to fulfill the upcoming changes in the needs of RAK Ceramics Bangladesh. In other words, our IMS will be a flexible system such that it could be improved according to the future needs of RAK Ceramics Bangladesh.

4.2 Product Information Management

IM solutions should include a complete directory of product profiles that can include personal information, job and stuff history, banking and tax details, insurance plans, time off requests, disciplinary history, performance feedback or any other custom fields important for the company. This keeps all of your products' information linked to the main record, for ease of tracking and reporting. ID systems can provide

an product self-service portal, letting them log in and view important information as well as a knowledge base of informative documents.

- Product Records and Database
- Product Self-Service Portal
- Inventory History
- Product History
- Disciplinary History
- PR details

4.3 Creating Accounts and Product Information

A comprehensive IM software will assist with all human resource responsibilities throughout the product lifecycle, beginning, of course, with recruitment and hiring. Human resource management software can completely streamline the hiring process for HR departments with automated HR system features.

- Product Requisitions
- Position Descriptions
- Account Evaluation
- Account Tracking

4.4 Product Management

Managing product details, including healthcare and all the contributions, is a major component of any IMS solution. The human resource management software features should facilitate the workflows and information for benefits. Additionally, permitting products to enroll in benefits through the IM minimizes errors and extraneous work.

- Benefits Administration
- Advance Product
- PF Product
- Fund and product Plans
- Travel Compensation
- Product approval and Information

4.5 Inventory History Management

Managing the payment of a workforce is one of the most integral duties of a human resource department. Through the use of an IM system, your business can streamline this essential HR functionality and ensure all products are properly compensated. Base stuff administration, bonus programs, commissions, and stock and long-term incentive management are included in various modules. Some IM solutions provide compensation management to simplify your company’s financial planning.

4.6. Reports

It is important to generate the reports of ID software for business will need in an IM system. This may include pay slip, stuff sheet, product Status, or continued management options such as product all info. It is essential to consider the existing technical know-how and infrastructure of your business when evaluating this category of reports.

- Product Slip
- Inventory Sheet
- Bonus Report

4.7. Technical Features

In addition to functionality requirements, it is equally important to evaluate the technical features of ID software your business will need in an IM system. This may include standard technology-related aspects like deployment options and mobile functionality, or continued management options such as security, governance and user support. It is essential to consider the existing technical know-how and infrastructure of your business when evaluating this category of features.

- Compliance Management
- Deployment Environments
- Security
- User Support
- Maintenance

5.System Analysis

5.1 Introduction

The overall description of our project can be stated as creating and managing the database, developing a friendly user interface to manipulate the database, provide an authentication mechanism to safely accomplish tasks mentioned above.

5.2 Product Perspective

Currently, RAK Ceramics Bangladesh has an IMS already in use. However, with the NEW IMS we will provide them with additional capabilities and properties organized neatly.

New IMS which is an online intranet System will be used by four types of products of RAK Ceramics Bangladesh. These types who have different roles can be stated as: **Admin, Manager, Stuff,** every user enters the main authentication page and after that, system will grant them authorization. After being authorized according to their permissions (role type) users will basically query and edit the database via IMS.

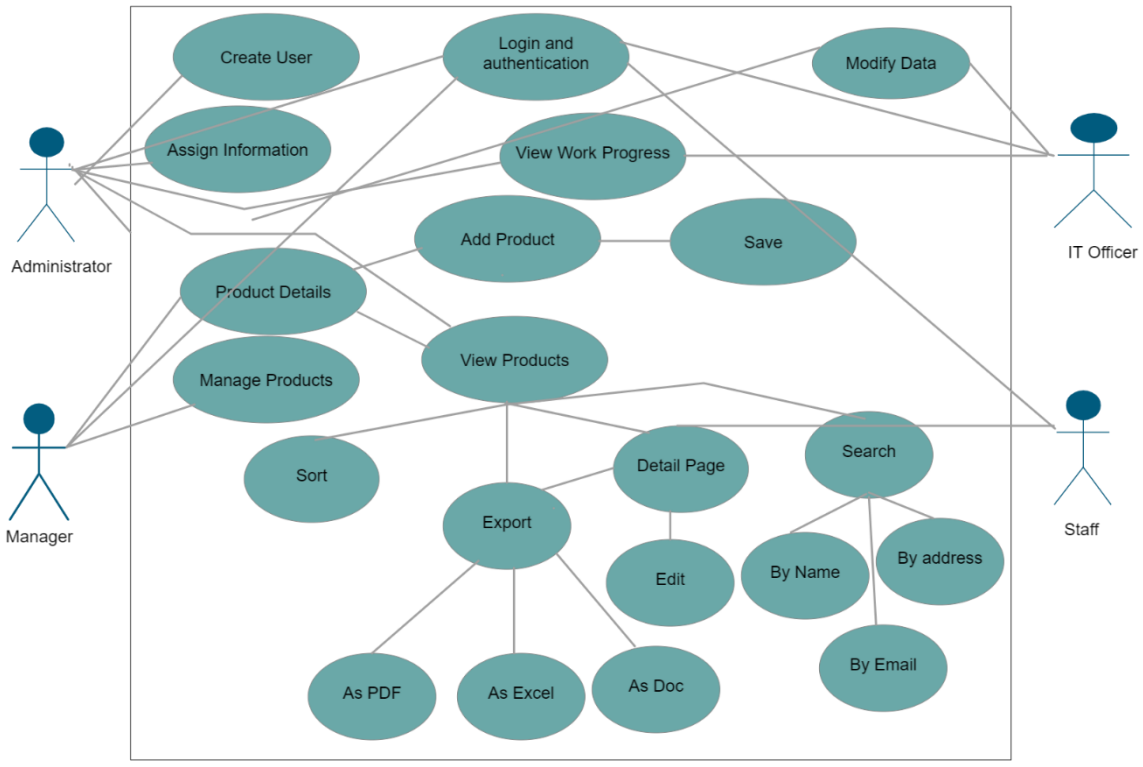

Figure 4 : General Use Case Diagram

5.3 Product Functions

RAK Ceramics IMS implements some major functions in order to accomplish required tasks. These functions constitute a basis for the whole system. These functions can be stated as:

5.3.1) Authentication and Authorization

Being connected to internet, users will be able to get into the system. In order to see the interface related to his/her role type, the users account should be authorized and also his/her user name and password should be authenticated. These tasks are basically held by the functions implemented under the header of Authentication and Authorization major function.

5.3.2) Process Data

These functions which can be examined in that process data major function are basically provides user to manage the database according to the desired task. These management tasks constitute the major feature of the IMS. With the help of these functions a user canupdate some basic personal data like contact information, marital status etc. In addition, to update data, a user can also search the database in order to obtain the list of the users' whichhas the properties desired. Also, a user may also see the specific information about a useror all users which can be named as report. In other words, searching is the operation with rows of the database while reporting is operation with columns of the database.

5.3.3) Product Creation

Recruitment of a new person which means introducing a new user to the system can be accomplished in two steps. When it is needed to add a new user to the system, firstly, HR must create an product account, by the way at this step IMS automatically gives an id to that user. At the second step, admin creates a user related to that user ID.

5.3.4) Editing Product Information

By editing a user info of a new person which means introducing a new user to the system can be accomplished in two steps. When it is needed to add a new user to the system, firstly, HR must create an product account, by the way at this step IMS automatically gives an id to that user. At the second step, admin creates a user related to that user id.

5.3.5) Submitting and Checking Product Information

When it is needed to add a new user to the system, firstly, HR must create an product account, by the way at this step IMS automatically gives an id to that user. At the second step, admin creates a user related to that user id.

5.3.6) Creating Category Profiles and Managing info

It is viable to create product profile and managing info for all the users in the company. It is what lenders see when they click on their product.

5.3.7) Generating Reports

In a software like this it is viable to generate reports in order to manage data and process it. For this software, all the reports will be generated as EXEL Sheet.

5.4 Constraints, Assumptions and Dependencies

Regularity Policies:

Each user must be a product of RAK Ceramics Bangladesh. In other words, each user has account created by HR and authenticated by admin.

Hardware Limitations

There is no limitation in the operating system in which IMS will work. However, the IMS system and the database will work on a server that needs to be always online. Users can access the system with any internet browser.

5.5 Specific Requirements

5.5.1 Interface Requirements

All the users will see the same page when they enter IMS. This page asks the users a user ID and a password.

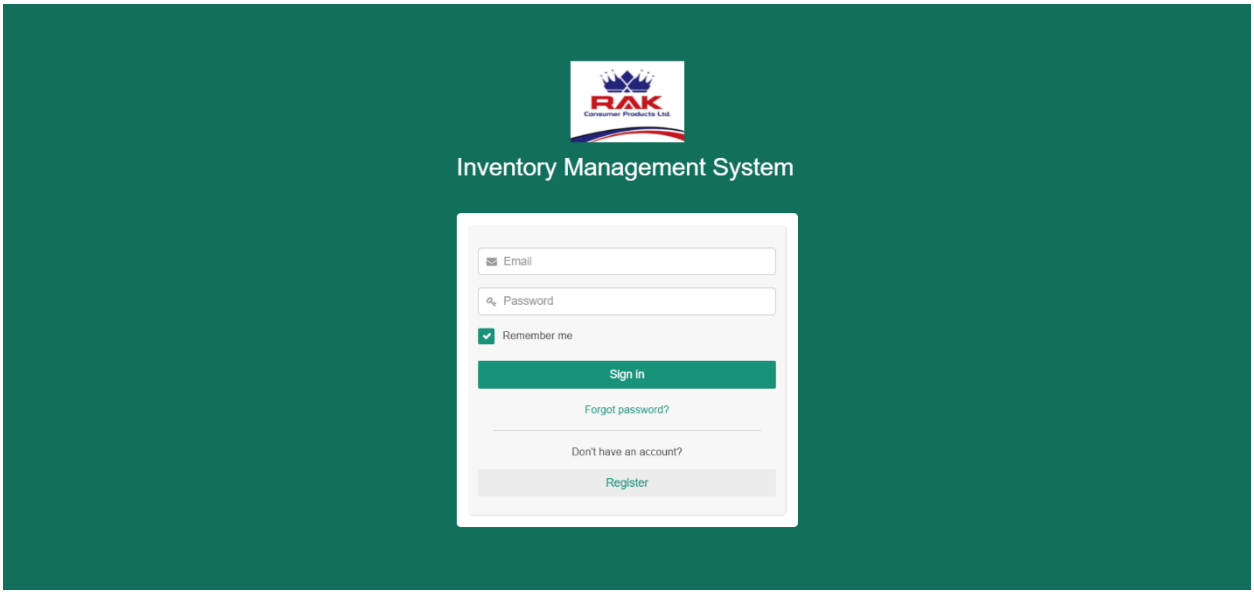

Figure 5 : Login Page of the IMS

After being authenticated users will see the interface containing the information of the login info and dashboard. This interface includes different menus according to their role types determined by admin at the

authentication phase. By the way, users may have more than one role. Then a user who has more than one role will be able to see all the menus that are related to his/her role types.

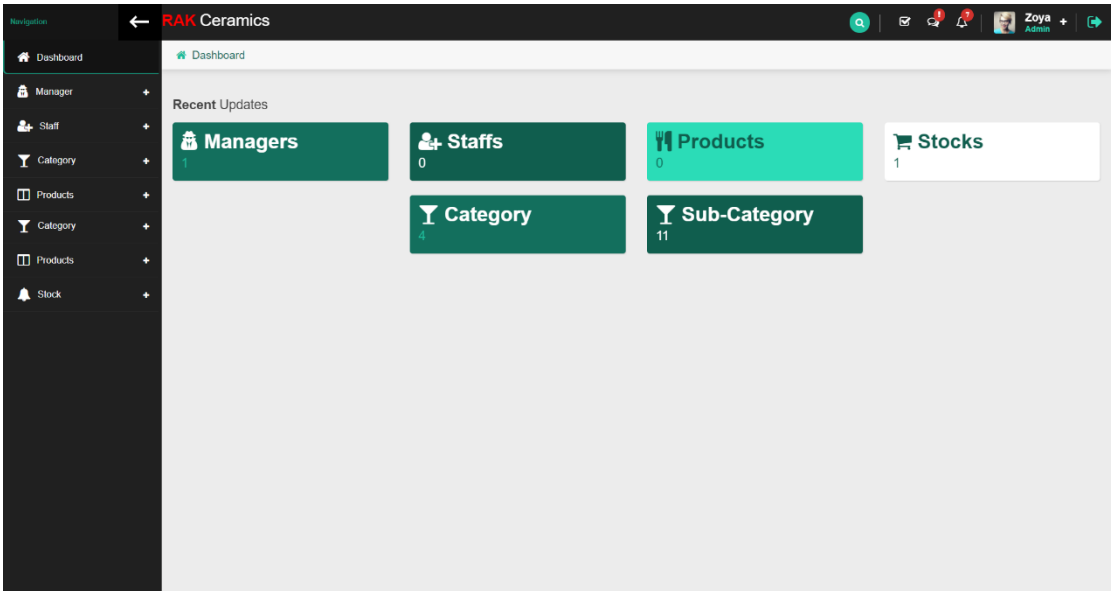

Figure 6 : Dashboard of an IT Manager

User who has product role have authorization to see only Personal profile management, HR role gives right to see Product List menus and Add New Product menu. Manager role gives authorization to see only Manager Tab. And Admin role gives user right to see User List menu and Arrange Roles menu. These authorizations are default ones but an admin can change these authorizations by Arrange Roles menu.

5.6 Menus

5.6.1 Administration Menu

With the help of this menu, Administration will be able to see all the product information which appears in a user-friendly design and also by means of this section, they may edit, create, update all product information including creating user roles and stuff policies in other words manage some personal information which are in the database such as contact information, stuff information and stuff management. This menu will only be seen by the users who has a role of Administration.

5.6.2 Product Management Menu

With the help of this menu, Administration, managers and stuff will be able to see all the product information by means of this section, they may edit, create, update all product information in other words manage some personal information which are updatable such as contact information, stuff information. This menu provides the option to suspend any product and keep the data. This menu will only be seen by the users who has a role of Administration, IT managers and stuff Admin.

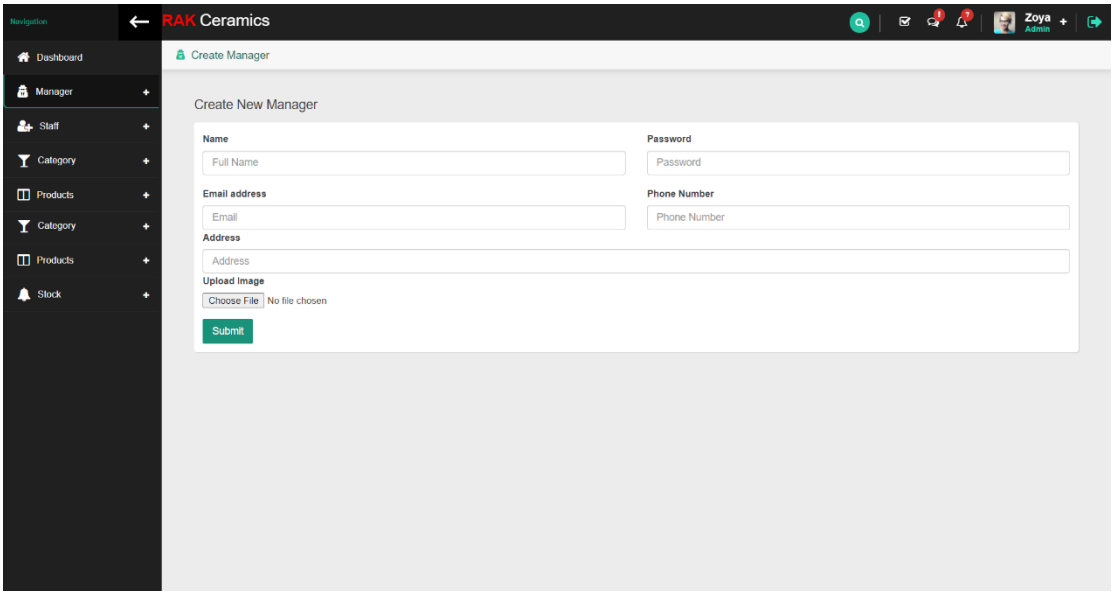

Figure 7 : Product Profile management menu

5.6.3 Stuff Management Menu

With the help of this menu, Administration, IT managers and HR and will be able to see all the product beneficial information such a. This menu provides the option to ask for product such as stuff product, H-product, H-rent, Bi-cycle rent, motorcycle product and also PF-product issue and etc. This menu also generates the report that consists all the product issues created by individual account. This menu can be seen by all the users that has a valid account in the software.

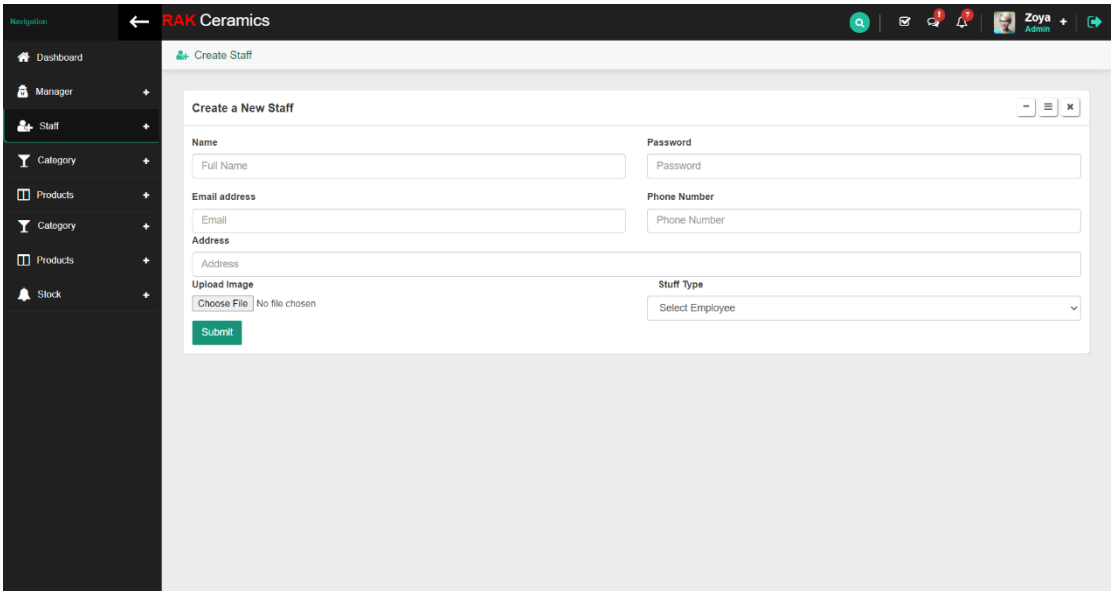

Figure 8 : Stuff management menu

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5.6.4 Product Menu

This is the menu where payroll and other options are available for each product individually. The only product user, has the option to only view all the information available, but Administrator, IT manager and HR has the access to modify all the options available.

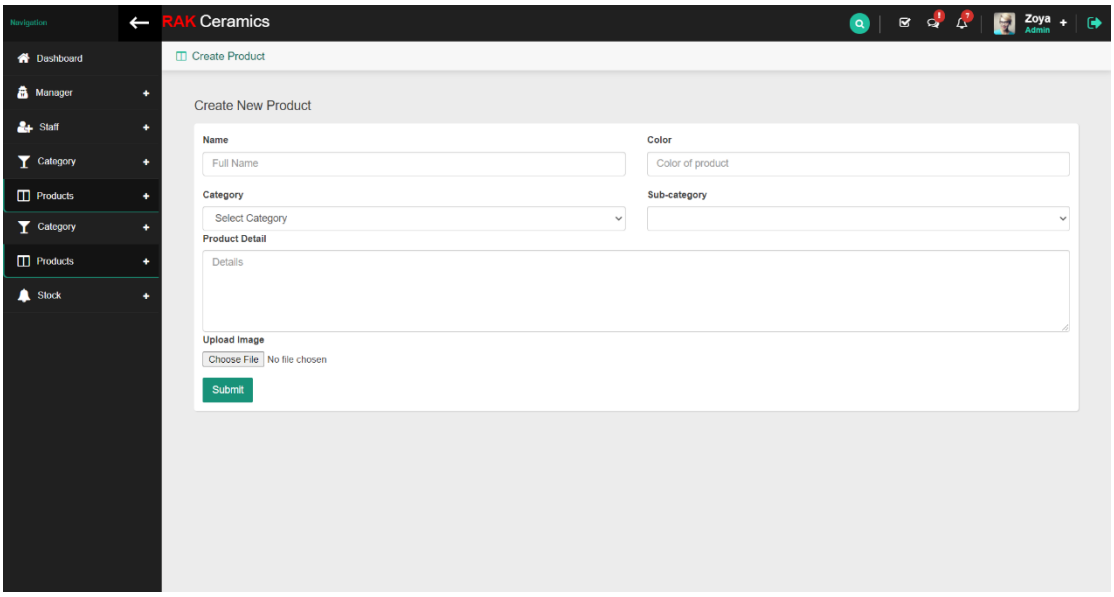


Figure 9: Product menu

5.6.5 Stuff Menu

This is the menu where product modules such as “Apply product” “Product history”, “Assign product” etc are available for each product individually. The HR and Product user, does not have the option to see approve or assign product, but Administrator, IT manager has the access to modify all the options available.

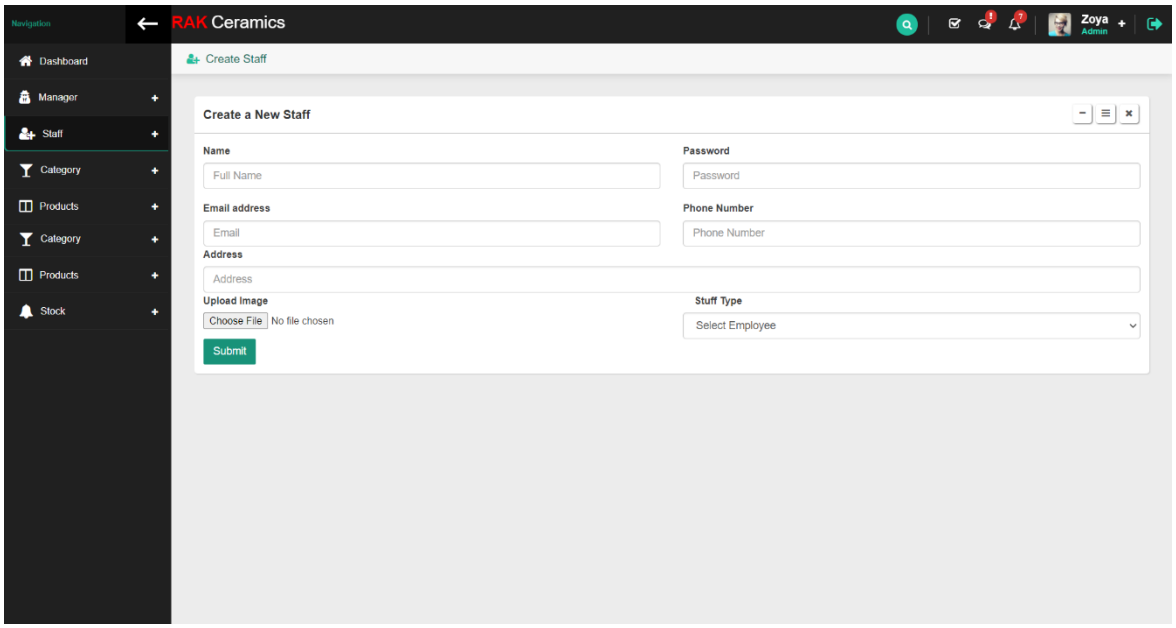


Figure 10 : Stuff Menu

5.6.6 Profile Menu

This is the menu where Applicants can apply for transfer and the application is submitted to the corresponding higher user. Products can see transfer status and IT Manager, Administrator can change and update information.

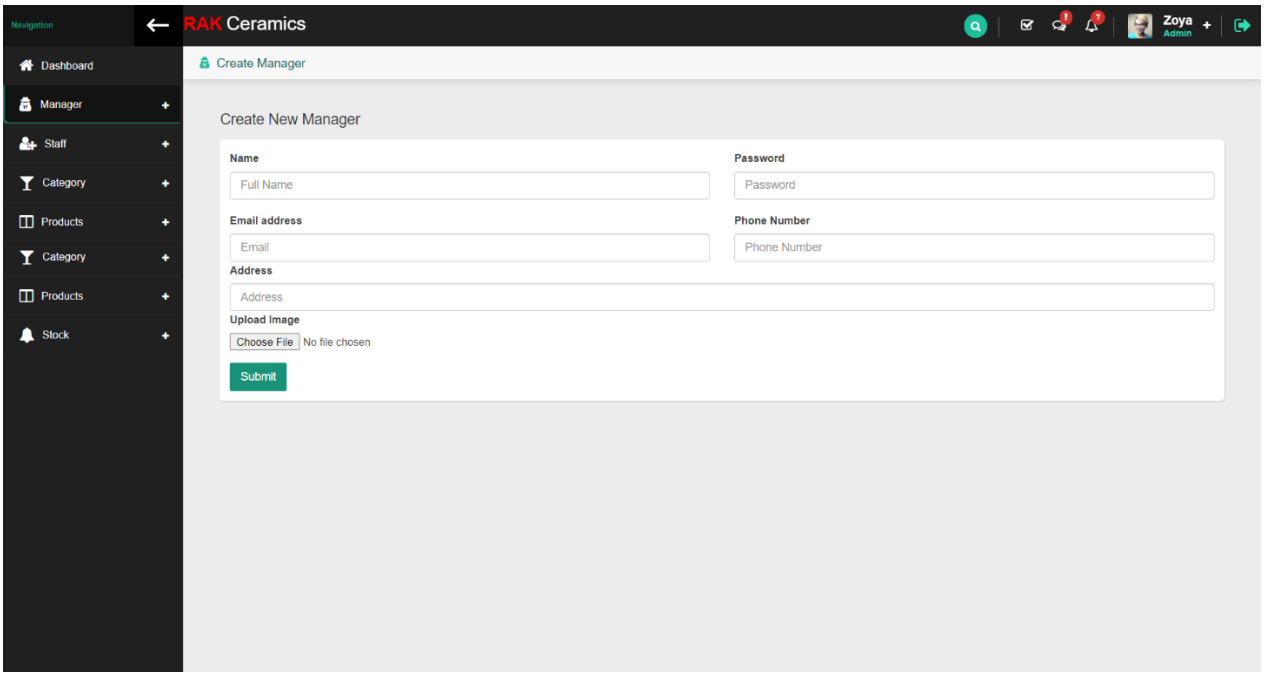


Figure 11 : Profile menu

5.6.7 Reports Menu

This menu contains all the report that is available to the corresponding user. The product user and HR only have the access to see their own information. But the Administrator and IT manager user has all the access to see any branch, Stuff or individual information of any user.

6.Requirement Specification

6.1 Hardware Requirements

- LAN/ DATA/WIFI Network
- Any smartphone/Laptop/Desktop

6.2 Software Requirement

- Operating System: Any with modern browser supporting html5, JavaScript
- PHP
- Laravel Frame-work
- Apache web server
- Common language runtime

6.3 Functional Requirements

A functional requirement is a function or feature that must be included in an information system in order to satisfy the business need and be acceptable to the users. A functional requirement defines what a website & its component are and what these components are supposed to accomplish. The following functional requirements were gathered with our decided requirements gathering methods. The inputs, processes and output are discussed below:

<table>
<tr><td colspan="3">Name of the Function: Must be compatible with all devices such as Computers, Smart phones, Tablets, Laptops etc.</td></tr>
<tr><td>Input:

1. N/A</td><td>Process:

1. System must be developed in a common development environment.</td><td>Output:

1. Web Application (System) will be accessible from every devices</td></tr>
<tr><td colspan="3">Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system</td></tr>
<tr><td colspan="3">Post condition: Everyone can use this Web application.</td></tr>
<tr><td colspan="3">Alternate Options: N/A</td></tr>
</table>

Name of the Function: Login to the system		
Input: 1. User Email 2. Password	**Process:** 1. Email and Password verification	**Output:** 1. Login successful. Able to access all the user privileges.
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and running internet connection. The ID, Password has to be correct.		
Post condition: Users can access as their pre-defined access point.		
Alternate Options: If the ID, Password is wrong show a command line that any one of them is wrong.		

Name of the Function: Add User (Administrator)		
Input: 1. Fill up all the necessary field provided	**Process:** 1. Validate all the inputs	**Output:** 1. User added successfully
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: Able to login as a specific user		
Alternate Options: if field is wrong, re-enter all information		

Name of the Function: View user list (Administrator, IT manager, Stuffs)		
Input: 1. Search all the user list providing necessary fields	**Process:** 1. Fetch all the data from database	**Output:** 1. All the user field is shown in the table down below
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: if search field is wrong, re-enter all info		

Name of the Function: Delete User (Admin, IT manager)		
Input: 1. Select any user from the table	**Process:** 1. Click the delete user button.	**Output:** 1. User deleted successfully
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection. And the table preloaded through search.		
Post condition: Can see the updated field once refreshed the page		
Alternate Options: N/A		

Name of the Function: Edit User info (Administrator, IT manager)		
Input: 1. Click the edit user button and re-type information	**Process:** 1. Validate all the inputs and update the database	**Output:** 1. User edited successfully
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection and has to put valid information.		
Post condition: Can see the updated information at the table.		
Alternate Options: if field is wrong, re-enter the information		

Name of the Function: Change Password (Administrator, IT Manager)		
Input: 1. Search through specific user through ID	**Process:** 1. Enter new password and confirm it	**Output:** 1. Password changed.
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: The user has to use new password to login		
Alternate Options: N/A		

Name of the Function: Delete Product (Administrator, Manager)		
Input: 1. Search through specific product code	**Process:** 1. Put specific event. 2. Select Effect Date. 3. Put Remarks(optional) 4. Apply	**Output:** 1. Product suspended.
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: Edit product (Administrator, IT manager)		
Input: 1. Search through product ID	**Process:** 1. Search through ID 2. Press Add Button 3. Edit fields accordingly	**Output:** 1. Product Updated
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: See Existing products (Administrator, IT manager, HR, Product)		
Input: 1. Search through product ID	**Process:** 1. Search through ID 2. Press Search Button	**Output:** 1. The table appears downwards

Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.
Post condition: N/A
Alternate Options: N/A

Name of the Function: Product transfer (Administrator, IT manager)		
Input: 1. Search through product ID	**Process:** 1. Search through ID 2. Choose reporting Month 3. Press search	**Output:** 1. Product transferred
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: See stuff info (Administrator, IT manager,Stuff)		
Input: 1. Search through product ID	**Process:** 1. Search through ID 2. Press search 3. Data is fetched from Database	**Output:** 1. The table appears downwards.
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: Modify stuff(Administrator, IT manager)		
Input: 1. Search through product ID	**Process:** 1. Search through ID 2. Press Search Button 3. Confirm product identity 4. Edit existing fields	**Output:** 1. Information Updated
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: Save product (Administrator, IT manager, IT, Stuff)		
Input: 1. Press Apply product menu	**Process:** 1. If logged in, user is detected automatically. 2. Select product type 3. Select Date 4. Type reason 5. Press apply button	**Output:** 1. Product Application sent.
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: ADD product (Administrator, IT manage)		
Input: 1. Press pending for approval menu	**Process:** 1. Approve product request	**Output:** 1. Approved
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: If not approved the application is removed and notified the user.		

Name of the Function: Delete (Administrator, IT manager)		
Input: 1. Press delete process	**Process:** 1. Select specific product ID 2. Select existing requests 3. Submit	**Output:** 1. Approved
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: Check reports (Administrator, IT manager)		
Input: 1. Go to reports menu	**Process:** 1. Select specific report 2. Select area or Stuff accordingly	**Output:** 1. Table appears from the database with information

	3. Check report or Export to EXEL sheet.	
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

Name of the Function: Logout (Administrator, IT manager, Product)		
Input: 1. Press logout button	**Process:** 1. The user is logged out	**Output:** 1. Redirected to the login page
Precondition: User must have a Computer, Laptop, tablet or smart phone which has ability to run the system and a working internet connection.		
Post condition: N/A		
Alternate Options: N/A		

6.4 Non-Functional Requirements

Non-Functional Requirements specifies the quality attribute of a software system. They judge the software system based on Responsiveness, Usability, Security, Portability and other non-functional standards that are critical to the success of the software system. Example of nonfunctional requirement, "how fast does the website load?" Failing to meet non-functional requirements can result in systems that fail to satisfy user needs.

Non-functional Requirements allows to impose constraints or restrictions on the design of the system across the various agile backlogs.

Performance: Performance requirements represent the performance of the system is required to exhibit to meet the needs of products. Performance describes the acceptable throughput rate & acceptable response time. This website should be the site providing all information about the attendance of a company. The main reason to build this website is to manage all the information they handled manually.

Information: Information requirements represent the information that is pertinent to the users in terms of content, timeliness, accuracy and format. Information is about the necessary inputs and outputs and how it will be managed, types of the required data to be stored, how currently the information will be saved in to the system, how the interfaces of external systems will work etc.

Security: Security Requirements: Security and administration is always a concern for any system. All information on the main website is secured. Only website administrator has access to the dashboard to control the main website features. In this project, Dot net framework (C# based) has been used as backend, which have various layers of security, where security requirements for this system have been taken care of. Control requirements represent the environment in which the system must operate, as well as the type and degree of security that must be provided. Access to the system or information must be controlled with the privacy requirements.

Efficiency: Efficiency requirements represent the system's ability to produce outputs with minimal waste. We have tried to eliminate duplicate steps in the processes and to use the resources in an efficient way.

Responsiveness: The has to be responsive to all the devices so that it can be accessed by any kind of devices.

Extensibility and Maintainability: There is one standard template used for one look and feel throughout the site. The website can be expanded to accommodate many further modules without making any changes to any existing modules. The web application is created in such a way that the administrator can easily maintain both at a server and client sides.

Service: Service requirements represent needs in order to make the system reliable, flexible and expandable. It is concern about who will use the system and where are they will be located, how many types of users will be in this system? The appropriate human factors, what training devices and training materials will be included in the system.

7. Development Phase

7.1 Methodology

In software engineering, a software development process is the process of dividing software development work into distinct phases to improve design, product management and project management. It is also known as a software development life cycle (SDLC). We can define SDLC as a framework that describes the activities performed at each stage of a System Development Project. So, it has some basic stages to be followed during development phase.

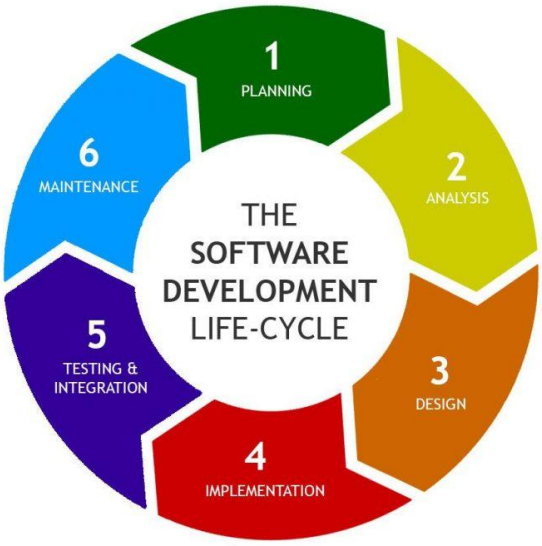


Figure 12: SDLC

1. **Planning**

Business prerequisites are acknowledged in this phase.

Meetings with supervisors, partners and customers are held to decide the prerequisites like:

- Who is going to use the software application?
- How is the software application going to be used?
- What information is the software going to process?

These are general inquiries that get replied during the prerequisite's acknowledgment stage.

A Requirement Specification document is then created to serve the purpose of guideline for the next phase of the cycle. It usually consists of the following:

- Functional Requirement Specification
- Client/Customer Requirement Specification

- User Requirement Specification
- Process Design Document
- Process Document

2. Requirement analysis

The stage of requirements analysis is the most important in SDLC. It is usually performed by the senior members of the software development team along with marketing and industry experts. This is the crucial part of the project where the software development team leadership must understand the essence of the software to be developed, the specifics of the business case and the potential positioning of the software being developed against the products of competitors, (assuming they exist in the market).

The outcome of this stage, usually, is the SRS document, which stands for Software Requirements Specification.

At this stage, the identification of the development risks as well as the quality assurance methodology baseline is decided upon.

The outcome of the analysis stage is to define the technical solutions which will lead to the success of the project with minimum risk.

2. Design

In our simplified model, we assume that after Stage 1, the requirements analysis, the leader of the project writes down the decisions that were taken and develops the so-called Software Requirement Specification (SRS) document. The SRS is the reference guide for the software architects to deliver the best possible result for the given software.

The outcome of the work of the software architect(s) is the System Design Specification (SDS). This document sometimes is also called the Design Document Specification (DDS). The best scenario is that the SDS is reviewed by the important stakeholders of the project from different outlooks, such as: risk assessment, product robustness, design modularity, budget and time constraints. The best design model is then discussed and selected for the product.

The design of the software clearly outlines the architectural modules of the product as well as data flow and communication diagrams within the product itself, in addition, it specifies any third-party integration that is relevant to the product.

3. Implementation

The complexity of this stage heavily depends on the outcome of the previous two stages. The better the SRS and SDS, the easier it is for the software engineers to develop the required software modules. It is no secret that if the first prototypes/versions of the software are required within a very short timescale, then this can adversely affect the quality of the final software. Quality also depends heavily on the analysis capabilities of each individual taking part in the coding process, as does having a properly prepared SRS and SDS.

The more experience and brain-power the analysts, architects and developers have, the less time and documentation is needed in the design phase.

4. Testing and Integration

Although this stage is called testing, in real life, the situation is that faults found in the software in the testing phase, lead back to the development phase and then back to the testing phase in circles, until the software finally reaches the necessary quality. The testing phase normally consists of two internal phases:

- Automated unit/functional tests
- Acceptance tests performed by a human

5. Maintenance

Ignoring the technical side of this phase, this is when the software is released to the alpha/beta or stable state and feedback starts to come in. Analysis of the feedback can then lead to second third or fourth iterations of the SDLC which means, the process is continued again with phases 1, 2, 3, 4 and 5, gradually eliminating any issues that have been found in the released software.

The whole software development process can be also be planned over several iterations, especially, when it comes to Agile, where the main focus is to release a working product as soon as possible and implement different features later on.

So, it doesn't mean that going over several iterations always means bug-fixing or tuning. As I just mentioned – it can also be a pre-planned process.

SDLC models

There are quite a few software development life-cycle models out there that you can follow and use. Each model follows a series of unique steps, with the ultimate aim of ensuring the success of the software development.

Here are some of the most popular SDLC models in industry:

- Waterfall
- Agile
- Iterative
- Spiral
- Rapid Application Development
- Prototyping

The SDLC that is being to develop this software is AGILE method.

The **Agile software development** methodology is one of the simplest and effective processes to turn a vision for a business need into software solutions. Agile is a term used to describe software development approaches that employ continual planning, learning, improvement, team collaboration, evolutionary development, and early delivery. It encourages flexible responses to change.

The agile software development emphasizes on four core values.

1. Individual and team interactions over processes and tools
2. Working software over comprehensive documentation
3. Customer collaboration over contract negotiation
4. Responding to change over following a plan

Since the software is still in development phase, the functions are being constantly updated.

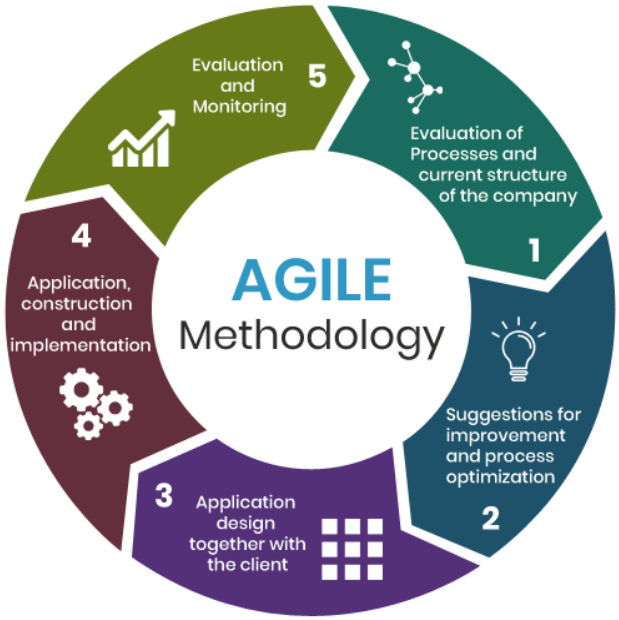


Figure 13: Agile Method

8. Designing

8.1 High Level Design

High-level design (HLD) explains the architecture that would be used for developing a software product. The architecture diagram provides an overview of an entire system, identify the main components that would be developed for the product and their interfaces. HLD decomposes a system into modules and represents the interfaces & invocation relationships the modules. So, HLD represents the software architecture of a system. We have represented the Work Breakdown Structure (WBS) and the software architecture and data flow diagram as the HLD of this attendance management subsystem.

Architecture of the System: Software architecture is the defining and structuring of a solution that meets technical and operational requirements. Software architecture optimizes attributes involving a series of decisions, such as security, performance and manageability. It describes the organization and interaction of software components. There are many types of architectures that are used among them we are using the client server architecture for this IMS.

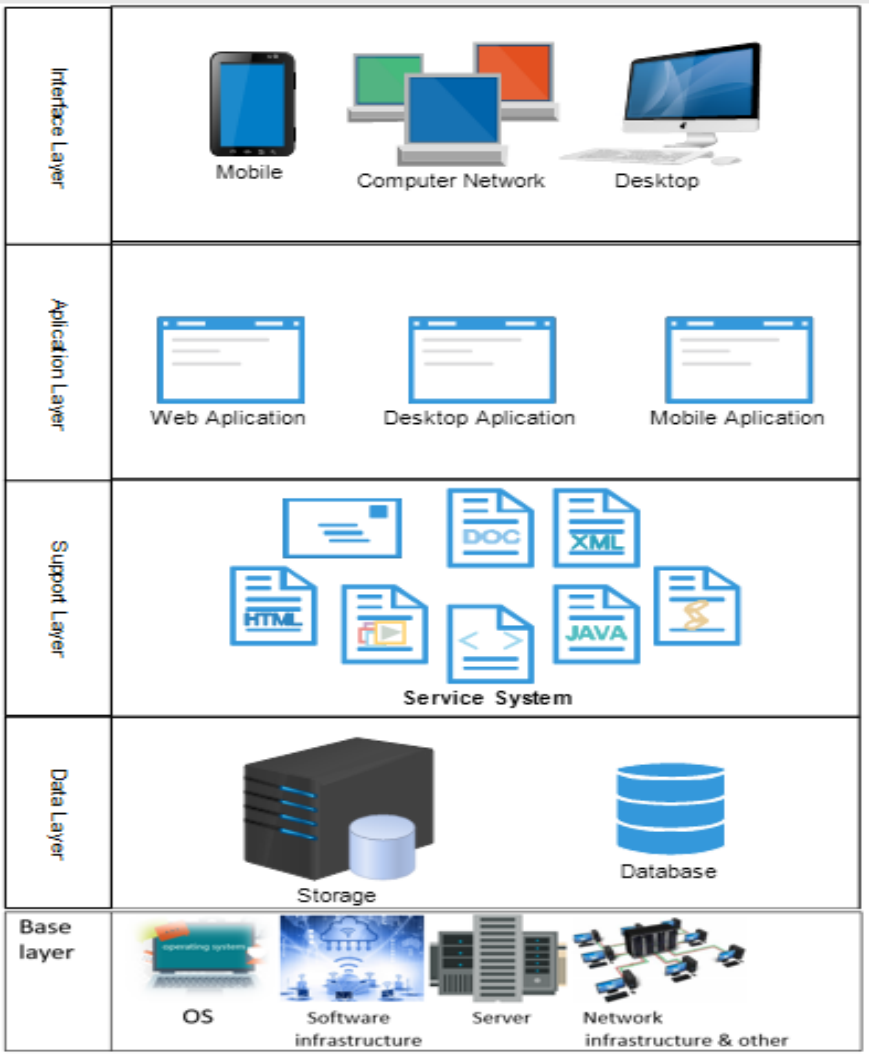


Figure 14: Software Architecture

Client server architecture is one kind of distributed system architecture. Distributed systems are where the system or software runs on a loosely integrated group of cooperating processors linked by a network. It means set of separate computers that are capable of autonomous operation, linked by a computer network. Client server architecture is the application that is modelled as a set of services that are provided by servers and a set of clients that use these services. Client-server architecture, is architecture of a computer network in which many clients (remote processors) request and receive service from a centralized server (host computer). Client computers provide an interface to allow a computer user to request services of the server and to display the results the server returns. Servers wait for requests to arrive from clients and then respond to them.

Data Flow Diagram (DFD): Data Flow Diagram (DFD) provides a visual representation of how information flow within a system. With DFD, you can identify the information provided by and output to certain entity or sub-process within a specific system/process scope, the kind and form of information needed in order to complete the process.

For this IMS, we made a data flow diagram. Diagram shows how data flow from one actor to another and how data interact with database.

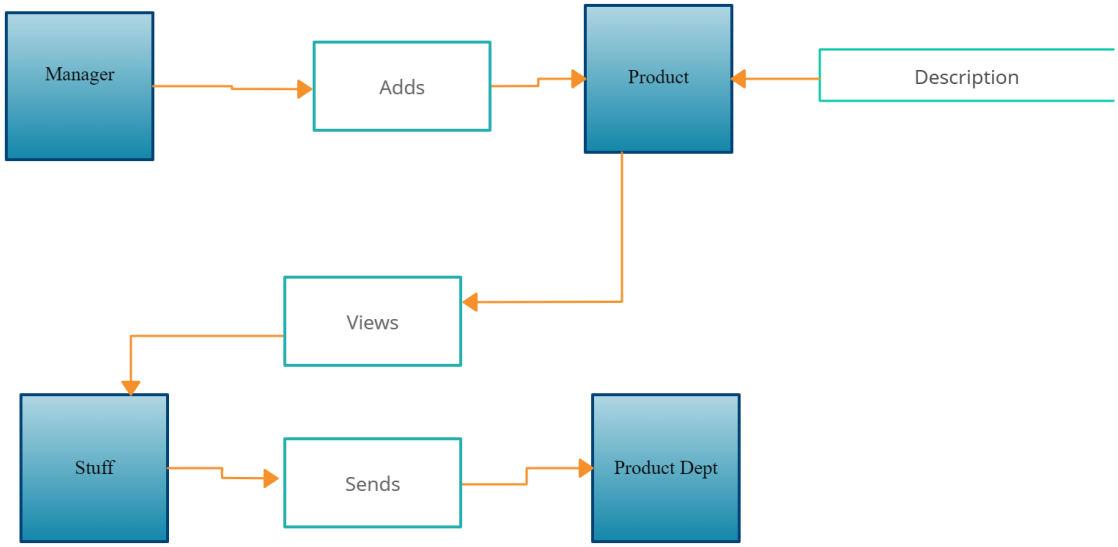


Figure 15: Data Flow Diagram

8.2 Low Level Design

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Low Level Design (LLD) is mainly detailing the HLD. It defines the actual logic for each and every component of the system. To represent LLD we can use some diagrams for this system according to the requirements and also, we can use any of Unified Modeling Language (UML). So, for this particular IMS subsystem we are using Entity Relationship Diagram, Use Case Diagram and Rich Picture activity diagram.

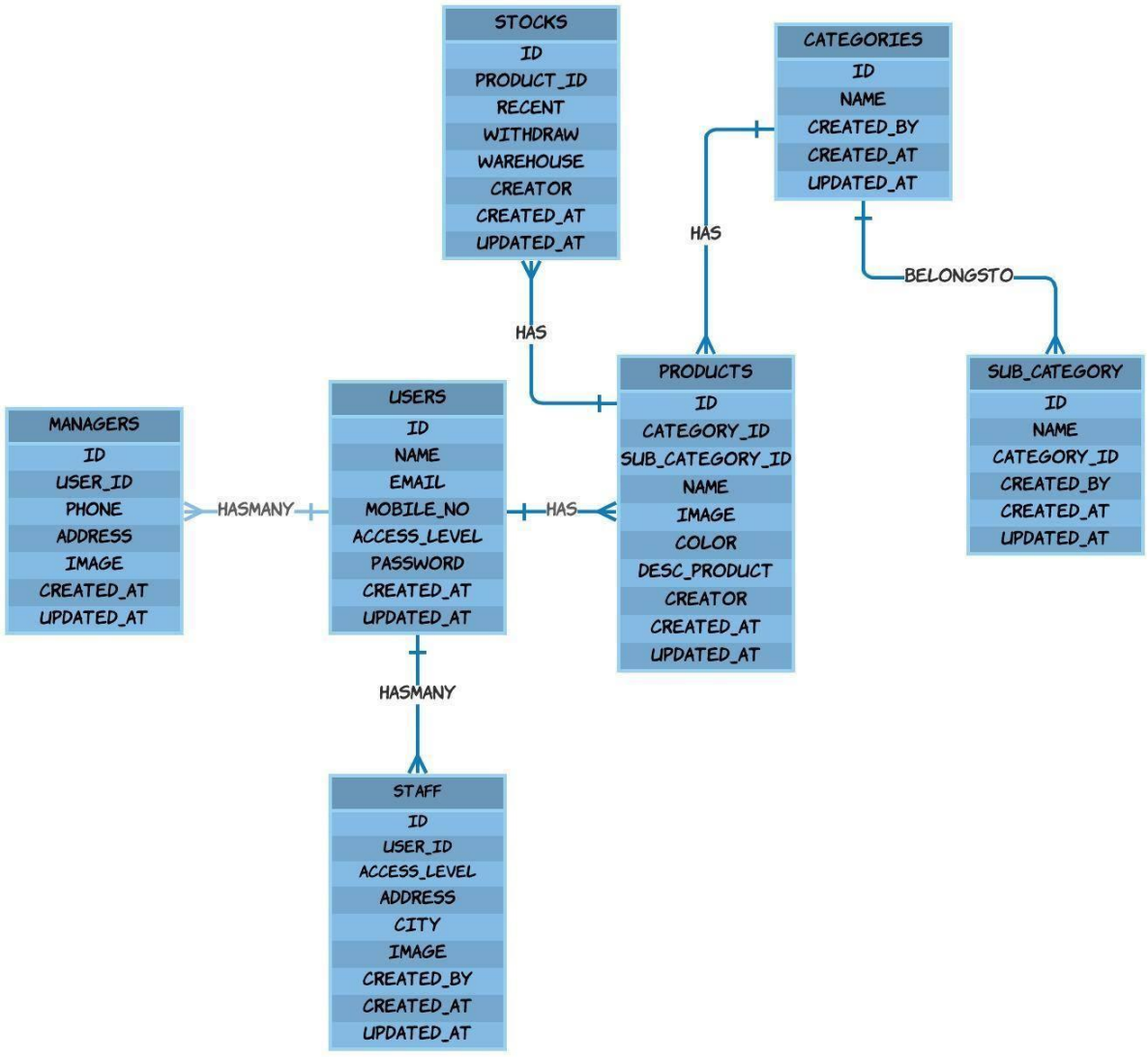


Figure 16: ER diagram of the IMS

8.2.2 Use case diagram

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses.

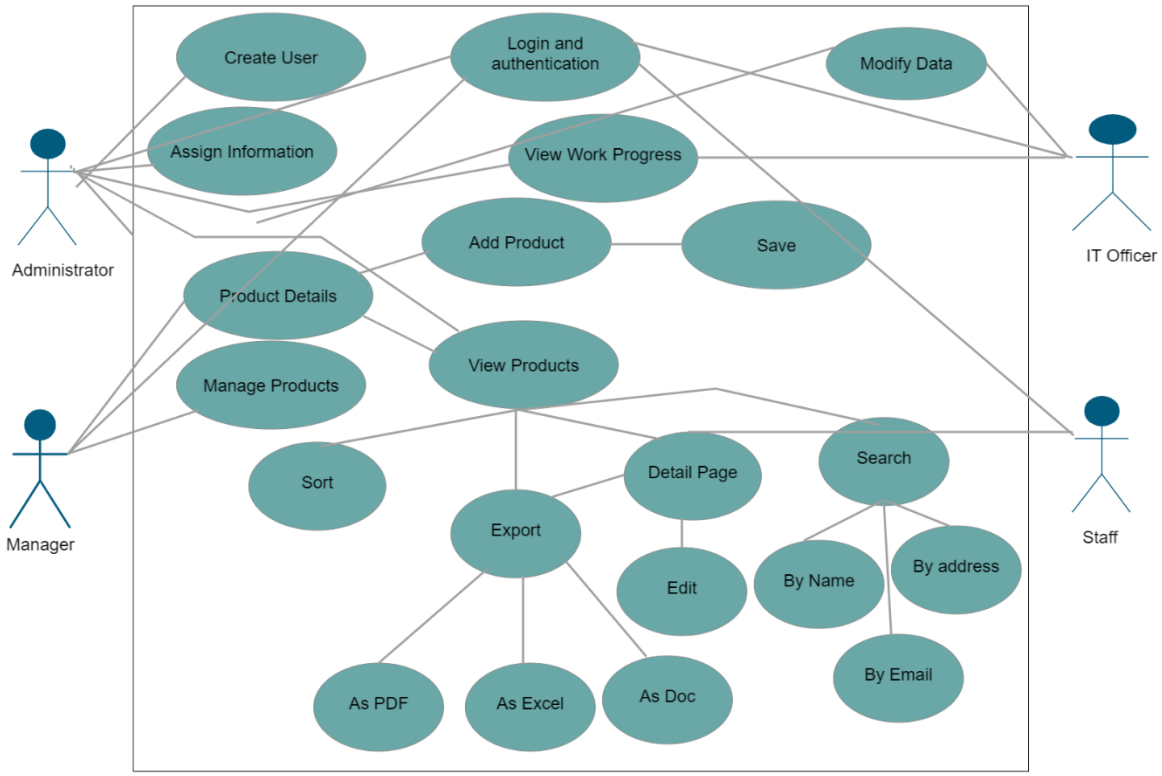


Figure 17: Detailed Use Case Diagram

8.2.3 Activity Diagram:

Activity diagram is another important behavioral diagram in UML diagram to describe dynamic aspects of the system. Activity diagram is essentially an advanced version of flow chart that modeling the flow from one activity to another activity.

Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. Typically, an event needs to be achieved by some operations, particularly where the operation is intended to achieve a number of different things that require coordination, or how the events in a single use case relate to one another, in particular, use cases where activities may overlap and require coordination. It is also suitable for modeling how a collection of use cases coordinates to represent business workflows

1. Identify candidate use cases, through the examination of business workflows
2. Identify pre- and post-conditions (the context) for use cases
3. Model workflows between/within use cases
4. Model complex workflows in operations on object

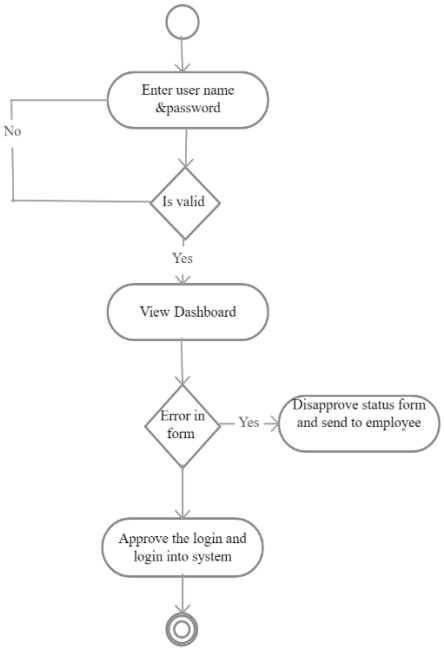


Figure 18: Activity Diagram of login attempt

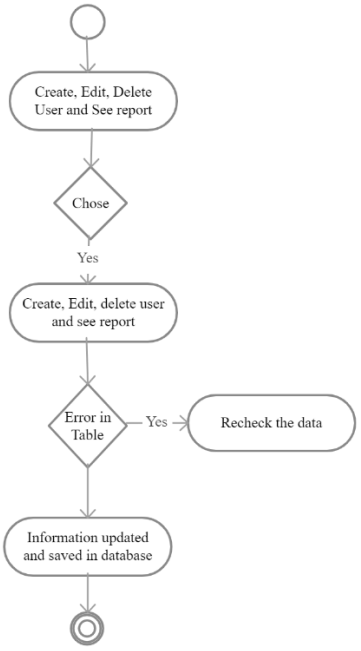


Figure 19: Activity diagram of Administrator

Implementation

The software implementation stage involves the transformation of the software technical data package (TDP) into one or more fabricated, integrated, and tested software configuration items that are ready for software acceptance testing.

Software implementation of the framework for the template-based modelling includes several libraries, which provide building blocks for the templates. Such functionalities are authentication, routing, sessions, and caching. Asp. Net aims to make the development process a pleasing one for the developer without sacrificing application functionality. After setup the Visual studio in the pc, at first a new project was created using command like this: “RAK Ceramics IMS”. After creating the project, we have run the server and started other things to implement.

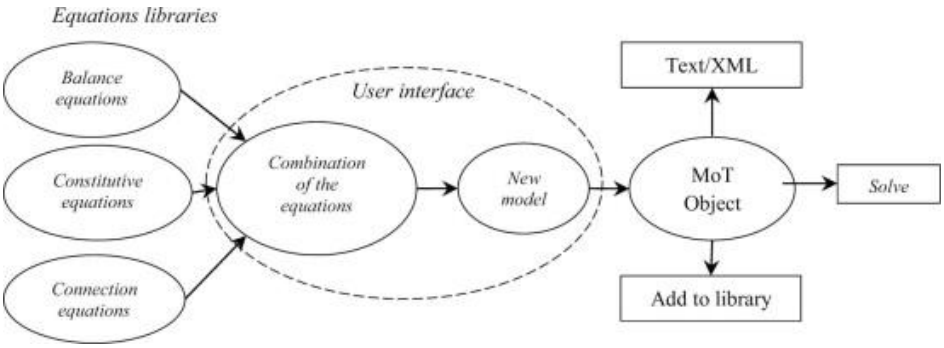


Figure 20: Implementation template

The design and layout should follow the company logo. And the design can be anything. But easy to read.

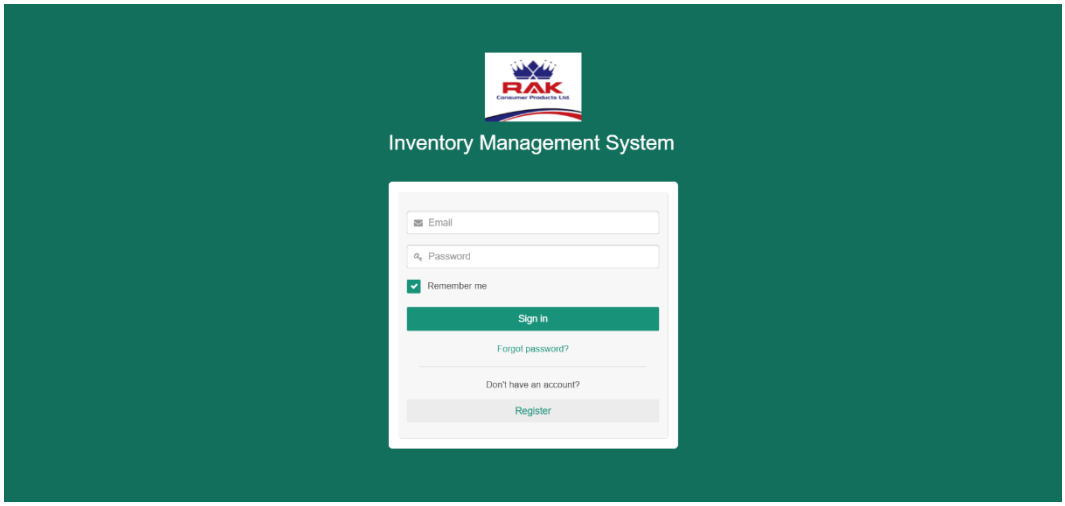


Figure 21: Design layout

10. Testing

A test case is a document, which has a set of test data, preconditions, expected results and postconditions, developed for a particular test scenario in order to verify compliance against a specific requirement.

Test Case acts as the starting point for the test execution, and after applying a set of input values, the application has a definitive outcome and products the system at some end point or also known as execution postcondition.

Typical Test Case Parameters:

- Test Case ID
- Test Scenario
- Test Case Description
- Test Steps
- Prerequisite
- Test Data
- Expected Result
- Test Parameters
- Actual Result
- Environment Information
- Comments

We will write the test for the following reasons:

- To require consistency in the test case execution
- To make sure a better test coverage
- It depends on the process rather than on a person
- To avoid training for every new test engineer on the product

To require consistency in the test case execution: we will see the test case and start testing the application.

To make sure a better test coverage: for this, we should cover all possible scenarios and document it, so that we need not remember all the scenarios again and again.

It depends on the process rather than on a person: A test engineer has tested an application during the first release, second release, and left the company at the time of third release. As the test engineer

understood a module and tested the application thoroughly by deriving many values. If the person is not there for the third release, it becomes difficult for the new person. Hence all the derived values are documented so that it can be used in the future.

To avoid giving training for every new test engineer on the product: When the test engineer products, he/she products with a lot of knowledge and scenarios. Those scenarios should be documented so that the new test engineer can test with the given scenarios and also can write the new scenarios.

10.2 Test Case Analysis

10.2.1 Testing Synopsis

Items to Be Tested Items:

All the features which are discuss in the functional requirement will be tested. According to the detail features, description, constraints of the website below functionalities will be scope of the testing-

Admin Module:

- Create Account
- Delete Account
- Change Password
- Add Product

Product Profile Management Module:

- Edit Product Information
- Change Details
- Delete

Stuff Management Module:

- Product Transfer
- Reports
    - Product Balance Status
    - Fund & Product Status

Product Module:

- Add product
- Pending for Approval
- Approve product
- Product History

Transfer Module:

- Approval Process

Reports Module:

- Product Slip
- Stuff Sheet
- Product Status
- Product All info
- Bonus Report
- Product Schedule

Items Not to Be Tested:

- Report module
- Forgot password

Test Environment / System Requirements

ID # Hardware Component Requirements HC-1 Computer/ Laptop/ Smart Phone 1 GB RAM minimum

SC-2

- Operating System Version (IOS, Windows)
- Any SC-3 Windows/ Linux/ Mac OS Any
- Database
- C#

10.3 Test Result

No	Test Case Name	Purpose	Precondition	Test Steps to	Expected Result	Actual Result	Status	Remarks
1	Login	Check if the User Login is Successfully done.	i)User must have internet connection ii)User must provide login credentials	i)Validate the user inputs such as Login Id, user type, password etc. ii)User must click login button	i) If User input correctly website show "user Login successfully done" ii)Otherwise show error massage.	i) App show "user Login successfully done"	Pass	No remarks
2	Add Product	To make sure that product add function works.	i) only admin can do this function ii)must login to the system	i) give product information ii)select supervisor iii)select Stuff iv) click add button	i)if all information given correctly admin can see "Product added successful" message	i) Admin can see the successful message	Pass	No remarks
3	View Products	To make sure that admin and supervisor can view product list	i) Connect to the internet ii) Visit to website iii)login to the system	i) click view product list button	i) If all okay admin and supervisor can see product list in a table ii)if error and error message appear	i)Admin and supervisor view the product list	Pass	No remarks

4	Edit Product	To make sure that edit product function working correctly	i) Connect to the internet ii) login to the system iii)user must be admin	i) provide updated information ii) click update button	i) if success admin can see updated product information ii)if error and popup will shown	i) admin see updated product informati on	Pass	No remarks
5	Delete Product	To make sure that delete product function working correctly	i) Connect to the internet ii) login to the system iii)user must be admin	i) provide updated information ii) click delete button	i) if success admin can see deleted product information ii)if error and popup will shown	i) admin see deleted popup	Pass	No remarks
6	Add Stuff	To make sure that Stuff add function works.	i)only admin can do this function ii)must login to the system	i) give Stuff information ii) click add button	i)if all information given correctly admin can see "Stuff added successful" message	i) Admin can see the successful message	Pass	No remarks
7	View Stuff	To make sure that admin can view Stuff list	i) Connect to the internet ii) Visit to website iii)login to the system	i) click view Stuff list button	i) If all okay admin can see Stuff list ii)if error and error message appear	i)Admin view the Stuff list	Pass	NO remarks
8	Edit Stuff	To make sure that edit Stuff function working correctly	i) Connect to the interne ii) login to the system iii)user must be admin	i) provide updated information ii) click update button	i) if success admin can see updated Stuff information ii)if error and popup will shown	i) admin see updated Stuff informati on	Pass	No remarks

9	Change Password	To make sure that password change working correctly	i) Connect to the internet ii) admin and supervisor can performed this function	i) click forgot password button ii) give new password iii) click change password button	i) if everything correct user can see message "password change successfully" ii) if error user can see an error popup	i) user see "password change successfully" message	Pass	No remarks
10	Report generation	To make sure that attendance report generate function working correctly	i)Admin can do this function ii)Admin must be login first	i)select which report want to generate daily/monthly/yearly ii) click generate report button	i) if success a xml format report will download ii)if error admin can see and error message	i) report download successfully	Pass	No remarks
11	View Product list	To make sure that view chart function working correctly	i)Admin can do this function ii)Admin must be login first	i) admin can see different type of analytical chart ii)click view chart button	i) if success admin can view the chart ii)if error admin can see and error message	i) view chart showing successfully	Pass	No Remarks
12	Add Product	To make sure that Product function working correctly	i)All user can do this function ii)User must be login first	i) User can select products as they need ii)Click apply Button	i) if success user can see all product info ii)if error admin can see and user message	i) Product Applied successfully	Pass	No remarks
14	Product issues	To make sure that PF product issues	i)Admin and IT manager user can do	i) User can update and edit ii)Click save Button	i) if success user can edit and update products	i) Product Info Updated	Pass	No remarks

		function working correctly	this function		ii)if error user can see and error message			
15	Advance product Status	To make sure that Advance product transfer function working correctly	i)Admin and IT manager user can do this function	i) User can update and edit ii)Click save Button	i) if success user can edit and update products ii)if error user can see and error message	i) Product Info Updated	Pass	No remarks
16	Product status	To make sure that Product Balance function working correctly	i)Admin and IT manager user can do this function	i) User can update and edit ii)Click save Button	i) if success user can edit and update products ii)if error user can see and error message	i) Product Info Updated	Pass	No Remarks
17	Stuff and Product status	To make sure that Fund and Product function working correctly	i)Admin and IT manager user can do this function	i) User can update and edit ii)Click save Button	i) if success user can edit and update products ii)if error user can see and error message	i) Product Info Updated	Pass	No Remarks
18	Modify Stuff	To make sure that Modify function working correctly	i)Admin and IT manager user can do this function	i) User can update and edit ii)Click save Button	i) if success user can edit and update stuff ii)if error user can see and error message	i) Stuff Info Updated	Pass	No remarks
19	Modify Category	To make sure that Modify function working correctly	i)Admin and IT manager user can do this function	i) User can update and edit ii)Click save Button	i) if success user can edit and update stuff ii)if error user can see and error message	i) Stuff Info Updated	Pass	No remarks
20	Product Category	To make sure that Modify	i)Admin and IT manager	i) User can update and edit	i) if success user can edit	i) Bonus Info Updated	Pass	No remarks

		function working correctly	user can do this function	ii)Click save Button	and update bonus ii)if error user can see and error message			
22	Approve product	To make sure that Approve function working correctly	i)Admin and IT manager user can do this function	i) User can Approve product application ii)Click Approve or disapprove Button	i) if success user can approve and disapprove ii)if error user can see and error message	i) Approved or disapprove Successfully	Pass	No remarks
23	Product History	To make sure that History function working correctly	i)All user can do this function	i) User can See product history ii)Click see Button	i) if success user can see product history ii)if error user can see and error message	i) Product history appears in a table	Pass	No remarks
24	Reports	To make sure that All the report function working correctly	i)User can access different modules as per their access	i) User can See and download reports accordingly ii)Click search Button	i) if success user can see and download reports as they need ii)if error user can see and error message	i) Report appears in a table or gets downloaded as XML file	Pass	No remarks

10.3 Test Result

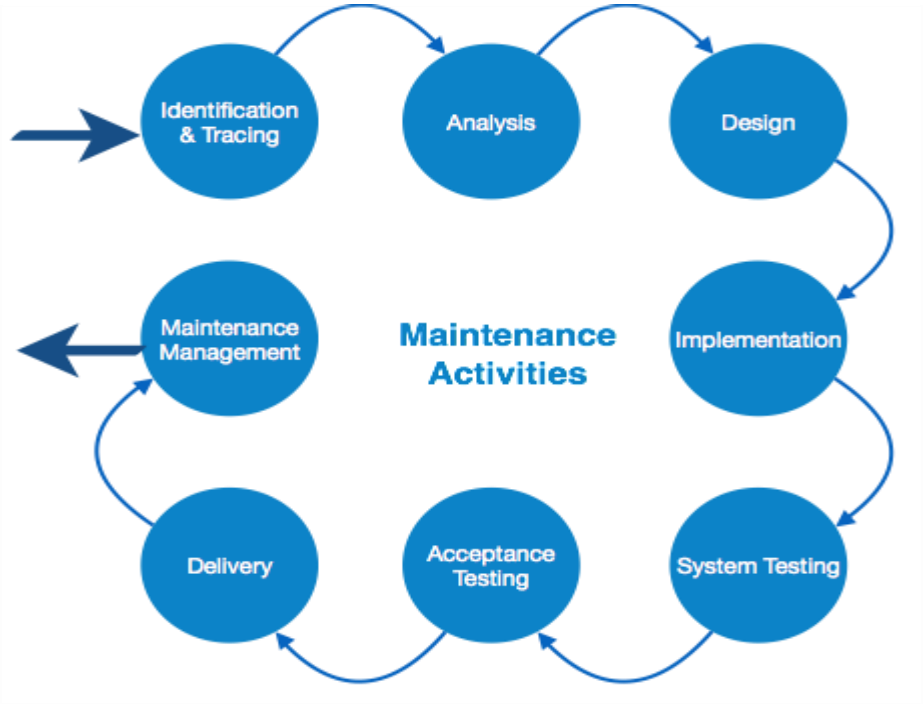
Some functionality did not show correct result, some is still in development phase. Developer is still working on fixing it and give it to test again. After final testing from the development sides the software is given to the company for user acceptance test. Company's representative tests the software and provide their feedback. According their feedback action is taken and produce a final deliverable product.

Once the process of testing is completed, the testing team prepares various documents that help communicate the simple and complicated activities, processes, methodologies, etc., related to the process of testing, to the other members as well as the stakeholders of the project. Test summary report is one such document prepared by the team, which offers critical details about the testing cycle as well as the status of the test result.

11. Deployment and maintenance

After testing of this IMS, it is ready to deployment the system. Now the company server will host the software. We need some space to upload this website. These hosting space will also use for website data store. The internal domain will be used to access it. Here we choose .com. currently, this website is live to show the demo for my Internship Defense but we are still developing some of features. As soon as possible it will be uploaded and the website will be updated. After deployment of IMS we will continue to make improvements and changes according to user's requirements.

After deployment we make a contact that we will give minor support upcoming 6 months. After that we will charge for some maintain cost for the update, changes and failure.



12. Conclusion & Recommendation

12.1 Conclusion

During these three months I worked on a development of a IMS for RAK Ceramics Bangladesh. This website was a solution for manual system of the RAK Ceramics products' IM. In previous offline software, maintaining all the processes manually is very difficult. With the Internet connection, user can take products, management of products in every product's information using this system. This system will more user friendly then before so that user can easily use it. In the website, you have to select your option and do the whole process just clicking the buttons and then you are done. System will automatically run whatever process was selected per the user.

It has been a great opportunity for me to work as a software developer and IT support intern during internship at the reputed company RAK Ceramics Bangladesh. This three-month internship program was like a step stone to my carrier in the job market. During internship I learned many important knowledges about IT sector. The internship program helped me to gain important knowledge about how the IT sector shaping in our country and also microfinance. Internship at RAK Ceramics Bangladesh has taught me how to handle different stakeholders, recent software related technologies, frequently used technologies and best used of this technology. This program gave me a clear idea about professional life as a software programmer, what I must face and how to handle those situations. I also learned corporate culture of a well-established company like this one.

12.2 Recommendation

This is a very complicated and well documented project, so before using this system user should able to understand some basic things that needed for using this system. This will help to use this system use easier and interactive. So, some recommendations are listed below:

- This is online project. Before using this system, user should understand using internet.
- User should able to know using browsers
- Before use this system, user should check their device internet connections
- User should able to know how to login to the system
- User doesn't have to be a software experienced person but should have some knowledge about software and how to use it.

12.3 Future Plan

The project has a very vast scope in future. The project will have more functionality in coming days since the company is working on another microfinance system software and the can merge together. Project can be updated in near future as and when requirement for the same arises, as it is very flexible in terms of expansion. With the proposed software of database space ready and fully functional the client is now able to manage and hence run the entire work in a much better, accurate and error free manner. This project can be extended and in future it can also be includes:

- Needs to work on the design
- Needs to work on the dashboard
- All reports need to be functional
- Mobile & IOS application

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UI Screenshots

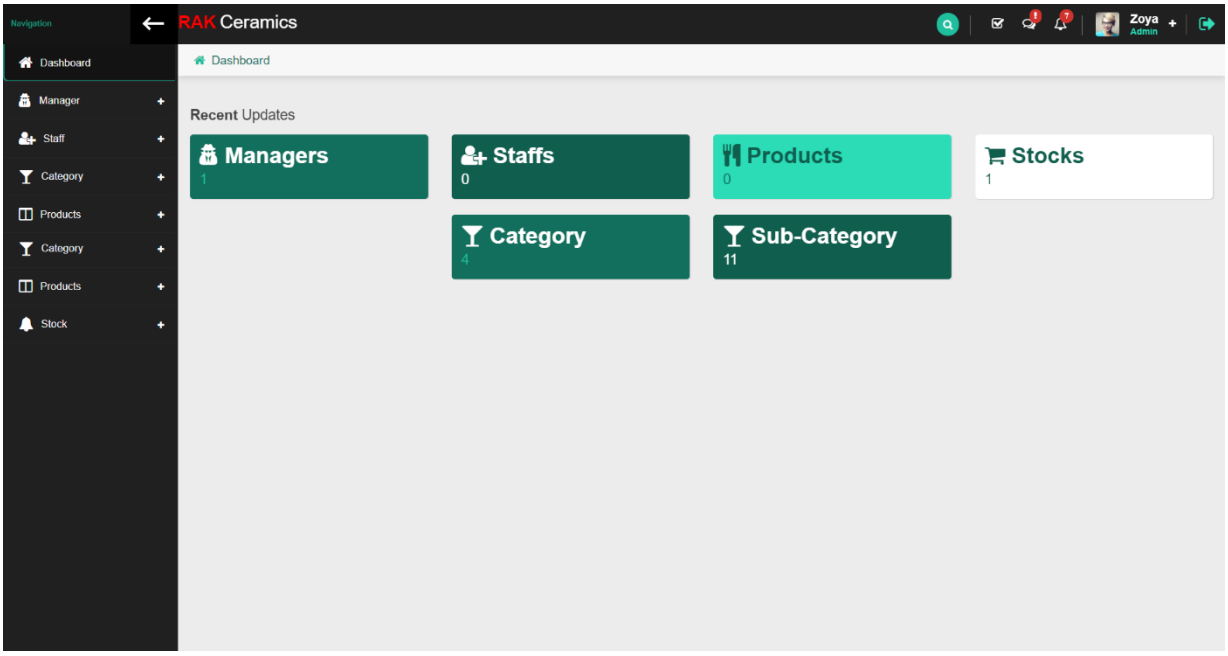

Figure 22: UI- Dashboard

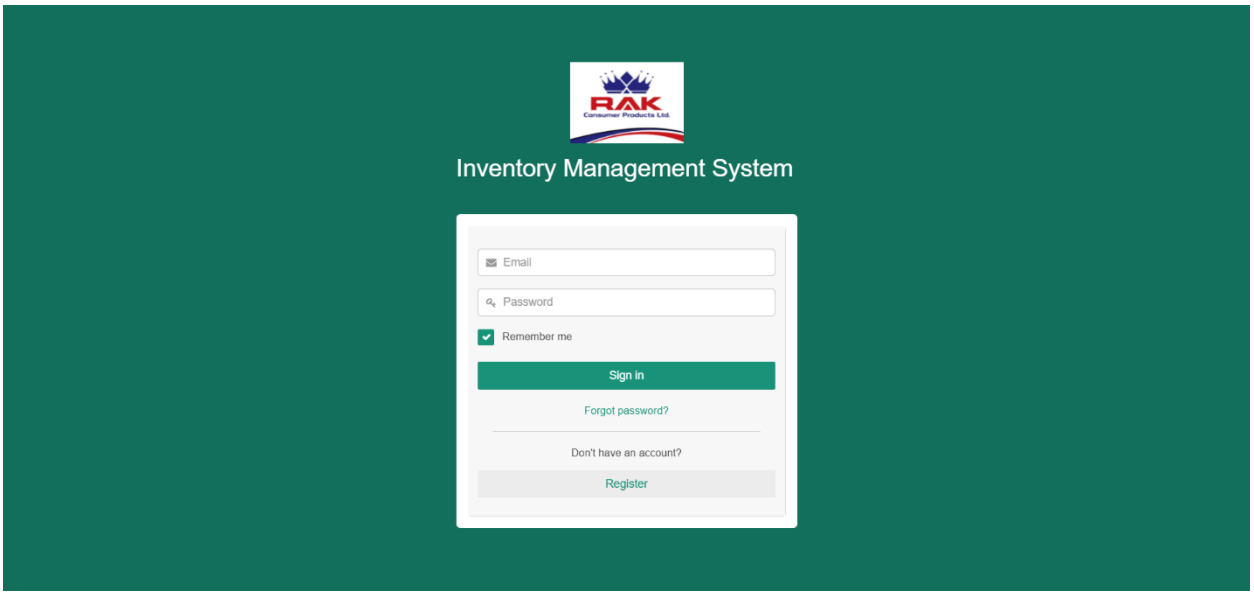

Figure 23: UI- Login

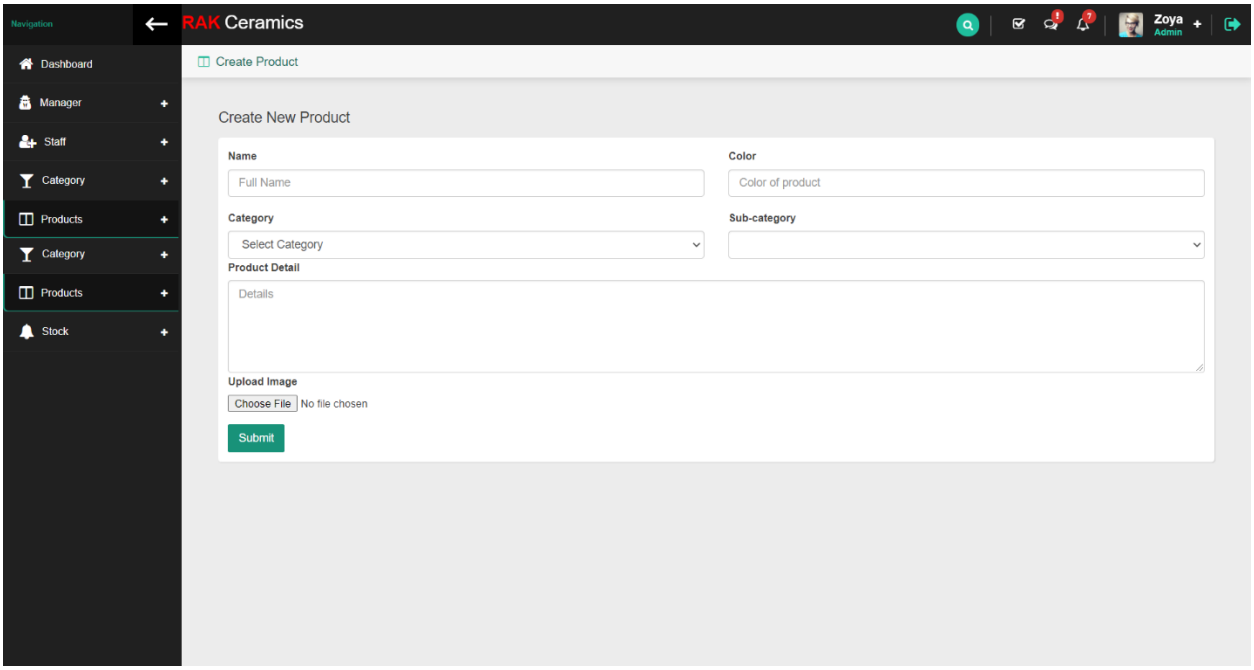

Figure 24:UI - Product

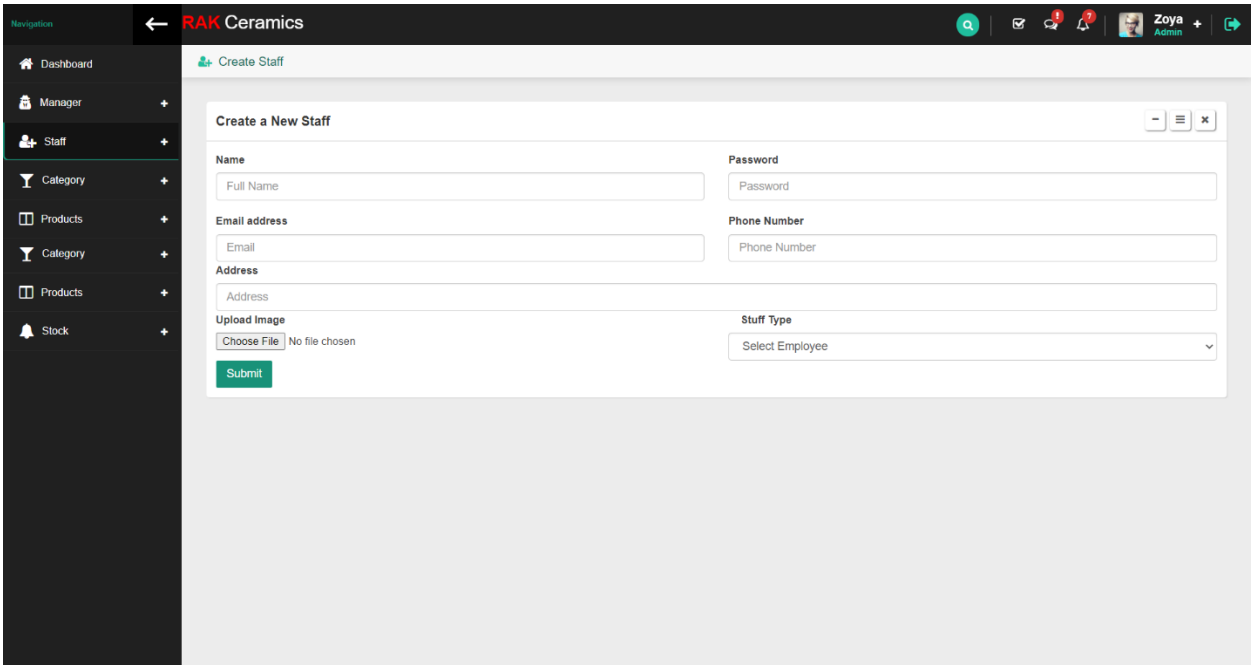

Figure 25: UI- Create Stuff

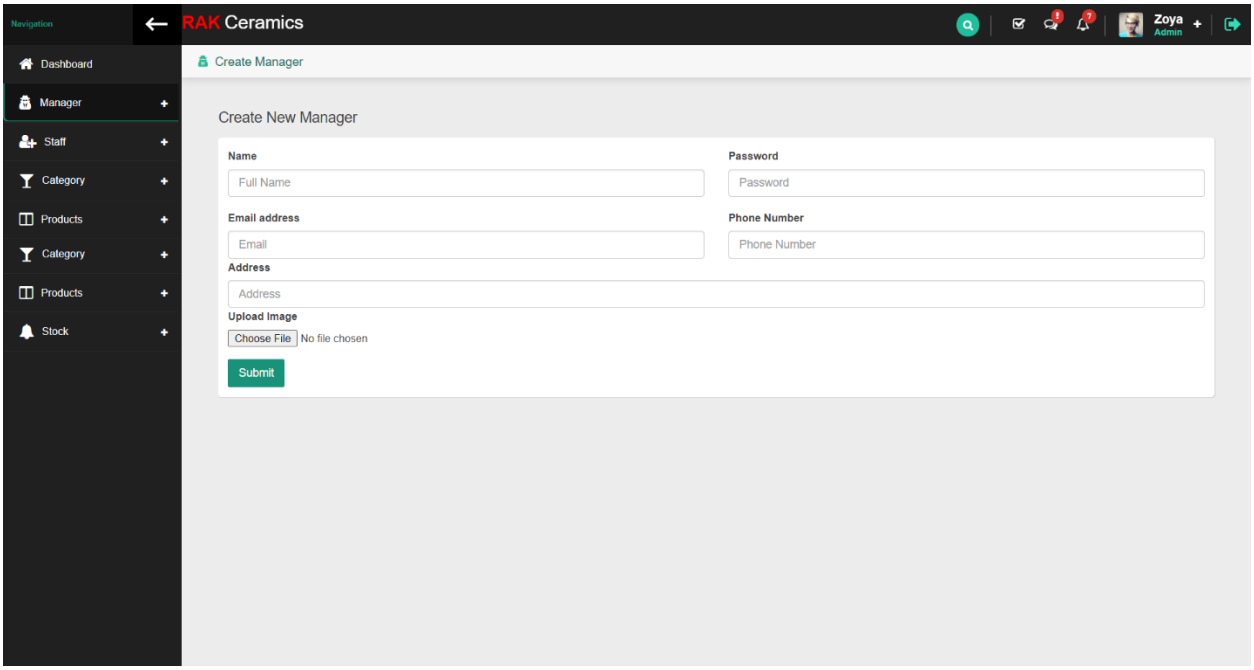

Figure 26: Add new Manager

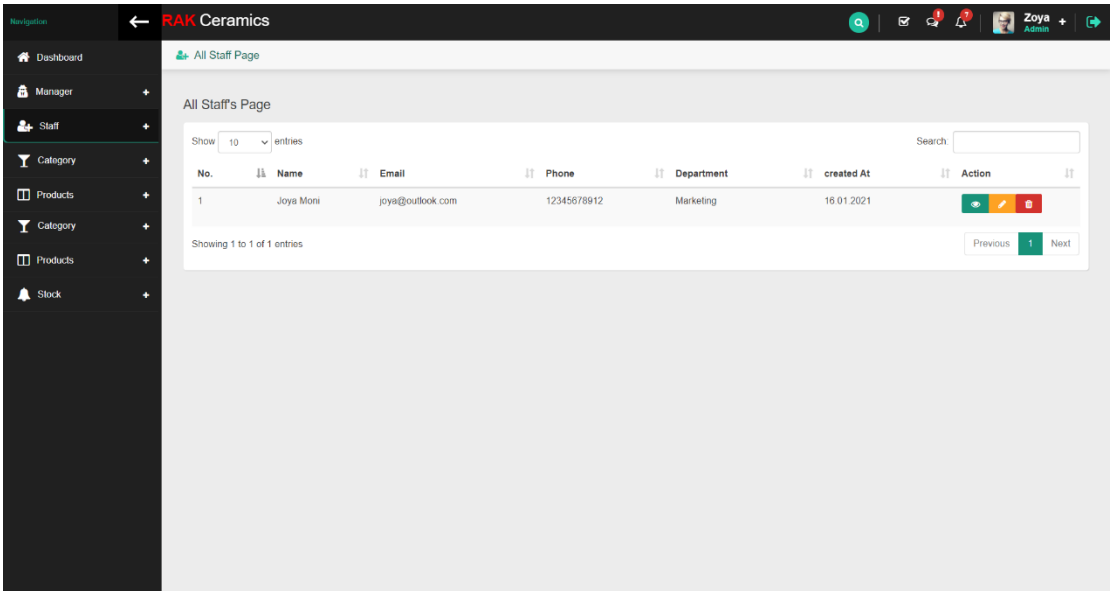

Figure 27: All Stuff

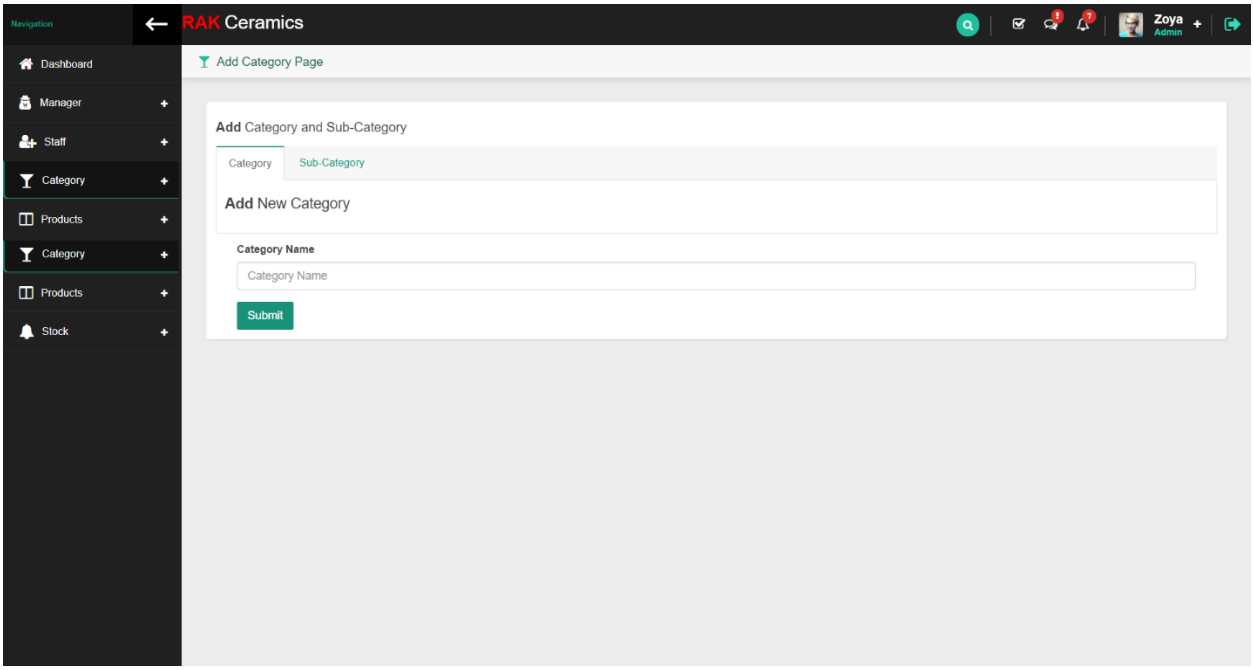

Figure 28: Add category

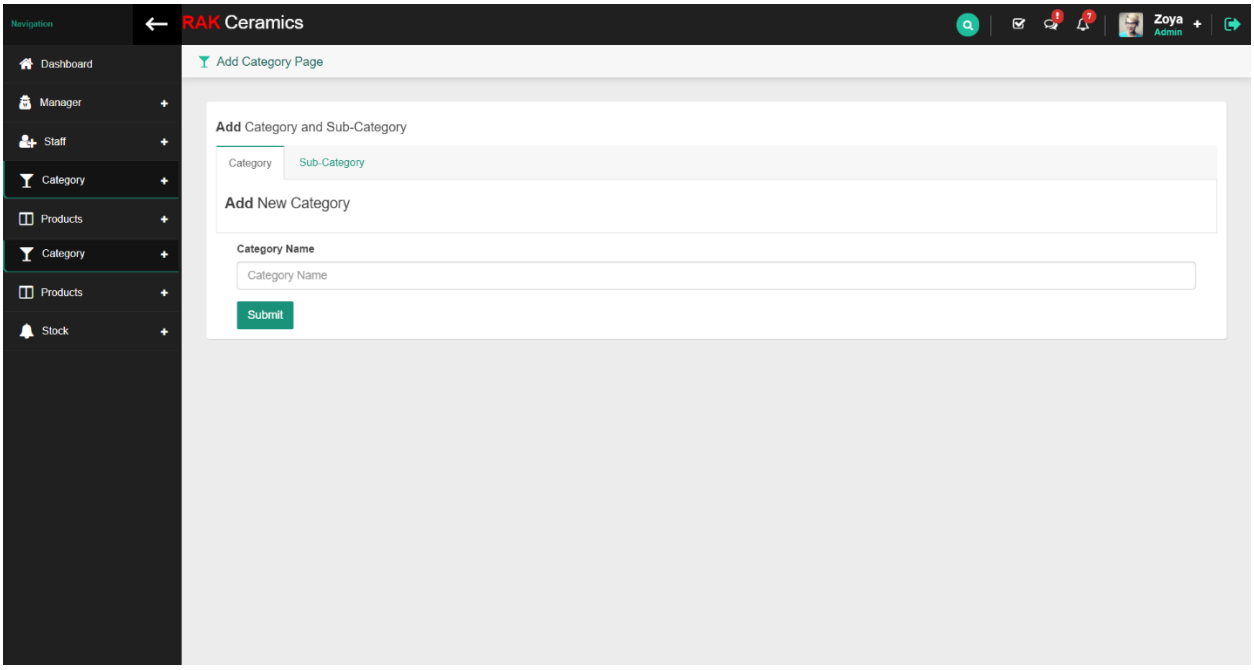

Figure 29:UI- Category

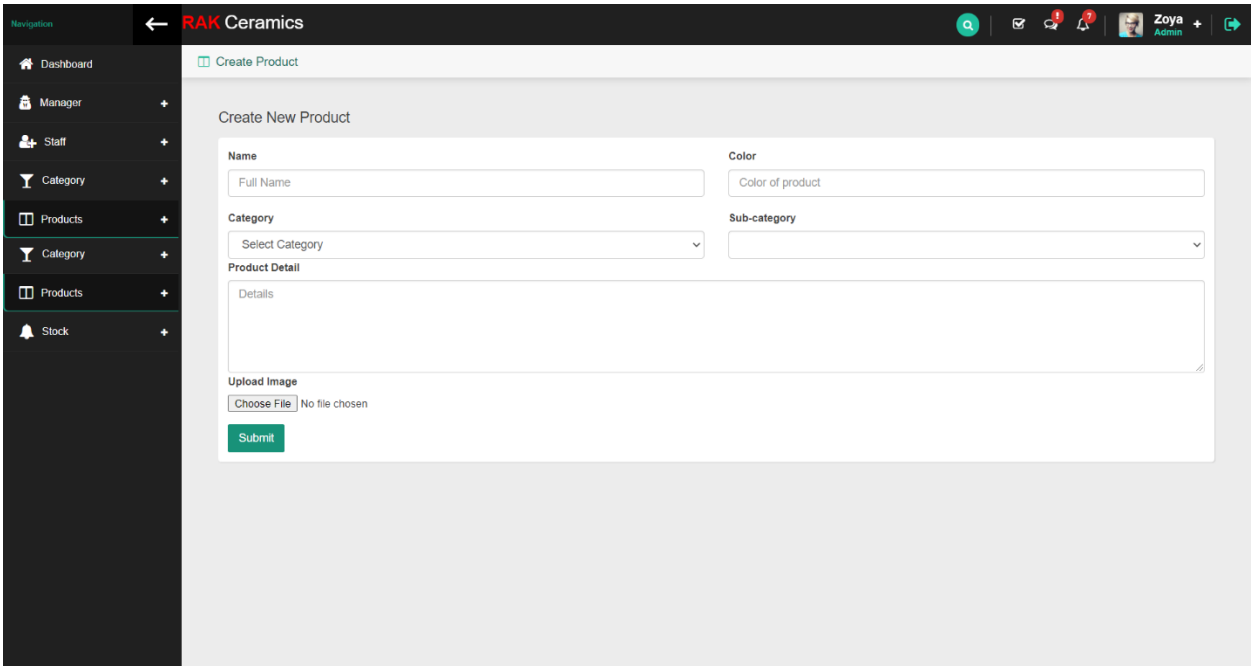

Figure 30: UI- Create Product

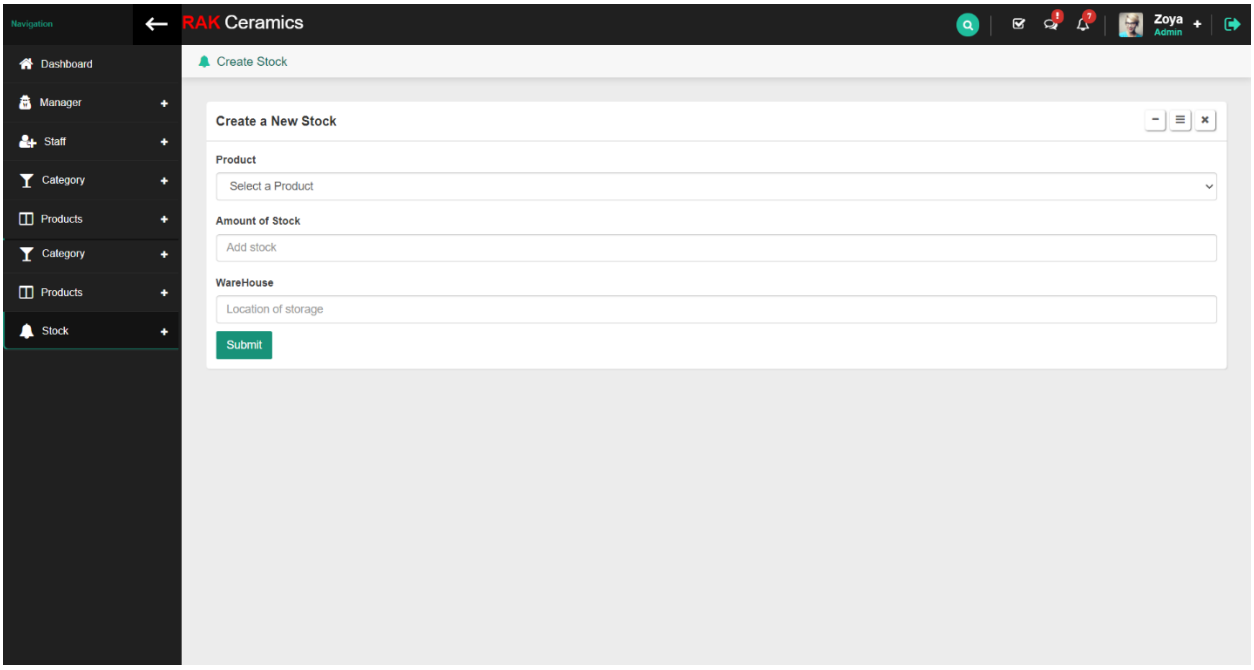

Figure 31:UI Create New Stock

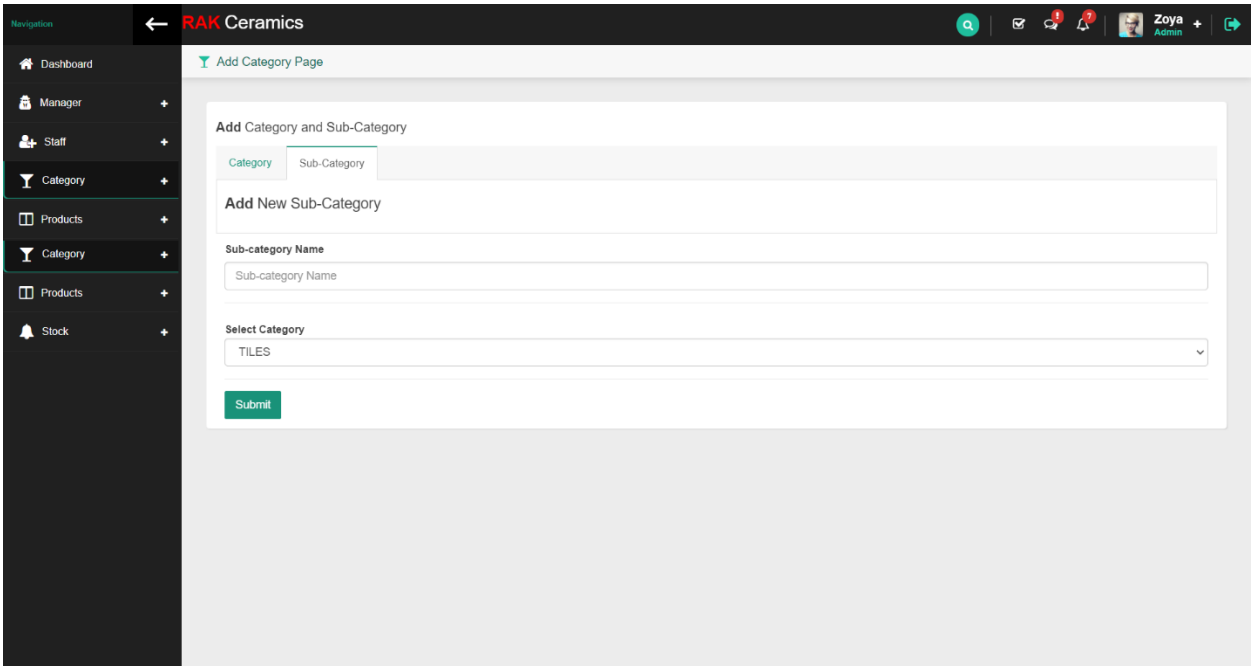

Figure 32: UI- Sub Category