CHAPTER 1

1. INTRODUCTION

1.1 GENERAL INTRODUCTION

Essentially still positioned as a provider of cloud-based Customer Relationship Management (CRM) software, Salesforce has long played the wider platform-play and now talks about the use of its platform as a facilitating layer that can support a much wider range of business software applications.

Optical + CRM is a customer-oriented point of sale application and is specifically designed to handle Optical Retail Sales and customized workflow surrounding the order processing (product submission to local or external labs, and the product assembly).

- Our system allows you to group Frames, Lenses and add on (tinting, specialized frame edging, etc) into an order item group
- Order Item Groups can be attached to an existing Eye Prescription and submitted to the Lab for processing.
- If you have your own lab processing facility, they can log in and accept/reject orders, process them, and then ship the products back to the ordering store, all managed through our system.
- Main AI and machine learning module REAL-TIME FACE RECOGNITION BASED ON OPTICAL FLOW AND HISTOGRAM EQUALIZATION technology is used to detect face

1.2 GENERAL SYSTEM FEATURES

- System Dashboard - organizational analytics at a glance
- Complete Appointment book with direct link to customer record
- Full Customer Demographics (Name, Address, contact info, etc)
- Patient Insurance Information (which can be attached to orders for payment management)
- Patient Eye Prescription Information (which can be attached to product group and submitted to lab)
- Provided ability to enter “expected payments” from insurance companies, which allows for a more precise receipt to the customer at time of sale

- Customer Orders (current and history)
- Discount support
- Unlimited comments about customers, and on orders
- Customizable products with multiple pricing options
- Product Grouping (to allow processing multiple items as a group)
- Orders queue for processing outstanding orders
- Support for both Internal and External order processing (with customizable sub-statuses)
- Bar Code Scanning support to add products to orders
- Ability to save user defined searches which allow for customized workflow processing
- Full Accounting Module (with payments, adjustments and refunds)
- Accounts Receivable follow up area to easily find accounts with outstanding balances
- Integrated Credit Card Processing (charges, void, refund)
- Complete Inventory Management (with barcode scanning support)
- Shipment support (between locations)
- Support for stock transfers (between locations)
- Shipment queue for managing pending and outstanding shipments
- Multiple Reports for Orders, Order Items, Transactions, Product Sales, Payments and more Support for multiple locations (reports will run against all locations, or any individual location)
- Fully Customizable Security (utilizing both groups and users)
- Client Customizable settings to tweak how the system behaves
- Ability to import products and customers
- Complete Accessibility - log in from anywhere in the world (with options to restrict users by IP Address or mask)

1.3 OBJECTIVE/GOAL OF PROJECT

Definition: Information System Analysis and Design is method to develop and maintain the system that perform basic business functions. The analysis and design are mainly base on understanding business objectives and processes.

Goal: The overall goal of *System Analysis* is to study procedural components and modules. The goal of *System Design*s to design whole software, which fulfils all the requirements of customer**.** This leads to improve organizational systems, by applying software, which helps employees to perform business, tasks more effectively.

1.1 SCOPE

This document provides a description of the technical design for Optical CRM Software Information System. This document's primary purpose is to describe the technical vision for how business requirements will be realized. This document provides an architectural overview of the system to depict different aspects of the system. This document also functions as a reference point for developers. Please note that this is a baseline document and may be updated as development progresses

1.4 PROBLEM DESCRIPTION

System analysis involves examining the business situation through which it is determined how to find a solution for a problem or develop a system successfully. This activity involves breaking the total development process in to smaller activities or phases that the actual task may be done in a smooth manner. In order that a successful system may be designed, developed and implemented, there is a great need and importance of defining a problem, so that the solution may be ascertained accordingly.

This leads to the phase of system investigation. The phase of system investigation involves defining the problem clearly. In order that it may be done as conveniently as possible, an analyst or a consultant is invited, so that the user can define the problem of which, at a later stage, the solution may be ascertained

1.5 SOFTWARE DEVELOPMENT LIFE CYCLE

SDLC process aims to produce high-quality software that meets customer expectations. The system development should be complete in the pre-defined time frame and cost. SDLC consists of a detailed plan which explains how to plan, build, and maintain specific software. Every phase of the SDLC life cycle has its own process and deliverables that feed into the next phase. SDLC stands for Software Development Lifecycle.

The entire SDLC process divided into the following stages:

- Phase 1: Requirement collection and analysis
- Phase 2: Feasibility study:
- Phase 3: Design:
- Phase 4: Coding:
- Phase 5: Testing:
- Phase 6: Installation/Deployment:
- Phase 7: Maintenance:

1.5.1 AGILE SDLC MODE

Agile SDLC model is a combination of iterative and incremental process models with focus on process adaptability and customer satisfaction by rapid delivery of working software product. Agile Methods break the product into small incremental builds. These builds are provided in iterations. Each iteration typically lasts from about one to three weeks. Every iteration involves cross functional teams working simultaneously on various areas like −

- Planning
- Requirements Analysis
- Design
- Coding
- Unit Testing and Acceptance Testing.

1.5.2 PRINCIPLES OF AGILE MODEL:

- To establish close contact with the customer during development and to gain a clear understanding of various requirements, each Agile project usually includes a customer representative on the team. At the end of each iteration stakeholders and the customer representative review, the progress made and re-evaluate the requirements.

- Agile model relies on working software deployment rather than comprehensive documentation.

- Frequent delivery of incremental versions of the software to the customer representative in intervals of few weeks.

- Requirement change requests from the customer are encouraged and efficiently incorporated.

- It emphasizes on having efficient team members and enhancing communications among them is given more importance. It is realized that enhanced communication among the development team members can be achieved through face-to-face communication rather than through the exchange of formal documents.

- It is recommended that the development team size should be kept small (5 to 9 peoples) to help the team members meaningfully engage in face-to-face communication and have collaborative work environment.

- Agile development process usually deploy Pair Programming. In Pair programming, two programmers work together at one work-station. One does coding while the other reviews the code as it is typed in. The two programmers switch their roles every hour or so.

1.5.3 ADVANTAGES OF AGILE:

- Working through Pair programming produce well written compact programs which has fewer errors as compared to programmers working alone.
- It reduces total development time of the whole project.
- Customer representative get the idea of updated software products after each irritation. So, it is easy for him to change any requirement if needed.

1.5.4 AGILE SCRUM

Scrum is an agile way to manage a project, usually software development. Agile software development with Scrum is often perceived as a methodology; but rather than viewing Scrum as methodology, think of it as a framework for managing a process.

In the agile Scrum world, instead of providing complete, detailed descriptions of how everything is to be done on a project, much of it is left up to the Scrum software development team. This is because the team will know best how to solve the problem they are presented.

Scrum relies on a self-organizing, cross-functional team. The scrum team is self-organizing in that there is no overall team leader who decides which person will do which task or how a problem will be solved. Those are issues that are decided by the team as a whole.

And in Scrum, a team is cross functional, meaning everyone is needed to take a feature from idea to implementation.

Within agile development, Scrum teams are supported by two specific roles. The first is a **ScrumMaster**, who can be thought of as a coach for the team, helping team members use the Scrum process to perform at the highest level.

The **product owner (PO)** is the other role, and in Scrum software development, represents the business, customers or users, and guides the team toward building the right product

1.5.5 SCRUM DEVELOPMENT(SPRINTS)

The Scrum model suggests that projects progress via a series of **sprints**. In keeping with an agile methodology, sprints are timeboxed to no more than a month long, most commonly two weeks.Scrum methodology advocates for a planning meeting at the start of the sprint, where team members figure out how many items they can commit to, and then create a sprint backlog – a list of the tasks to perform during the sprint.

During an agile Scrum sprint, the Scrum team takes a small set of features from idea to coded and tested functionality. At the end, these features are done, meaning coded, tested and integrated into the evolving product or system.

On each day of the sprint, all team members should attend a daily Scrum meeting, including the ScrumMaster and the product owner. This meeting is timeboxed to no more than 15 minutes. During that time, team members share what they worked on the prior day, will work on that day, and identify any impediments to progress.

At the end of a sprint, the team conducts a sprint review during which the team demonstrates the new functionality to the PO or any other stakeholder who wishes to provide feedback that could influence the next sprint.

Another activity in Scrum project management is the sprint retrospective at the end of each sprint. The whole team participates in this meeting, including the ScrumMaster and PO. The meeting is an opportunity to reflect on the sprint that has ended, and identify opportunities to improve

1.5.6 THE AGILE SCRUM PROJECT: MAIN ROLES

Product owner : product owner works to direct the team to the right goal. The product owner does this by creating a compelling vision of the product, and then conveying that vision to the team through the product backlog.The product owner is responsible for prioritizing the backlog during Scrum development, to ensure it's up to par as more is learned about the system being built, its users, the team and so on.

ScrumMaster: The ScrumMaster is the team's coach, and helps Scrum practitioners achieve their highest level of performance.In the Scrum process, a ScrumMaster differs from a traditional project manager in many ways, including that this role does not provide day-to-day direction to the team and does not assign tasks to individuals. ScrumMaster shelters the team from outside distractions, allowing team members to focus maniacally during the sprint on the goal they have selected.

Scrum team: The third and final role in Scrum project management is the Scrum team itself. Although individuals may join the team with various job titles, in Scrum, those titles are insignificant. Scrum methodology states that each person contributes in whatever way they can to complete the work of each sprint

1.5.7 AGILE TOOLS FOR SOFTWARE TEAMS

- The **Scrum task board** Usually, task boards include columns for stories, to-dos, work in process, things needing verification and items finished.We are using Jira

Jira: Jira Software is built for every member of your software team to plan ,track and release great software

Create user stories and issues, plan sprints, and distribute tasks across your software team.

Track Prioritize and discuss your team's work in full context with complete visibility.

Release Ship with confidence and sanity knowing the information you have is always up-to-date.

Report Improve team performance based on real-time, visual data that your team can put to use.

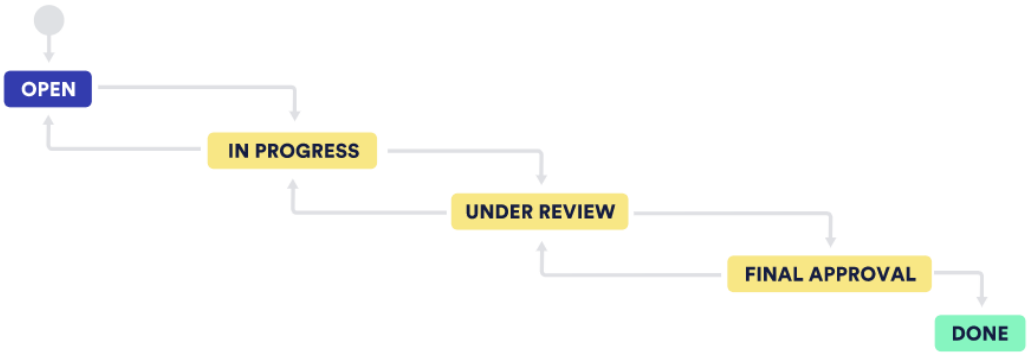

Fig Jira Process flow

- **Communication channel** :Slack is essentially a chat room for your whole company, designed to replace email as your primary method of communication and sharing. Its workspaces allow you to organize communications by channels for group discussions and allows for private messages to share information, files, and more all in one place.

CHAPTER 2

2. LITERATURE SURVEY

2.1 STUDY OF SIMILAR WORK

Online shopping certainly offers convenience from the comfort of your home. It also allows you to research what you want while finding the right price to match your budget. That holds true even for eyeglasses.

Armed with a prescription from your optometrist, there is no shortage of websites that now cater to the vision crowd. But be wary, ordering a pair of glasses online is not as easy as purchasing a pair of blue jeans or theater tickets.

Every pair of eyeglasses must be custom-fitted to not just comfortably suit your face but also to meet your particular prescriptive needs. In short, you, your optometrist and your optician must work together in order to ensure a proper fit.

There's also a lingering question about the quality and safety of prescription eyewear ordered online. In a recent study, researchers discovered that nearly half of all glasses (44.8 percent) ordered online either contained an inaccurate prescription or didn't meet safety standards designed to protect the eyes.

What's an online diehard to do when it comes to buying eyeglasses on the Internet? You need to take several steps to ensure proper fit and look closely at each online seller's ability to help you before and after your purchase.

Getting The Right Look

Online retailers of eyeglasses provide an extensive selection of frames. You simply view the choices and features that include color, frame material such as plastic, metal, or a combination, as well as and how the lenses are held in place (such as drill-mounted or rimless).

You also need to consider the various options available for the lenses, and what is best for your particular prescription and lifestyle. Lenses come in various materials: such as traditional plastic, as well as thinner, lighter materials. Other considerations are the different coatings and treatments available such as non-glare coatings and photochromic lenses.

Does your face look better with round, oval or rectangular lenses? Of course, many of these lens shapes and material selections should be ruled out based on your prescription. For

example, multifocal (bifocal, trifocal, and progressive addition) lenses generally require a specific minimum amount of room in the lenses to accommodate the entire prescription.

Some websites guide you through this process with tips to find the right frames and lenses to fit your face shape. Some sites use a virtual feature where you upload a photo and then see how each selection looks. Some even ship frames for free to try before you buy.

Accuracy Matters

Don't confuse the right look with the right measurements for your glasses. Pupil distance (PD) determines where to place the center of each lens in your frames to customize the optics to your eyes. This measurement is critical to ensure that your glasses provide the best possible vision results.

Measuring your PD is akin to cutting your own hair. It isn't easy. Most online retailers highly recommend that your optometrist provide this measurement to ensure accuracy. But this measurement is not part of your prescription and not normally provided unless you ask for it. Your optometrist or optician can even legitimately charge for the service of providing your PD. The measurements needed for multifocals can only be accurately made once the frame is selected and properly fitted to your face, so typically this measurement is simply estimated for online spectacles.

Comfort Counts

The right look and the right measurements matter little if your eyeglasses simply don't fit your face or your needs.

If your frames are too large, too heavy, or don't sit on the bridge of your nose the right way, they will slip. Besides being just downright uncomfortable, this may cause vision problems and/or headaches since you won't be looking through the correct areas of the lenses.

On the other hand, if you select frames that are too small, they may pinch and become extremely uncomfortable on your ears and nose and cause similar vision problems. Looking at an image of the frames on a computer screen makes it very difficult to know what size frame fits the best, and you certainly cannot tell how comfortable a frame is until you actually put it on.

An experienced optometrist and his/her staff have a big advantage in hands-on service in walking you through the various factors in finding the right eyeglasses. Plus, an optometrist's knowledge and experience can play a big role in guiding you to the frames and lenses that fit your needs and style. An experienced optometrist or optician can judge if a particular frame works well with your lenses, and can recommend thinner, lighter lenses to improve comfort and the look, especially if you have a special need for a stronger prescription. An experienced optometrist or optician will also be able to recommend the proper prescription sunglasses, safety glasses and even non-prescription sunglasses for those times you choose to wear contact lenses.

Consider This

If you want to order eyeglasses online, you should also check each online retailer's policies.

- **Returns:** What is the website's return policy if you are not satisfied with your purchase? How will the website deal with issues of prescription inaccuracies or other mistakes (wrong lenses coatings, wrong color, etc)?
- **Warrantees:** Does the online retailer offers protection against lens scratching, how long this may be covered and what needs to be done to replace scratched lenses. How long is the frame warranty? What about children's frames?
- **Shipping:** The cost and timeliness of shipments varies. Who pays for shipping returns?
- **Pricing:** Are protective eyeglass cases and cleaning cloths included, or are they "extras" added to the cost?
- **Insurance:** Some websites do not accept vision insurance. If you have a Flexible Spending Account (FSA), check to see what's required to accept this as payment.
- **Maintenance:** Some websites provide a contact for this and may offer online tips for minor adjustments, but it might mean shipping your glasses away and being without them until the service is completed and they are returned.

Whether you go it alone on the Internet or use the services of your optometrist, it's important to be informed. Take the time to get it right. After all, it's essential to make the necessary selections and measurements to enhance your vision with a look that fits and provides comfort.

2.1.1 EXISTING SYSTEM

The current system using now is manually system, means that all they process of managing the shop business flow is written in paperwork. During the transaction process, they just only use paper receipt but not printed receipt. Besides, they do not have any record on the customer profile, and staff profile. If they want to refer back their customer eye degree, they only can refer back the receipt that give to the customer before to get their previous record on the eye degree. If need to find out the receipt, they have to check it one by one, so it takes quite a long time. Furthermore, the daily sell they record down on a log book and end of the month they have to calculate it manually. Adding for the staff commission, they also need to refer back They receive one by one to calculate the total sale on the particular staff. These processes are time consuming by doing it one by one. The shop does not have any well inventory management at the same time. Overall system flow for is using traditional management system. Also, advance Ai technology is not used in their online market

Unfortunately, not all salespeople are considerate professionals that take pride in their job. Sometimes you may be out of luck and run into someone who hasn’t been properly trained and may make mistakes. After all, they’re only human too.

However, they’re not always as invested as you in finding the right glasses and may not provide the best advice that is the most honest. Matters can be made much worse if they’re busy due to new stock or too many customers. This could lead to an overall disappointing experience.

2.1.2 DRAWBACKS OF EXISTING SYSTEM

- **Pressure**

We've already suggested that a salesperson could be inattentive or undertrained. However, what if they're the opposite and not in a good way? Sometimes you can run into a pushy seller who wants you to buy either the most expensive frames or to make your choice too quickly.

You'll feel rushed and making decisions under duress never ends well. If staff work on a commission's basis, they may be even harder on you as they may hover rather than let you try in peace.

- **Crowds**

Free time is sacred and a rare luxury. Sadly, most of us tend to all have it at the same time: after work or on weekends. Therefore, the chances are that everyone else will be heading to the store the same time as you.

A crowded store surrounded by people is never a positive experience. When you're doing something as personal as choosing glasses, it's even worse. The result can lead to long queues, long waits to see a salesperson and a generally hurried experience.

- **Limited Selection**

So-called "curated" ranges as we mentioned above are a double-edged sword. In one way, they can be liberating as the decision process is easier. However, they can be a nightmare as you may not find the glasses that you want.

If it isn't in their inventory, you may be forced to make a special order. This means that you'll then have to make time to come back another day.

- **Pricing**

You often hear jokes about remortgaging the house in order to get new glasses. This is perhaps an exaggeration but glasses typically cost a small fortune.

You can understand to a certain extent why stores charge so much. After all, you pay for the service but they also have a number of overheads from rent, bills and salaries.

However, as a consumer, this makes things so much harder. The entry price is often very high and almost impossible to achieve on a tight budget.

CHAPTER 3

3. OVERALL DESCRIPTION

3.1 PROPOSED SYSTEM

Optical + CRM is a customer-oriented point of sale application and is specifically designed to handle Optical Retail Sales and customized workflow surrounding the order processing (product submission to local or external labs, and the product assembly).

- Our system allows you to group Frames, Lenses and add on (tinting, specialized frame edging, etc) into order item group
- Order Item Groups can be attached to an existing Eye Prescription and submitted to the Lab for processing.
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- Main AI and machine learning module REAL-TIME FACE RECOGNITION BASED ON OPTICAL FLOW AND HISTOGRAM EQUALIZATION technology is used to detect face

3.2 FEATURES OF PROPOSED SYSTEM

- System Dashboard - organizational analytics at a glance
- Complete Appointment book with direct link to customer record
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- Support for stock transfers (between locations)
- Shipment queue for managing pending and outstanding shipments
- Multiple Reports for Orders, Order Items, Transactions, Product Sales, Payments and more Support for multiple locations (reports will run against all locations, or any individual location)
- Fully Customizable Security (utilizing both groups and users)
- Client Customizable settings to tweak how the system behaves
- Ability to import products and customers
- Complete Accessibility - log in from anywhere in the world (with options to restrict users by IP Address or mask)

3.3 FUNCTIONS OF PROPOSED SYSTEM

Enhancement: The main objective of Optical CRM is to enhance and upgrade the existing system by increasing its efficiency and effectiveness. The software improves the working methods by replacing the existing manual system with the computer-based system.

Automation: The Optical CRM automates each and every activity of the manual system and increases its throughput. Thus, the response time of the system is very less and it works very fast.

Accuracy: The Optical CRM provides the uses a quick response with very accurate information regarding the users etc. Any details or system in an accurate manner, as and when required.

User-Friendly: The software Optical CRM System has a very user-friendly interface. Thus, the users will feel very easy to work on it. The software provides accuracy along with a pleasant interface. Make the present manual system more interactive, speedy and user friendly.

Availability: The transaction reports of the system can be retried as and when required. Thus, there is no delay in the availability of any information, whatever needed, can be captured very quickly and easily.

Maintenance Cost: Reduce the cost of maintenance.

3.4 FEASIBILITY ANALYSIS / STUDY

The main aim of the feasibility study activity is to determine. Whether it would be financially and technically feasible to develop the product. The feasibility study activity involves analysis of the problem and collection of all relevant information relating to the product such as the different data items which would be input to the system the processing required to be carried out of these data, the output data required to be carried out of these data, the output data required to be produced by the system, as well as various constraints on the behaviour of the system.

In our software we would find the actual requirements of this software and add that features Such as monitoring, process scanning etc. For adding this feature, we will like take different ways to solving this last find the best way to complete these features.

Feasibility studies aim to objectively and rationally uncover the strengths and weakness of the existing business or proposed venture, opportunities and threats as presented by the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained As such, a well-designed feasibility study should provide a historical background of the business or project, description of the product or vice, accounting statements, details of the operations and management, marketing research and policies, financial data, legal requirements and tax obligations. Generally, studies precede technical development and project implementation.

The feasibility study to be conducted for this project involves.

3.4.1 TECHNICAL FEASIBILITY

The assessment is based on an outline design of system requirements in terms of Input, Processes, Output, Fields, Programs, and Procedures. This can be quantified in terms of volumes of data, trends, frequency of updating, etc. in order to estimate whether the new system will perform adequately or not. Technological feasibility is carried out to determine whether the company has the capability, in terms of software, hardware, personnel and expertise, to handle the completion of the project when writing a feasibility report, the following should be taken to consideration. A brief description of the business the part of the business being looked towards. The human and economic factor the possible solutions to the problems.

The system is technically feasible

3.4.2 OPERATIONAL FEASIBILITY

Operational analysis is the most frequently used method for evaluating the effectiveness of a new system. More commonly known as cost/benefit analysis, the procedure is to determine the benefits and saving that are expected from a candidate system and compare them with costs. If benefits outweigh costs, then the decision is made to design and implement the system. An entrepreneur must accurately weigh the cost versus benefits before taking an action. Cost-based study: It is important to identify cost and benefit factors, which can be categorized as follows:

1. Development costs.
2. Operating costs.

This is an analysis of the costs to be incurred in the system and benefits derivable out of the system. Time-based study: This is an analysis of the time required to achieve a return on investments the future value of a project is also a factor. The system is operationally Feasible.

3.4.3 ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus, the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

In case of new project, financial viability can be judged on the following parameters:

- Total estimated cost of the project
- Financing of the project in terms of its capital structure, debt equity ratio and promoter ‘s share of total cost
- Existing investment by the promoter in any other business

Projected cash flow and profitability.

The system is Economically Feasible

3.4.4 BEHAVIOURAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of shipping the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

CHAPTER 4

4. OPERATING ENVIRONMENT

4.1 HARDWARE REQUIREMENTS USED FOR DEVELOPMENT

Processor	: Intel i5 8th Gen
RAM	: 16GB ddr4
Hard disk	: 2048 GB SSD
Drives	: CD ROM , C-type Port , USB 3.1*2 Port
Display Size	: Compatible Size(Recommend 15’inch)
Screen Resolution	: 1920*1080 Pixels
Keyboard	: Wireless Enabled Keyboard (Recommend :Logitech)
Keyboard Mouse	:Wireless Enabled Mouse (Recommend :Logitech)
Monitor	: Touch Capacity LED Monitor
Dedicated Graphics Card	: Nvidia Geforce GTX 1050 4GB DDR5
Camera	:8 Megapixel Full HD 1.8f lens
Extra	:Wifi Adapter,Bluetooth Adapter

4.1.1 SOFTWARE REQUIREMENT USED FOR DEVELOPMENT

Operating System	: Windows(7/8/10)/Ubuntu(14/16/18/20)
Software Drivers	: WiFi drivers .Bluetooth Drivers, Visual Studio Drivers Nvidia GeForce Graphics drivers, Intel Drivers and Camera Drivers
Programming Language	: Python
IDE	: Pycharm ,Visual Studio Code,OpenCV
Scripting Languages	: HTML,CSS,Javascript
Web Browser	: Google Chrome
Front-End	: Python, Django
Back-End	: My SQL

4.2 HARDWARE REQUIREMENTS FOR END USER

Processor	: Intel i5 4th Gen
RAM	: 8GB ddr4
Hard Disk	: 256 GB SSD
Drives	: C-type Port , USB 3.1*2 Port
Display Size	: Compatible Size(Recommend 15’inch)
Screen Resolution	: 1920*1080 Pixels
Keyboard	: Wireless Enabled Keyboard (Recommend :Logitech)
Keyboard Mouse	:Wireless Enabled Mouse (Recommend :Logitech)
Monitor	: Touch Capacity LED Monitor
Dedicated Graphics Card	: Nvidia Geforce 920m 2GB DDR4
Camera	:8 Megapixel Full HD 1.8f lens
Extra	:Wifi Adapter,Bluetooth Adapter

4.2.1 SOFTWARE REQUIREMENTS FOR END USER

Operating System	: Windows(7/8/10) / Ubuntu(14/16/18/20)
Web Browser	: Google Chrome/Firefox
Software Drivers	: WiFi drivers .Bluetooth Drivers, Visual Studio Drivers Nvidia GeForce Graphics drivers, Intel Drivers and Camera Drivers

4.2TOOLS AND PLATFORMS

4.3.1 PYTHON:

Python is an interpreted, high-level, general-purpose programming language. Python offers many features that are helpful for AI and ML in particular, and that makes it the best language for these purposes. For the development of Automobile Automator python 3.0 or above is needed.

Features of Python

- Easy-to-learn − Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
- Easy-to-read − Python code is more clearly defined and visible to the eyes.
- Easy-to-maintain − Python's source code is fairly easy-to-maintain.
- A broad standard library − Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.
- Interactive Mode − Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- Portable − Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- Extendable − Can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- Databases − Python provides interfaces to all major commercial databases.
- GUI Programming − Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- Scalable − Python provides a better structure and support for large programs than shell scripting.

4.3.2 ECLIPSE PYDEV :

PyDev is a third-party plug-in for Eclipse. It is an Integrated Development Environment used for programming in Python supporting code refactoring, graphical debugging, code analysis among other features.

4.3.3 VISUAL STUDIO CODE :

Visual Studio Code is a source-code editor developed by Microsoft for Windows, Linux and macOS. It includes support for debugging, embedded Git control and GitHub, syntax highlighting, intelligent code completion, snippets, and code refactoring.

4.3.4 PYCHARM :

PyCharm is an integrated development environment (IDE) used in computer programming, specifically for the Python language. It is developed by the Czech company JetBrains. It provides code analysis, a graphical debugger, an integrated unit tester etc.

4.3.5 MYSQL:

MySQL Server is the world's most used relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. This stores data in the form of multiple related tables. The SQL phrase stands for Structured Query Language. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation.

Features of MySQL

- Relational Database Management System (RDBMS) - MySQL is a relational database management system.
- Easy to use - It is easy to use. You have to get only the basic knowledge of SQL. You can build and interact with MySQL with only a few simple SQL statements.
- Secure - MySQL consist of a solid data security layer that protects sensitive data from intruders. Passwords are encrypted in MySQL.
- Free to download - MySQL is free to use and you can download it from MySQL official website.
- Scalable - MySQL can handle almost any amount of data, up to as much as 50 million rows or more. The default file size limit is about 4 GB. However, you can increase this number to a theoretical limit of 8 TB of data.

4.4.1 SAFETY REQUIREMENTS

The application will not affect data stored outside of its servers nor will it affect any other applications installed in the system. It cannot cause any damage to the system or internal components. The application can be used in any browser or laptop, which meets minimum system specifications as mentioned above.

As per the client request the application may use

1) Google Cloud Platform provides infrastructure as a service, platform as a service, and serverless computing environments. It provides a series of modular cloud services including computing, data storage, data analytics and machine learning.

2)Amazon Web Services is a subsidiary of Amazon that provides on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis.

4.4.2 SECURITY REQUIREMENTS

Security relies on Google Cloud Platform Service Account/Data server maintained by client, for authentication, instead of the previously used client and developer access tokens. The Google security model is an end-to-end process, built on over 15 years of experience focused on keeping customers safe on Google applications like Gmail, Search and other Apps. With Google Cloud Platform your applications and data take advantage of the same security model.

CHAPTER 5

5. DESIGN

5.1 SYSTEM DESIGN

System can be defined, as an orderly grouping of interdependent components can be simple or complex. The most creative and challenging phase of the system life cycle is system design. The term design describes a final system and the process by which it is developed .It refers to the technical specifications that will be applied in implementing the candidate system .It also includes the construction of programs and program testing.

The first step in the system design is to determine how the output is to be produced and in what format. Samples of the output and the inputs are also presented .In the second step, input data and master files are to be designed to meet requirement of the proposed output .The processing phase's system's objectives and complete documentation.

System design has two phases:

- Logical
- Physical

The logical design reviews the present physical system, prepares the input and output and also prepares a logical design walk- through .We have to deal with how to take entries required and whether and how to process the user data

Physical design maps out the details of the physical system, plans the system implementation, devices a test and implementation plan and new hardware and software. We have to decide how and where to store the input data and how to process it so as to present it to the user in an easy, informative and attractive manner.

MODULES

1. Customers
2. Inventory
3. Billing
4. Face Recognition

ABOUT THE PROJECT (The main modules of the project are)

Optical CRM is one the leading optical Software with Barcode facility. Below listed are few core features of our optical CRM but there are many functions and features provided in-optical CRM within each of these core modules.

- Customers

Stay in touch with your customers and knowing their history of purchases will help your business grow.

- Add new customers with their photos and necessary information's
- edit/view/delete customers
- view customer purchase details
- add promo codes
- edit/block promo code
- view customer logs

- Inventory

Stay up to date with stocks for each product. Never run out of stock.

- Add products to the inventory with photo and other details
- can edit/view products
- stock update
- can create category
- edit/view category

- Face Recognition

Realtime Face Recognition based on AI for better customer experience. Using face recognition all registered users can automatically identified and will get better experience. Steps of face recognition are

- normalizing image
- extract features
- recognize face from image

here we applying deep learning in two key steps:

1. To apply ***face detection***, which detects the ***presence*** and location of a face in an image, but does not identify it
2. To extract the 128-d feature vectors (called “embeddings”) that ***quantify*** each face in an image.
3. user can be identified using face recognition dataset which we have collected from customers

- FACE AND EYES DETECTION WITH OPENCV
- HAAR-CASCADE DETECTION IN OPENCV

A Haar-like feature considers adjacent rectangular regions at a specific location in a detection window, sums up the pixel intensities in each region and calculates the difference between these sums. This difference is used to categorize the subsections of an image. For e.g in human face images, the region of eyes is darker than cheeks.

So when detecting an object in an image, the window of target size is moved over the input image and for each subsection of the image the Haar-like feature is calculated. This difference is then compared to the learned threshold that separates the object from non-objects.

PREPARATION OF THE TRAINING DATA

For training a boosted cascade of weak classifiers we need a set of positive samples (containing actual objects you want to detect) and a set of negative images (containing everything you do not want to detect). The set of negative samples must be prepared manually, whereas set of positive samples is created using the opencv_createsamples application.

NEGATIVE SAMPLES

Negative samples are taken from arbitrary images, not containing objects you want to detect. These negative images, from which the samples are generated, should be listed in a special negative image file containing one image path per line (can be absolute or relative)

POSITIVE SAMPLES

Positive samples are created by the opencv_createsamples application. They are used by the boosting process to define what the model should actually look for when trying to find your objects of interest. The application supports two ways of generating a positive sample dataset.

1. We can generate a bunch of positives from a single positive object image.

2. We can supply all the positives yourself and only use the tool to cut them out, resize them and put them in the opencv needed binary format.

CASCADE TRAINING

The next step is the actual training of the boosted cascade of weak classifiers, based on the positive and negative dataset that was prepared beforehand.

VISUALISING CASCADE CLASSIFIERS

From time to time it can be useful to visualise the trained cascade, to see which features it selected and how complex its stages are. For this OpenCV supplies a opencv_visualisation application.

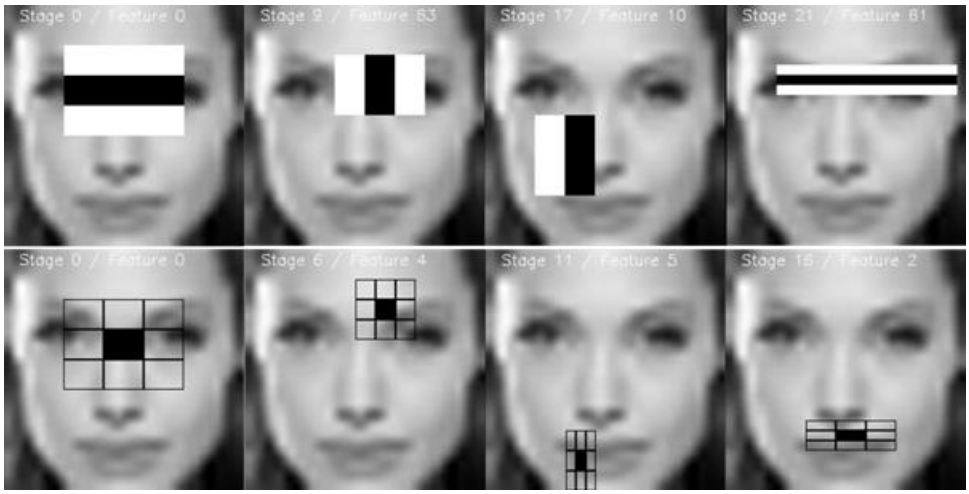


Figure 5.0

Face identification steps

Prepare Training Data: Read training images for each person/subject along with their labels, detect faces from each image and assign each detected face an integer label of the person it belongs.

- Train Face Recognizer: Train OpenCV's Local binary patterns histograms(LBPH) recognizer by feeding it the data we prepared in step 1.

- Prediction: Introduce some test images to face recognizer and see if it predicts them correctly.

- Billing

Sales is the key to success of any business but tracking sales is very important for any business. here billing system is a self-identified experience kiosk. User can view products and experience it. They can shortlist products and place an order. Payment can be done using electronic media/cash. Bill can be generated after payment confirmation

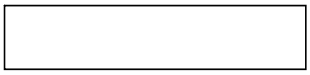
5.1.1 DATA FLOW DIAGRAM/UML

Data Flow Diagram (DFD) are directed graphs in which the nodes specify processing activities and the arcs that specify data items transmitted between processing nodes. Like flow charts DFD can be used at any desired level of abstraction. A DFD might represent data flow between individual statements or block of statements in a routine, data flow between concurrent process and data flow in a distributed computing system. Unlike flow charts DFD do not indicate a decision logic or condition under where various processing nodes in the diagram might be activated.

DFD is necessary for communicating for customer during requirement analysis; they are also widely used for representing external and internal design specifications. In the lack of structure DFD's are quite valuable for establishing meaning, conventions and names of system components such as subsystems, files and data links. A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently to make the data access easy, inexpensive and flexible to the user

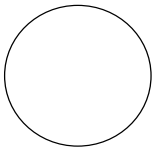
A DFD consists of a series of bubbles joined by lines. The bubble represents data transformation and line represents data flow in the system. In the normal convention a DFD has four major symbols:

- Square, this defines source or destination of data.



- Arrow, which shows data flow

- Circle, which represents a process that transforms incoming data into outgoing flow.



- Open rectangle, which shows a data store.

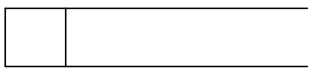


Figure 5.1 DFD Components

5.1.2 PROJECT DFD

LEVEL 0(CONTEXT LEVEL):

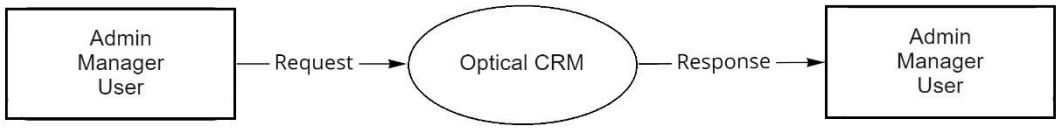


Figure 5.2 Context Diagram (Level 0)

LEVEL 1

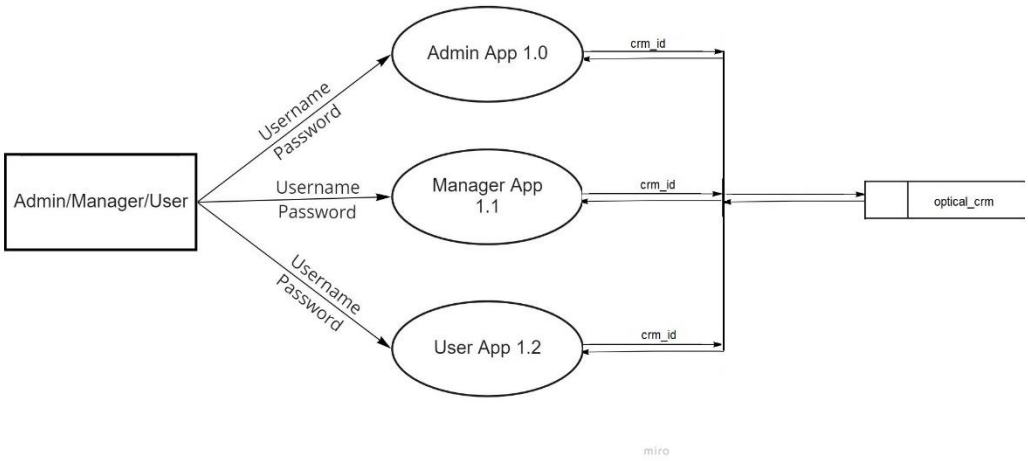


Figure 5.3 Module Description (Level 1)

LEVEL 1.1 Manager app

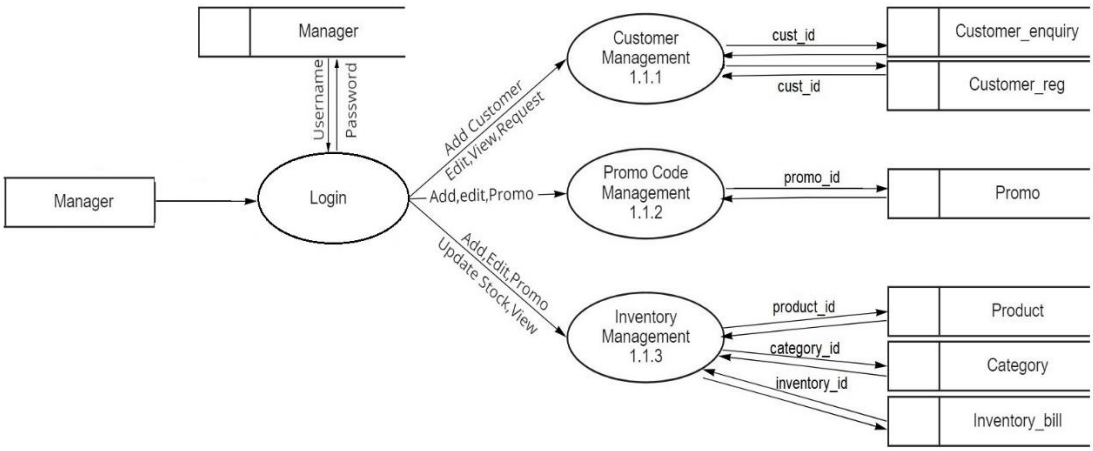


Figure 5.4 Manager Login(Level 1.1)

LEVEL 1.1.1 Customer Management

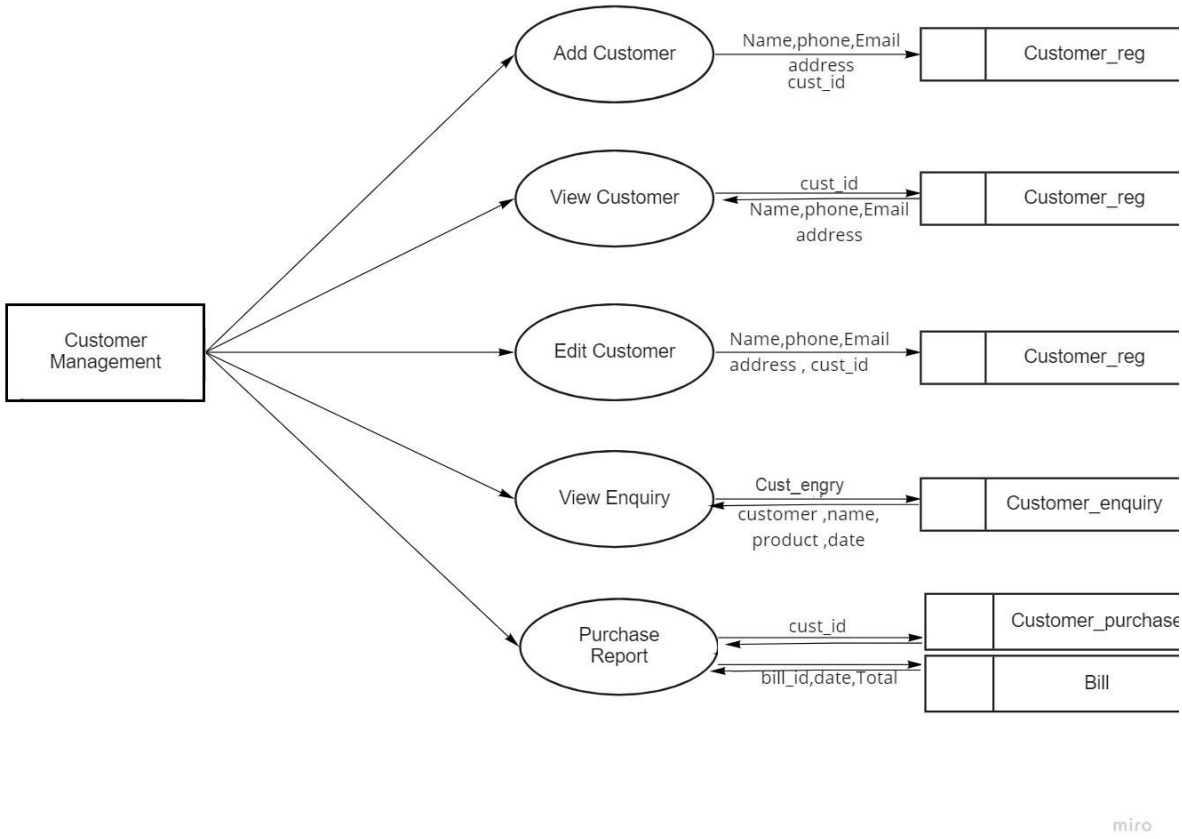


Figure 5.5 Customer Management (Level 1.1.1)

LEVEL 1.1.2 Promo Code Management

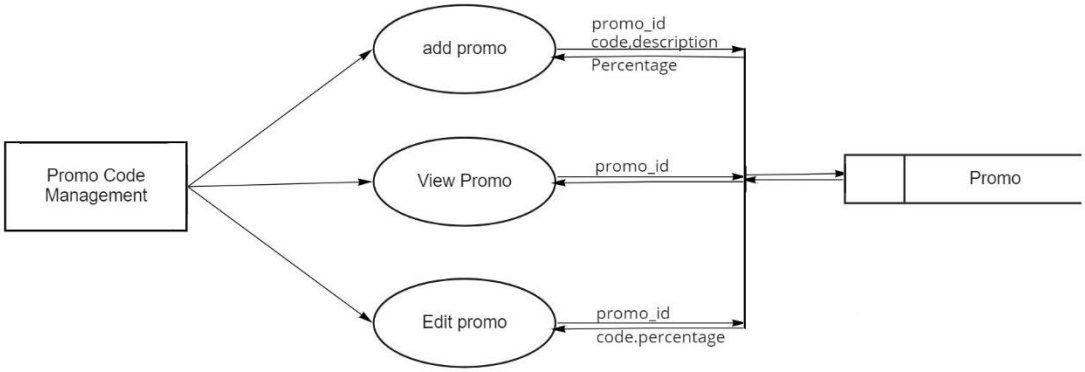


Figure 5.6 Promo Code Management (Level 1.1.2)

LEVEL 1.1.3 Inventory Management

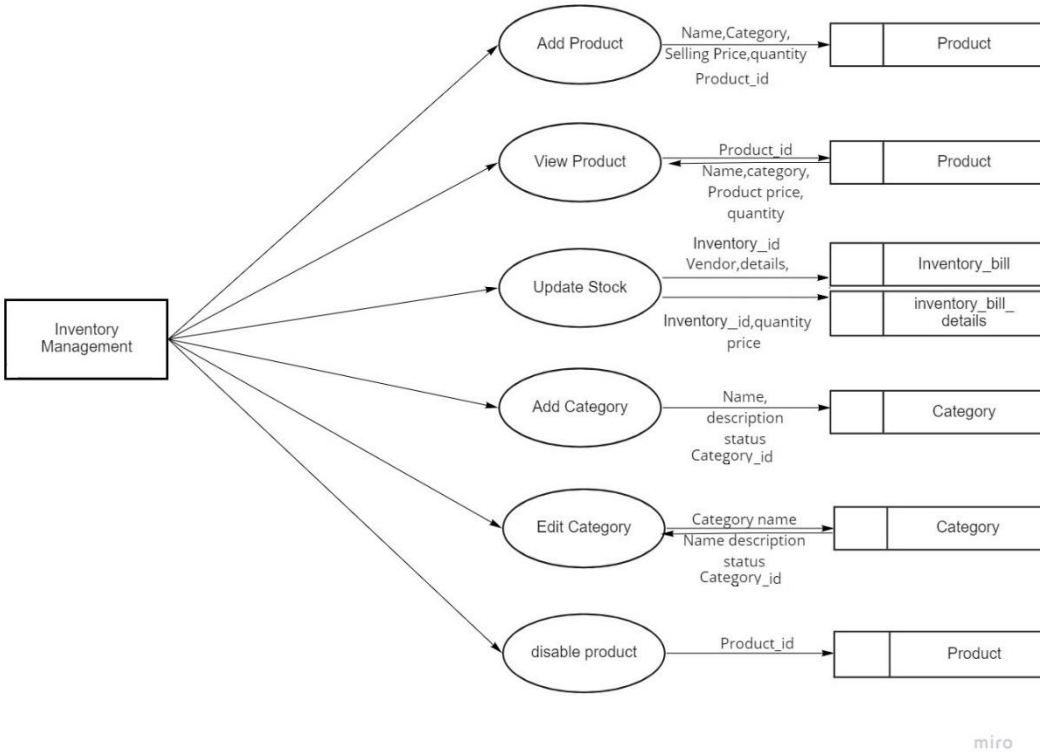


Figure 5.7 Inventory Management(Level 1.1.3)

LEVEL 1.2 User App

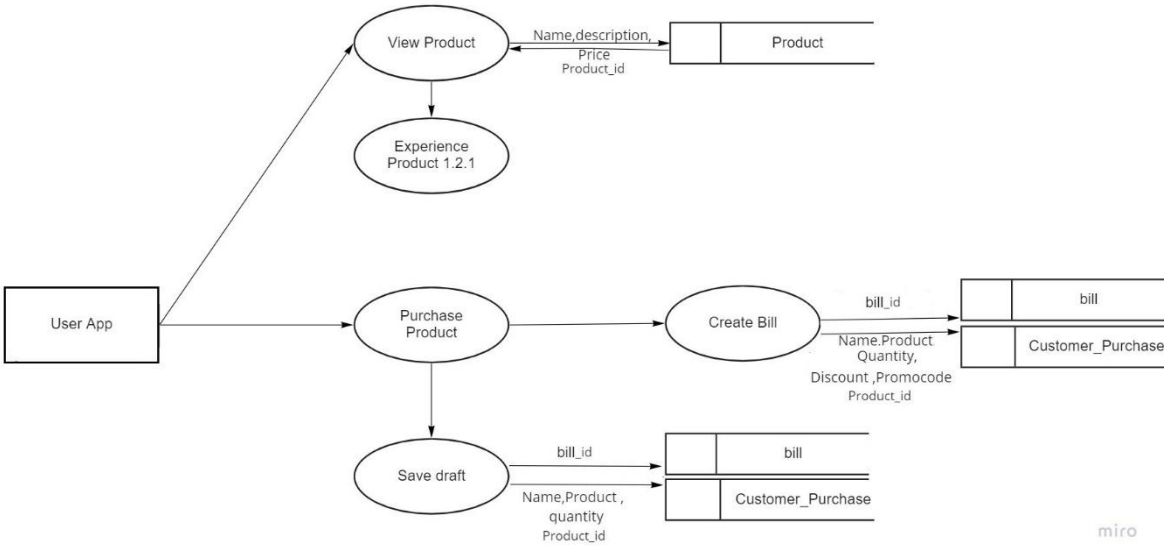


Figure 5.8 User App (Level 1.2)

LEVEL 1.2.1 Experience product

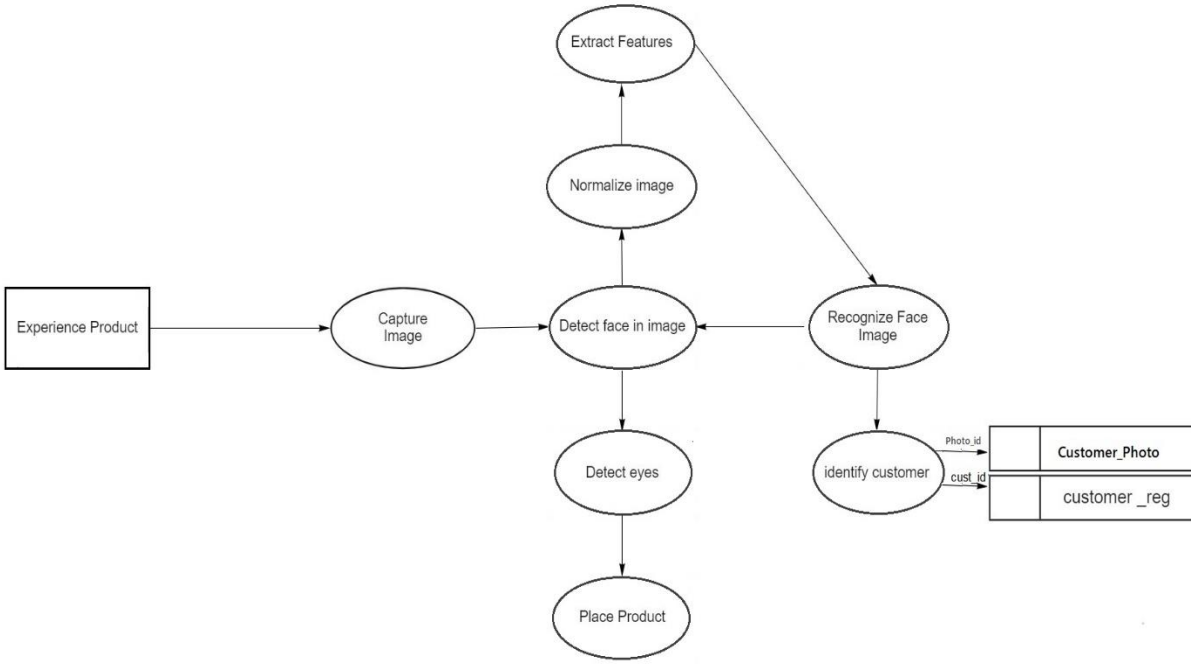


Figure 5.9 Experience product (Level 1.2.1)

5.2 DATABASE DESIGN

The database design is a logical development in the methods used by the computers to access and manipulate data stored in the various parts of the computer systems. Database is defined as an integrated collection of data. The overall objective in the development of database technology has been to treat data as an organizational resource and as an integrated whole. The main objectives of databases are data integrity and data independence.

A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and effectively. The database serves as the repository of data, so a well-designed database can lead to a better program structure and reduce procedural complexity. In a database environment, common data are available and used by several users

Database Management System (DBMS) allow the data to be protected and organized separately from other resources like hardware, software, and programs. DBMS is a software package, which contains components that are not found other data management packages. The significant of DBMS is the separation of data as seen by the programs and data as stored on the direct access storage devices. That is the difference between the logical and physical data.

The main objectives covered in database design are:

- Controlled redundancy
- Data independence
- Accuracy and integrity
- Privacy and security
- Performance.

- **Customer_reg**

Table Number: 5.1

Table Name: Customer_reg				**Primary Key: Cust_id**
Description: Customer Registration and it contains 5 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Cust_id	int(15)	Primary Key	Customer ID
2	Name	varchar(20)		Name of customer
3	Phone no	int(12)		Phone number of customer
4	Email	varchar(25)		Email ID of customer
5	Address	text		Address of Customer

- **Customer_enqry**

- Table Number: 5.2

Table Name: Customer_enqry				**Primary Key: Cust_enqry**
Description: Customer Enquiry and it contains 6 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Cust_enqry	int(15)	Primary Key	Customers Enquiry ID
2	Cust_id	int(15)	Foreign Key	Customer ID
3	Enqry details	text		Customer Enquire Details
4	Product_id	int(15)	Foreign Key	Product Details
5	Date	TimeStamp		Tested date
6	Status	Tinyint(1)		Current Situation

- **Bill**

Table Number: 5.3

Table Name: Bill				**Primary Key: bill_id**
Description: Bill Details and it contains 5 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Bill_id	int(15)	Primary Key	Bill ID
2	Cust_id	int(15)	Foreign Key	Customer ID
3	Total	int(8)		Total Amount of Purchase
4	Discount	Smallint(2)		Product discount
5	Promocode	Varchar(15)		Promo Code applied

- **Product**

Table Number: 5.4

Table Name: Product				**Primary Key: product_id**
Description: Product Details and it contains 7 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Product_id	Int(15)	Primary key	Product ID
2	Name	Varchar(20)		Name of product
3	Category_id	Int(15)	Foreign Key	Category ID
4	Purchase rate	Double		MRP of Product
5	Quantity	Smallint(2)		Number of items
6	Decription	Text		Details of product
7	Status	Tinyint(1)		Current status of product

- **Customer Photo**

Table Number: 5.5

Table Name: Customer_Photo				**Primary Key: photo_id**
Description: Customer Photo and it contains 3 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Photo_id	Int(15)	Primary Key	Photo ID
2	Name	Varchar(20)		Name of Customer
3	Cust_id	int(15)	Foreign Key	Customer ID

- **Manager**

Table Number: 5.6

Table Name:Manager				**Primary Key: manager_id**
Description: Manager Login and it contains 3 Fields				
Slno	Field Name	Data Type	Constraints	Description
1	Manager_id	Int(15)	Primary Key	Manager ID
2	User name	Varchar(10)	Foreign key	Manager User Login
3	Password	Varchar(10)		Manager User Password

- **Inventory_bill_details**

Table Number: 5.7

Table Name: Inventory_bill_detail			**Primary Key: inv_bill_details**	
Description: Billing Process and it contains 5 fields				
Slno	Field Name	Data Type	Constraints	Description
1	Inv_bill_details	Int(15)	Primary Key	Inventory Bill ID
2	Inventory_id	int(15)	Foreign Key	Inventory ID
3	Product_id	int(15)	Foreign Key	Product ID
4	Quantity	Smallint(2)		Number of items
5	Price	Int(8)		Last price

- **Inventory_bill**

Table Number: 5.8

Table Name: Inventory_bill			**Primary Key: inventory_id**	
Description: Billing and it contains 5 fields				
Slno	Field Name	Data Type	Constraints	Description
1	Vendor_id	Int(15)		Vendor ID
2	Inv_bill_details	Int(15)	Foreign Key	Inventory Bill ID
3	Details	Text		Details of Purchased item
4	Date	Date		Date of purchase
5	Inventory_id	Int(15)	Primary Key	Inventory ID

- **Category**

Table Number: 5.9

Table Name: Category				**Primary Key: category_id**
Description: Categories and it contains 4 fields				
Slno	Field Name	Data Type	Constraints	Description
1	Name	Varchar(20)		Category Names
2	Description	Text		Its details
3	Status	Tinyint(1)		Status Of Category
4	Category_id	int(15)	Primary key	Category ID

- **Promo**

Table Number: 5.10

Table Name: Promo				**Primary Key: promo_id**
Description: Promo Code and it contains 4 fields				
Slno	Field Name	Data Type	Constraints	Description
1	Promo_id	Int(15)	Primary Key	Promo ID
2	Code	Varchar(20)		Code for discounts
3	Discount	Smallint(2)		Discounts
4	Status	Varchar(20)		Status of Promo Code

- **Customer_Purchase**

Table Number: 5.11

Table Name: Customer_Purchase				**Primary Key: purchase_id**
Description: Customer Purchse details and it contains 10 fields				
Slno	Field Name	Data Type	Constraints	Description
1	Purchase_id	Int(15)	Primary Key	Purchase ID
2	cust_id	Int(15)	ForeignKey	Customer ID
3	Product_id	Int(15)	ForeignKey	Product ID
4	Quantity	Smallint(20)		Number of items
5	Status	Tinyint(1)		Status Of purchase
6	Order date	Timestamp		Ordered date
7	Delivery date	Date		Date of delivery
8	Price	Int(8)		Total amount
9	Bill_Id	int(15)	ForeignKey	Bill ID
10	Discount	varchar(20)		Discounts

5.3 INPUT DESIGN

Input design is the method by which valid data are accepted from the user. This part of the designing requires very careful attention. If the data going into the system is incorrect then the processing and output will magnify these errors. Inaccurate input data are the most common cause of errors in data processing. Input design consists of the following processes:-

- Designing graphical user entry screen is easy to use. Designing procedures and functions to valid the data as per business rules.
- Designing functions needed to store data into a usable form for processing.
- Designing the common integrated functions that can be used by all other users when needed.

5.4 OUTPUT DESIGN

Output design is one of the most important features of the information system. When the output is not of good quality, the users will be averse to use the newly designed system and may not use the system. There are many types of outputs, all of which can be either highly useful or can be critical to the users, depending on the manner and degree to which they are used.

Outputs from computer system are required primarily to communicate the results of processing to users. They are also used to provide a permanent hard copy of the results for later consultation.

Table Number: 5.10

Process	**Input design**	**Output design**
Login Page for Manager	Enter user name, Password	Show home page
Customer Registration	Enter Customer details	If valid user, Registration successful.
Eyesight Details	Upload prescription,	Successfully added
Add Product	Enter product details	Product added successfully
Create Categories	Enter Categories details	Categories created successfully
Search products	Select Categories and click product	Show product page and details
Add promo code	Enter Specific promo Code	Discount Applied
Experience Center	Viewing Varieties of Opticals	Viewing Successfully

5.5 PROGRAM DESIGN

i. Manager

Step 1: Start

Step 2: Once logged in the Manager has the privilege to manage products, billing, enquiry, inventory, documents and notice.

Step 3: In product function manager can search, view product details and also can edit customer details.

Step 4: In products,categories, inventory function manger can add/edit/block reception and can view staffs.

Step 5: Manager can also add, update, and delete notice.

Step 6: Manager can also add, update, and delete documents.

Step 7: Stop

ii. Customer

Step 1: Start

Step 2: After register the main functionalities are manage profile detail like adding photos,personal details,address, view categories, view products , book products, Experience the optical, add product, billing.

Step 3: In manage customer, customer can buy products, can cart products, search products, add bulk products, view/edit cart and also can give phone, email for updates.

Step 4: categories can also view prod\ details.

Step 5: product can add, view and modify daily accounts.

Step 6: product can add, view expense.

Step 7: billing can also be done.

Step 8: Stop

CHAPTER 6

6. FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

6.1 FUNCTIONAL REQUIREMENTS

• Manager should login with his credentials provided by admin for doing any activity

• Each customer should register with this application for auto identification. A store manager will register each customer with their details and sample photos for face identification

• For stock update, each product and vendor should be registered vendor is who supplies products to ship

6.2 NON-FUNCTIONAL REQUIREMENTS

• Availability Requirements – 24/7

• Capacity Requirements – initially expect a customer volume of 1000 customers per day

• Performance Requirements – since it's run face recognition and some machine learning operations it needs good hardware with high processing capability

• Reliability Requirements - need round the clock service.

• Security Requirements – managers who authorized by the admin and users who wish to use experience kiosk can use the software

CHAPTER 7

7.TESTING

7.0 SYSTEM TESTING

7.1 Introduction

In any software development, testing is a process to show the correctness of the program and it meets the design specifications. Testing is needed to prove correctness, to show completeness, to improve the quality of the software and to provide the maintenance aid. Some testing standards are therefore necessary to ensure completeness of testing, improve the quality of the software, and reduce the testing costs and to reduce study needs and operation time. Testing software extends throughout the coding phase and it represents the ultimate review of configurations, design and coding. A series of test cases are created that are intended to demolish the software that has been built.

Based on the way the software reacts to these tests, we can decide whether the configuration that has been built is study or not. It is essential that all components of an application be tested, as the failure to do so many result in a series of bugs after the software is put to use. Several methods of testing exist in software Engineering, which enable a programmer to make sure that the configuration built is free of bugs.

7.2 TESTING PROCESS

For any software that is newly developed, first and foremost preference is given to the testing of the system. It is developer‘s last chance to detect and correct the errors. That may occur possibly in the software. The programmers will generate a set of test data, which will give the maximum possibility of finding all most all types of errors that can occur in the system.

7.2.1 UNIT TESTING

The primary goal of unit testing is to take the smallest piece of testable software in the application, isolate it from the remainder of the code, and determine whether it behaves exactly as you expect. Each unit is tested separately before integrating them into modules to

test the interfaces between the modules. Unit testing has proven its value in that a large percentage of defects are identified during its use.

The most common approach to unit testing requires drivers and stubs to be written. The driver simulates a calling unit and the stub simulates a called unit. The investment of developer time in this activity sometimes results in demoting unit testing to a lower level of priority and that is almost always a mistake. Even though the drivers and stubs cost time and money, unit testing provides some undeniable advantages. It allows for automation of the testing process, reduces difficulties of discovering errors contained in more complex pieces of the application, and test coverage is often enhanced because attention is given to each unit.

7.2.2 INTEGRATION TESTING

Integration testing (sometimes called Integration and Testing, abbreviated as ―I&T‖) is the phase in software testing in which individual software modules are combined and tested as a group. It occurs after unit testing and before system testing. Integration testing takes place as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those aggregates, and delivers as its output the integrated system ready for system testing.

7.2.3 VALIDATION TESTING

Data validation is the process of testing the accuracy of data. A set of rule we can apply to a control to specify the type and range of data that can enter. It can be used to display error alert when users enter incorrect values in to a form.

Now performing validation testing in system Centralized Social Welfare by undergoing validation for each tools and the validation succeeded when the software function in a manner that can be reasonably accepted, by the use

The purpose of integration testing is to verify functional, performance, and reliability requirements placed on major design items. These ―design items‖ i .e. assemblages (or groups of units) are exercised through their interfaces using Black box testing, success and error cases being simulated via appropriate parameter and data inputs. Simulated usage of shared data areas and inter-process communication is tested and individual subsystems are exercised through their input interface. Test cases are constructed to test that all components within assemblages interact correctly, for example across procedure calls or process activations, and

this is done after testing individual modules, i.e. unit testing. The overall idea is a ―building block‖ approach, in which verified assemblages are added to a verified base which is then used to support the integration testing of further assemblages.

7.2.4 USER ACCEPTANCE TESTING

User acceptance of a system is a key factor for the success of any system. The system under consideration is tested for the user acceptance by constantly, keeping in touch with the prospective system user at the time of developing and making changes whenever required.

7.3 TESTING STRATEGIES

7.3.1. TOP-DOWN TESTING

Top-Down Testing tests the higher levels of a system before testing its detailed components. The program is represented as a single abstract component with sub components represented by stubs. Stubs have the same interface as the components but very limits functionally. After the top-level component has been tested, its sub-components are implemented and tested in the same way. This process continues recursively until the bottom-level components are implemented. The whole system may then be completely tested.

7.3.2. BOTTOM-UP TESTING

Bottom-Up Testing is the converse of Top-Down Testing. It involves testing the modules at the lower levels of the hierarchy and then working up the hierarchy of the modules until the final module is tested. The advantage of bottom-up testing is the disadvantage of top-down testing and vice versa. When using bottom-up testing test drivers must be written to exercise the lower level components. These test drivers simulate the components environment and are valuable components; the test drivers and test data should be distributed with the component. Potential re-users can then run these tests to satisfy themselves that the component behaves as expected in their environment.

7.3.3. BLACK BOX TESTING

Knowing the specified function that a product has been designed to perform, test can be conducted that demonstrates each function that is fully operational, at the same time searching for errors in each function. Black Box testing focuses on functional requirement of the software. Black Box testing attempts to find out errors in the following categories.

- Incorrect or missing functions
- Interface errors
- Errors in data structures or external database access.
- Performance and errors
- Initialization and termination errors

7.3.4. WHITE BOX TESTING

Knowing the internal working of a product test can be conducted to ensure that ―all gears mesh‖ that is internal operation performs according to specification and all internal components have been adequately exercised. Using white box testing methods, the software engineer can derive test cases that

 Guarantee that all independent paths within a module have been exercised at least once basis path testing.

- Exercise all logical decisions on their true and false sides- Condition testing.
- Execute all loops at their boundaries and within their operation bounds- Loop testing.
- Exercise internal data structures to assure their validity-data flow testing.

7.4 TEST CASES

Test cases are the key to the process because they identify and communicate the conditions that will be implemented in test and are necessary to verify successful and acceptable implementation of the product requirement. They are all about making sure that the product fulfils the requirements of the system

7.5 TESTING RESULTS

- Manager Login

Table Number: 7.1

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/ Fail
1	Check manager Login with valid Data	Go to site Enter User Id Enter Password Click Submit	Username= admin Password = admin123	Manager should Login into application	As expected	pass
2	Check manager Login with invalid Data	Go to site Enter User Id Enter Password Click Submit	Username=user Password = 13523	Manager login failed into application	As expected	pass
3	Check manager Login with valid username and invalid password	Go to site Enter User Id Enter Password Click Submit	Username= admin Password= 13523	Manager login failed into application	As expected	pass
4	Check manager Login with invalid	Go to site Enter User Id Enter Password Click Submit	Username=ava Password= Admin123	Manager login failed into application	As expected	pass

	username and valid password					

- Add Customer

Table Number: 7.2

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/ Fail
1	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856234571, Address= address sample, Take photo=i.jpg	Customer added successfully	As expected	pass
2	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user, phone=9856234571, Address= address sample,	Customer adding failed	As expected	pass

			Take photo=i.jpg			
3	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856231, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
4	Check add employee with valid details for name, email, phone, region, role and invalid address	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856231, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
5	Check add Customer with valid details for name, email,	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com,	Customer adding failed	As expected	pass

	phone, address, Take Photo		phone=9856231, Address= address sample, Take photo=i.jpg			
6	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856231, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
7	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name=, email=, phone=, Address=, Take photo=i.jpg	Customer adding failed	As expected	pass
8	Check add Customer with valid details for	Go to site Enter name, email, phone, address,	Name=, email=user@xyz.com,	Customer adding failed	As expected	pass

	name, email, phone, address, Take Photo	Take Photo and click add	phone=9856234571, Address= address sample, Take photo=i.jpg			
9	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=, phone=9856234571, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
10	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
11	Check add Customer with valid details for	Go to site Enter name, email, phone, address,	Name= user, email=user@xyz.com,	Customer adding failed	As expected	pass

	name, email, phone, address, Take Photo	Take Photo and click add	phone=9856234571, Address=, Take photo=i.jpg			
12	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856234571, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass
13	Check add Customer with valid details for name, email, phone, address, Take Photo	Go to site Enter name, email, phone, address, Take Photo and click add	Name= user, email=user@xyz.com, phone=9856234571, Address= address sample, Take photo=i.jpg	Customer adding failed	As expected	pass

- Add Product

Table Number: 7.3

Test Case ID	Test Scenario	Test Steps	Test Data	Expected Results	Actual Results	Pass/ Fail
1	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=23000, price=25000, tax in %=15, quantity =25,description =anti, status=active	Product added successfully	As expected	pass
2	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %,	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=, price=25000, tax in %=15, quantity	Product adding failed	As expected	pass

	Quantity ,Description, Status		=25,description=anti, status=active			
3	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=23000, price=25000, tax in %=, quantity =25,description=anti, status=active	Product adding failed	As expected	pass
4	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=, price=25000, tax in %=15, quantity =25,description=anti, status=active	Product adding failed	As expected	pass

5	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=, price=25000, tax in %=15, quantity =,description=anti, status=active	Product adding failed	As expected	pass
6	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=, Category=sunglass,selling rate=23000, price=25000, tax in %=15, quantity =25,description=anti, status=active	Product adding failed	As expected	pass
7	Check add Customer with valid details for name,	Go to site Enter name, Category,Selling rate,price details, Tax in %,	Name=rayban, Category=,selling rate=23000, price=25000,	Product adding failed	As expected	pass

	Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Quantity ,Description, Status	tax in %=15, quantity =25,description =anti, status=active			
8	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=,selling rate=, price=, tax in %=15, quantity =25,description =anti, status=active	Product adding failed	As expected	pass
9	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=, Category=,selling rate=23000, price=25000, tax in %=15, quantity =25,description =anti, status=active	Product adding failed	As expected	pass

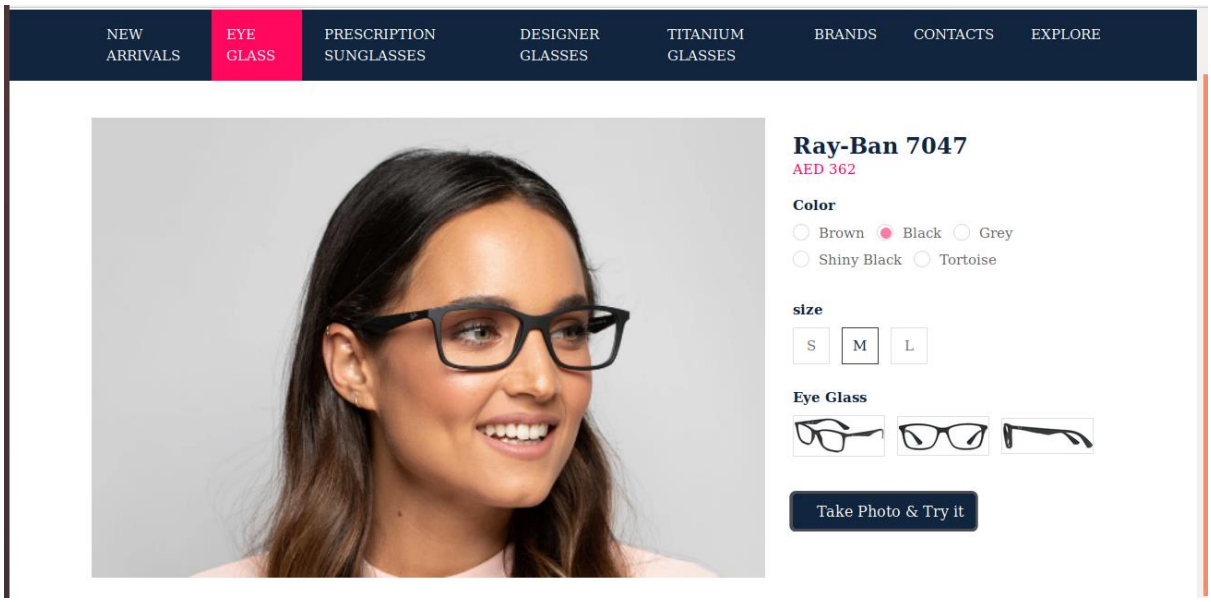
10	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=sunglass,selling rate=23000, price=, tax in %=15, quantity =25,description =anti, status=active	Product adding failed	As expected	pass
11	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=rayban, Category=,selling rate=23000, price=25000, tax in %=15, quantity =25,description =anti, status=active	Product adding failed	As expected	pass
12	Check add Customer with valid details for name, Category,Selling	Go to site Enter name, Category,Selling rate,price details, Tax in %,	Name=rayban, Category=sunglass,selling rate=23000, price=25000,	Product adding failed	As expected	pass

	rate,price, Tax in %, Quantity ,Description, Status	Quantity ,Description, Status	tax in %=15, quantity = ,description=anti, status=active			
13	Check add Customer with valid details for name, Category,Selling rate,price, Tax in %, Quantity ,Description, Status	Go to site Enter name, Category,Selling rate,price details, Tax in %, Quantity ,Description, Status	Name=, Category=, selling rate=, price=, tax in %=, quantity =,description=anti, status=active	Product adding failed	As expected	pass

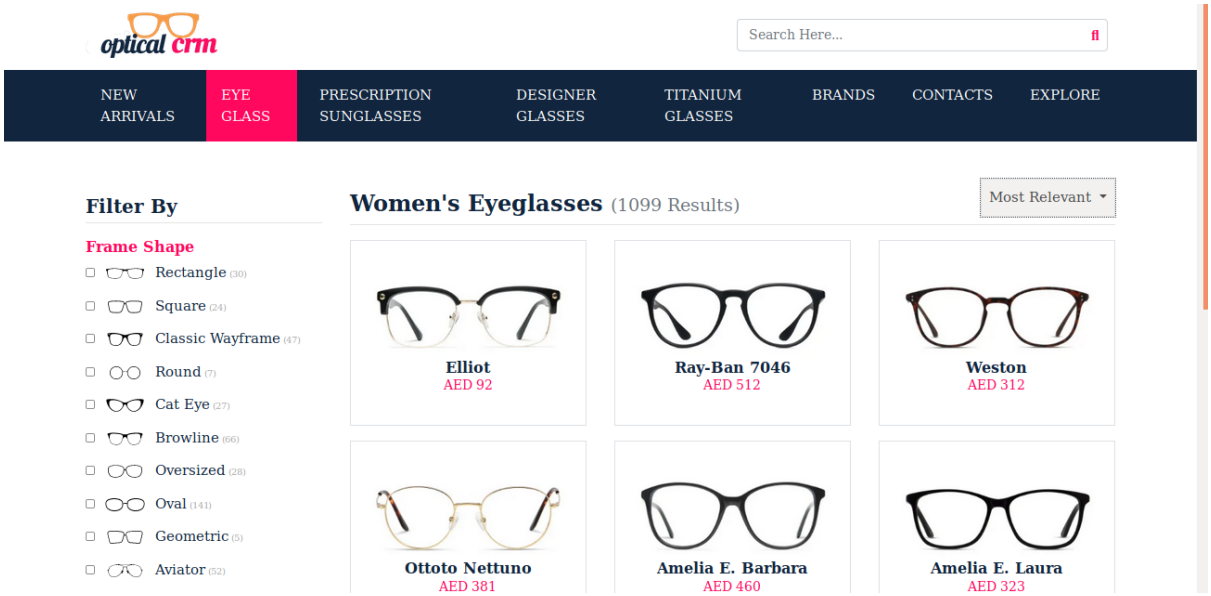
CHAPTER 8

8. SCREEN SHOTS

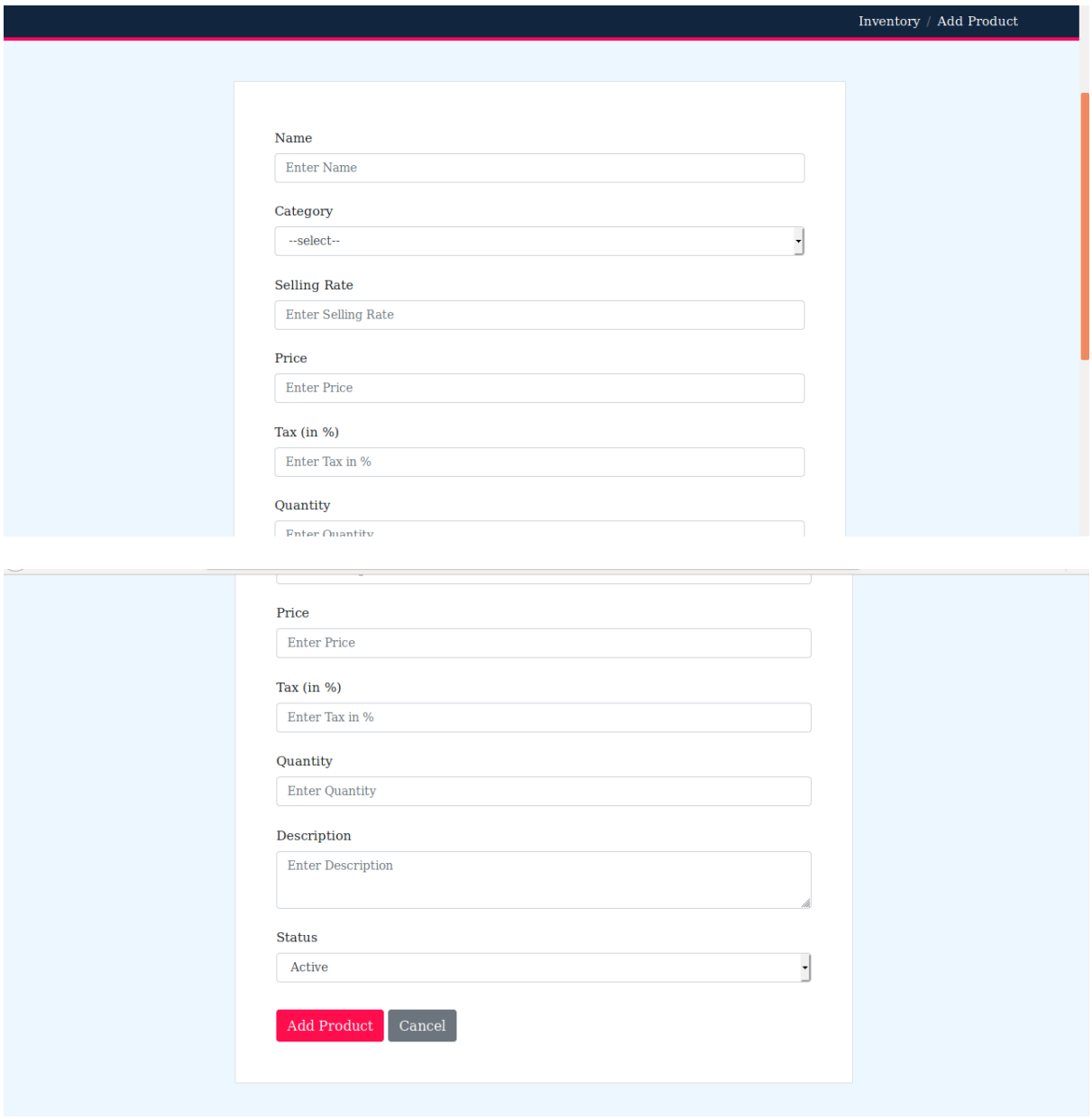
I. FACE-RECOGNIZED-PRODUCT VISUALISATION



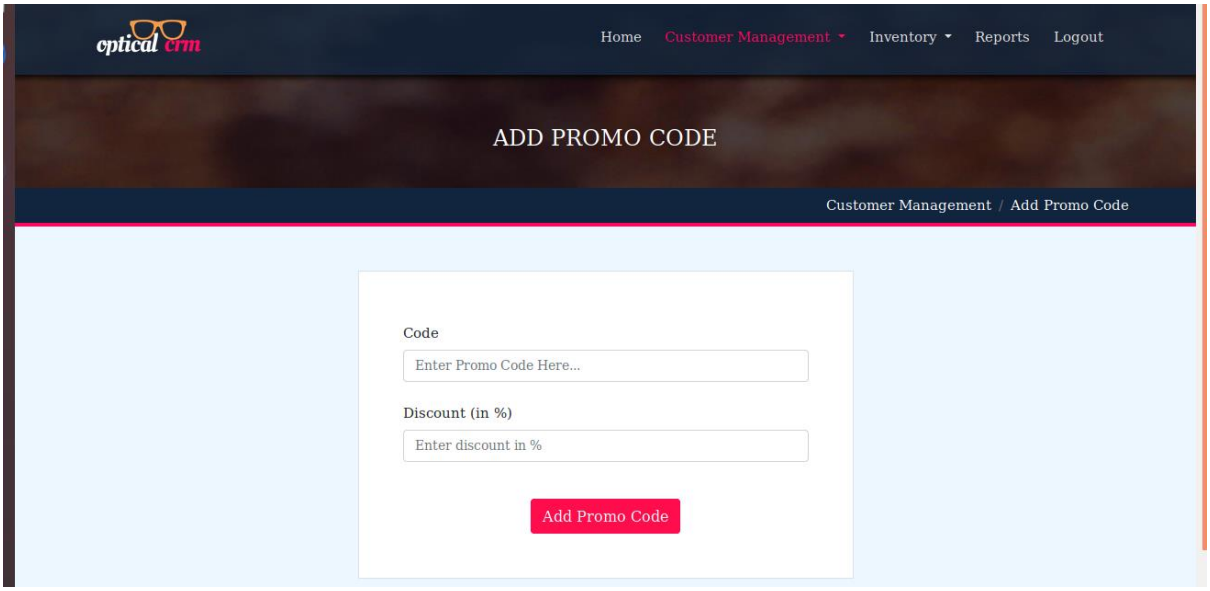
II. EXPERIENCE-CENTER



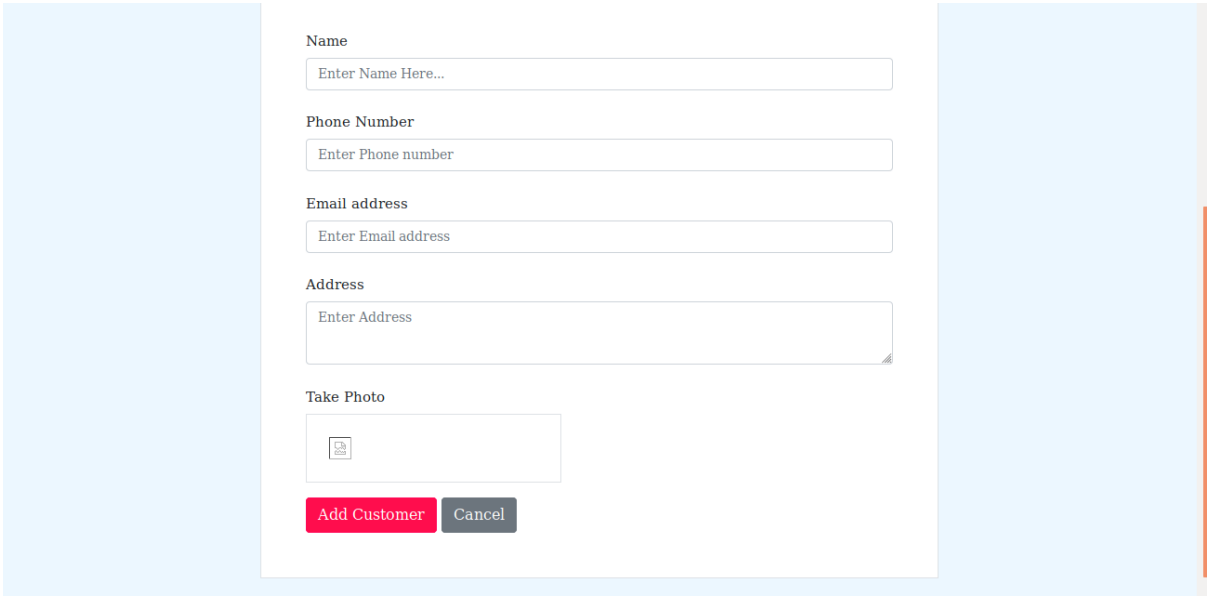
III. ADDPRODUCT-1



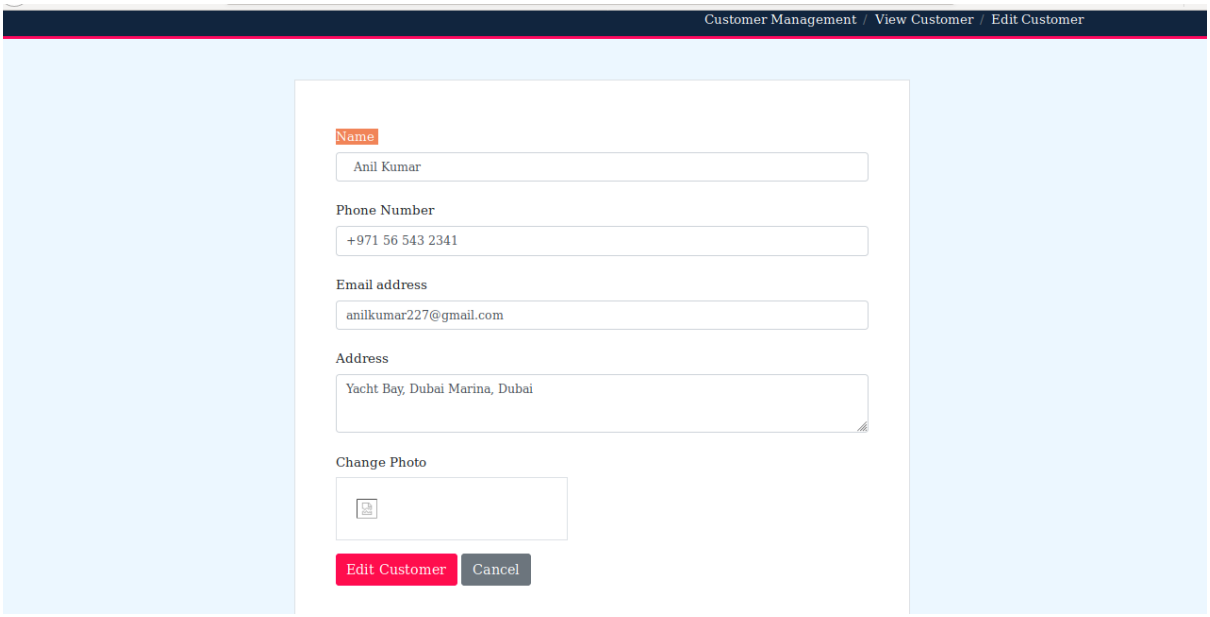
IV. ADD-PROMOCODE



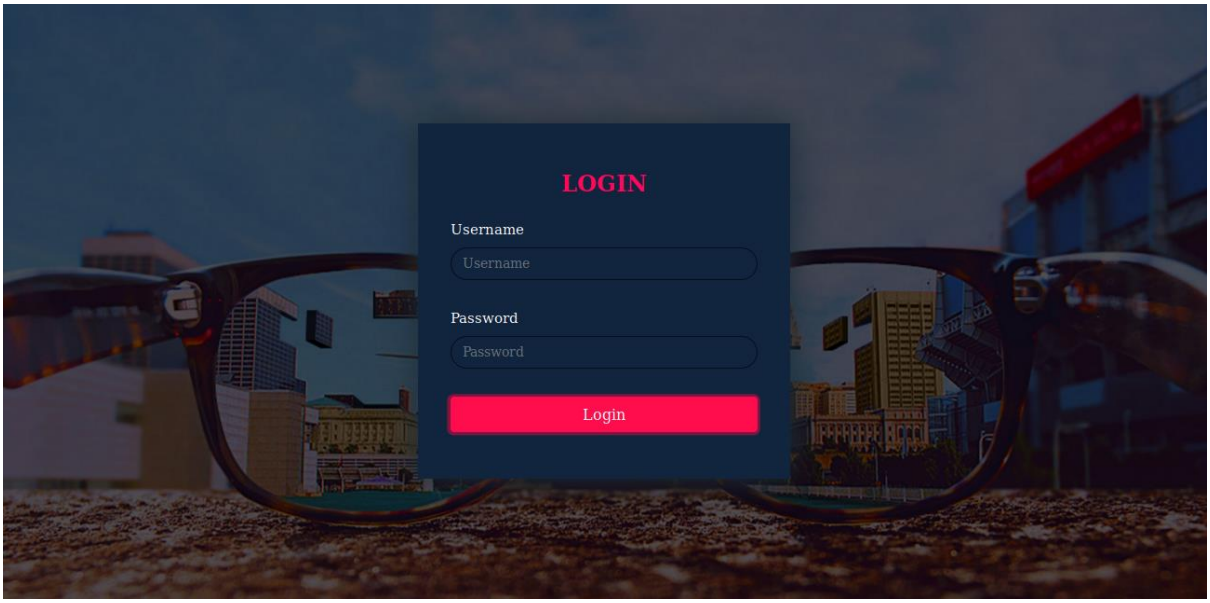
V. ADD-CUSTOMER



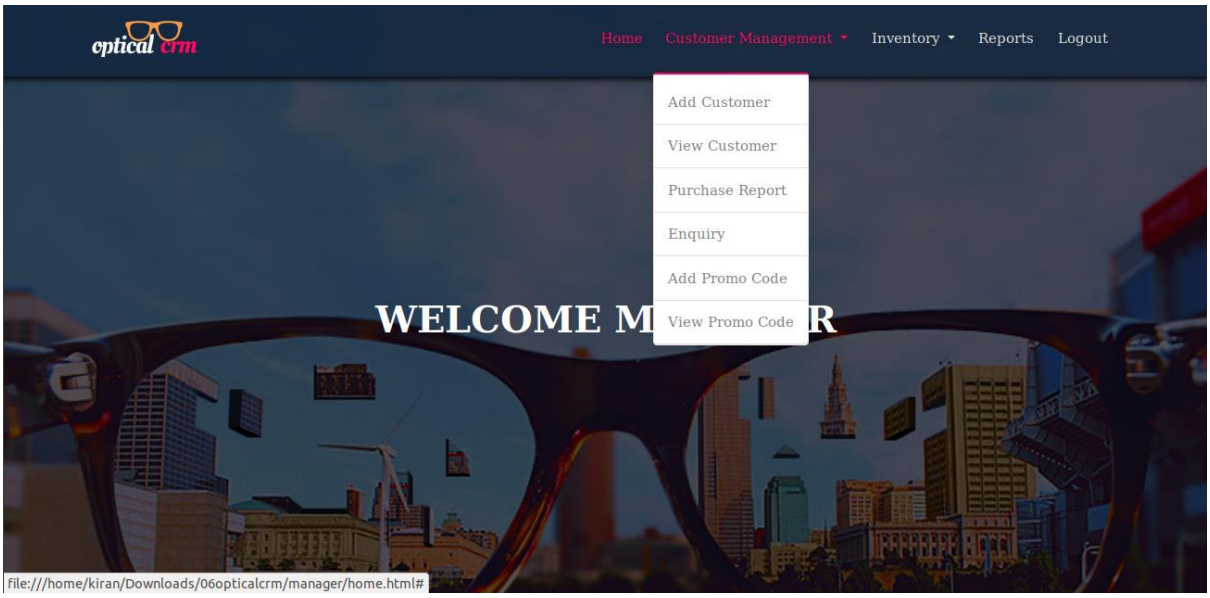
VI. EDIT-CUSTOMER



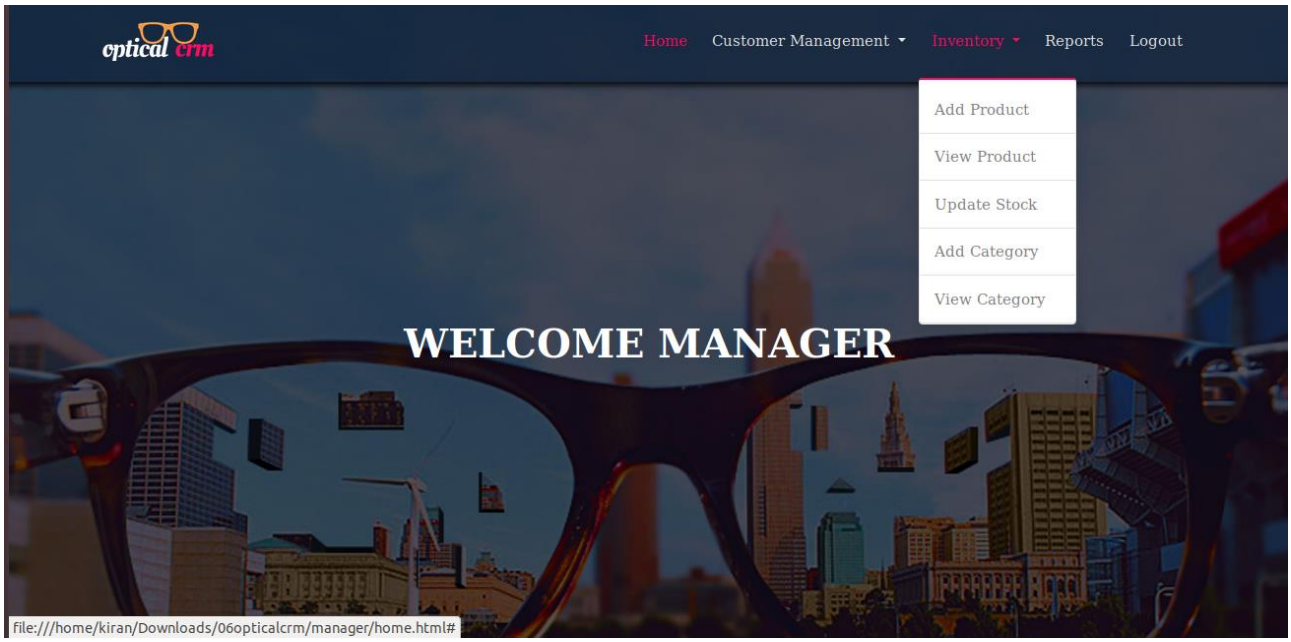
VII. MANAGER-HOME



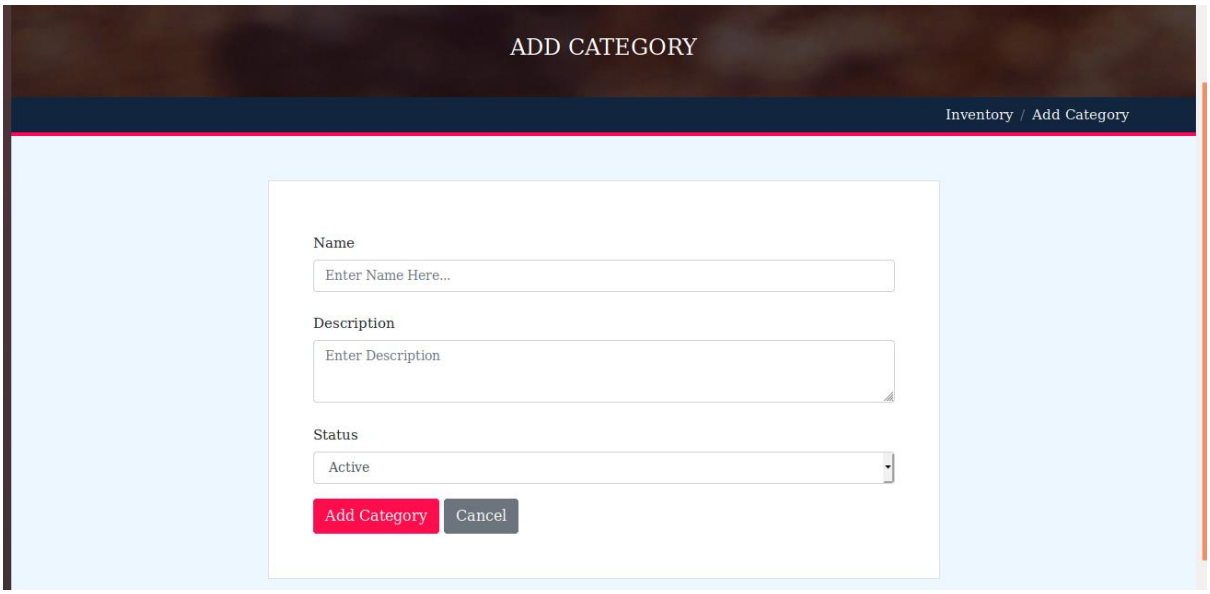
VIII. MANAGER-HOME-1



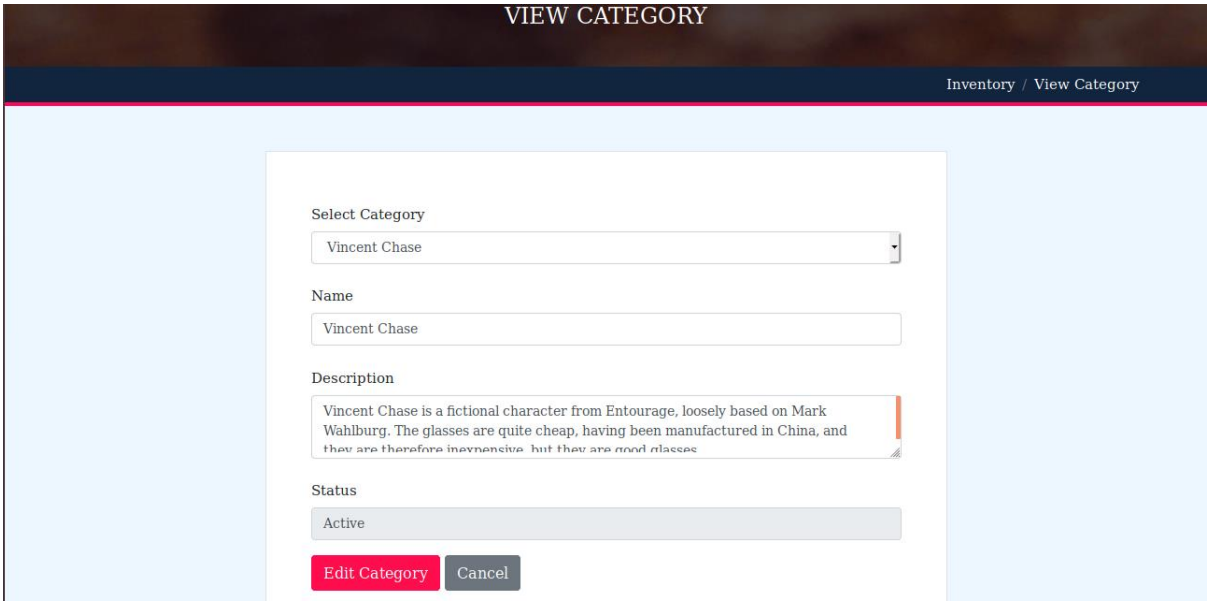
IX. MANAGER-HOME-2



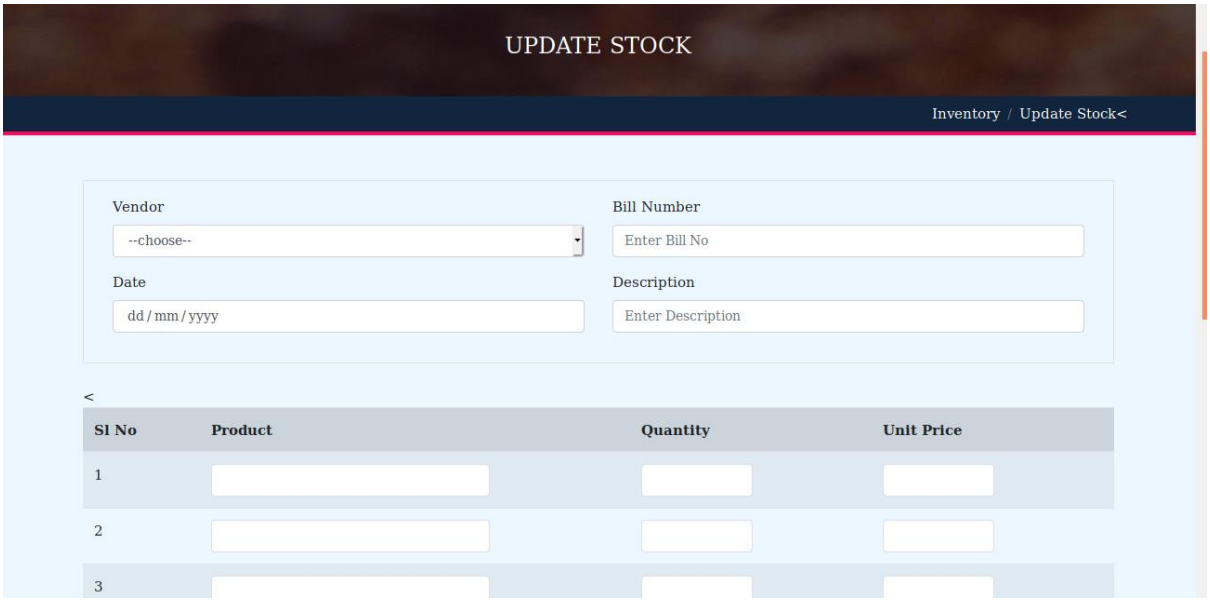
X. ADD CATEGORY



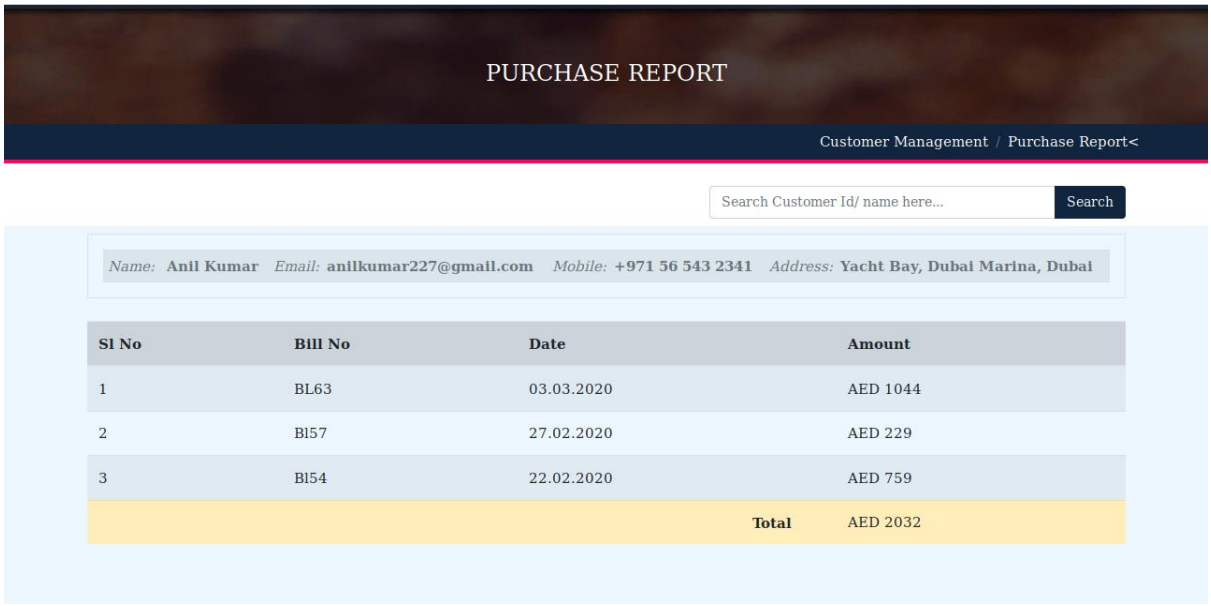
XI. VIEW-CATEGORY



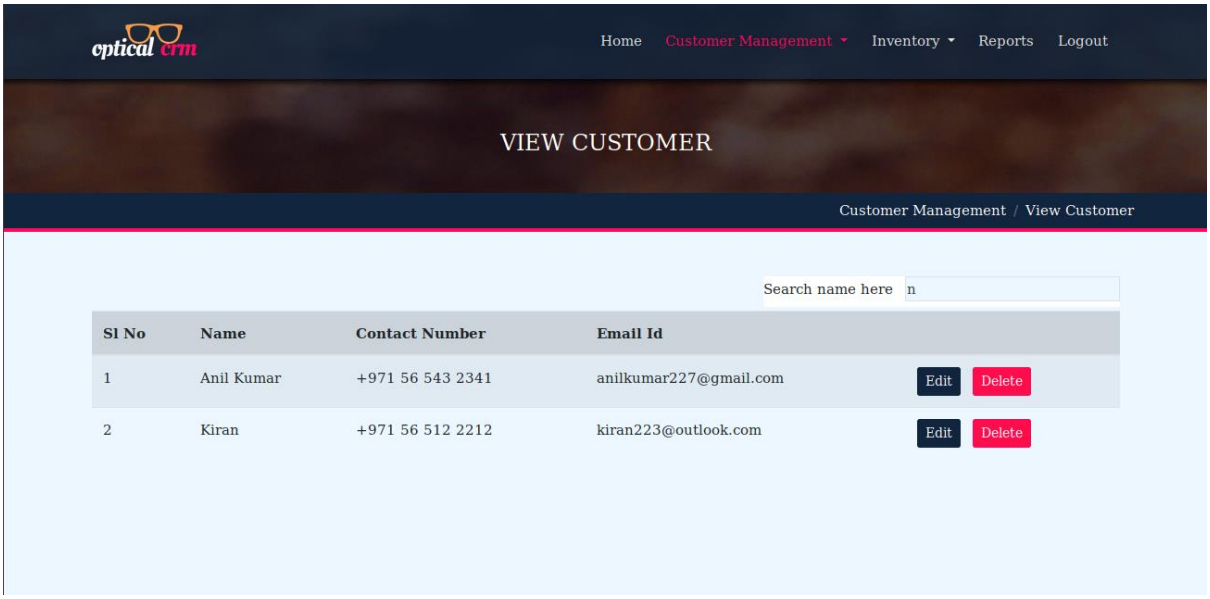
XII. UPDATE STOCK



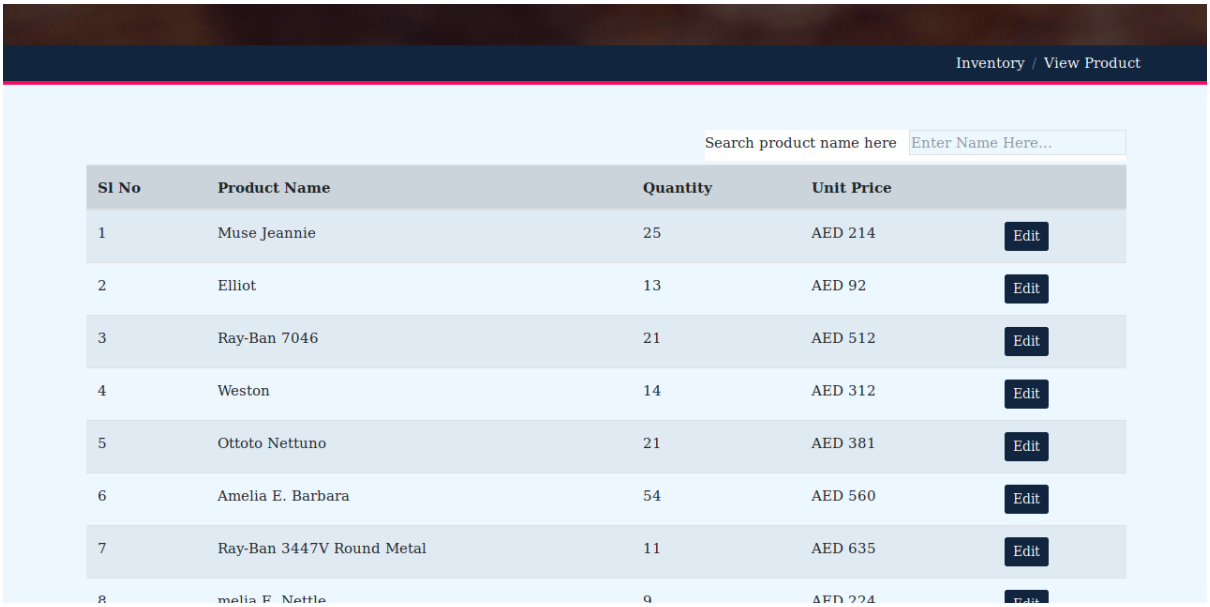
XIII. PURCHASE-REPORT



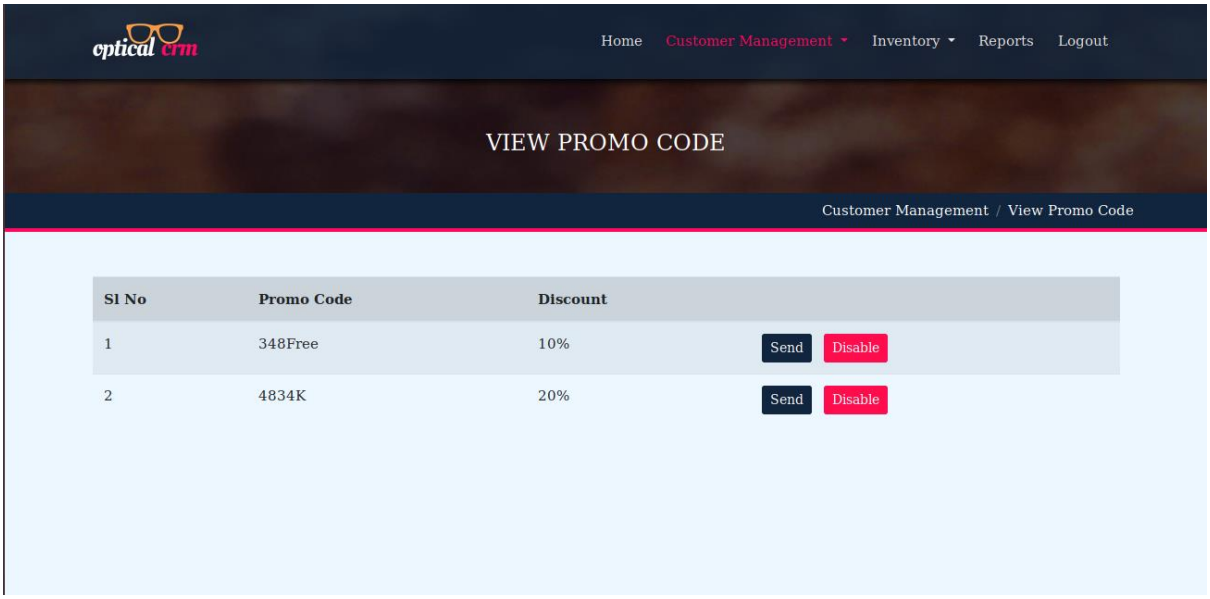
XIV. VIEW-CUSTOMER



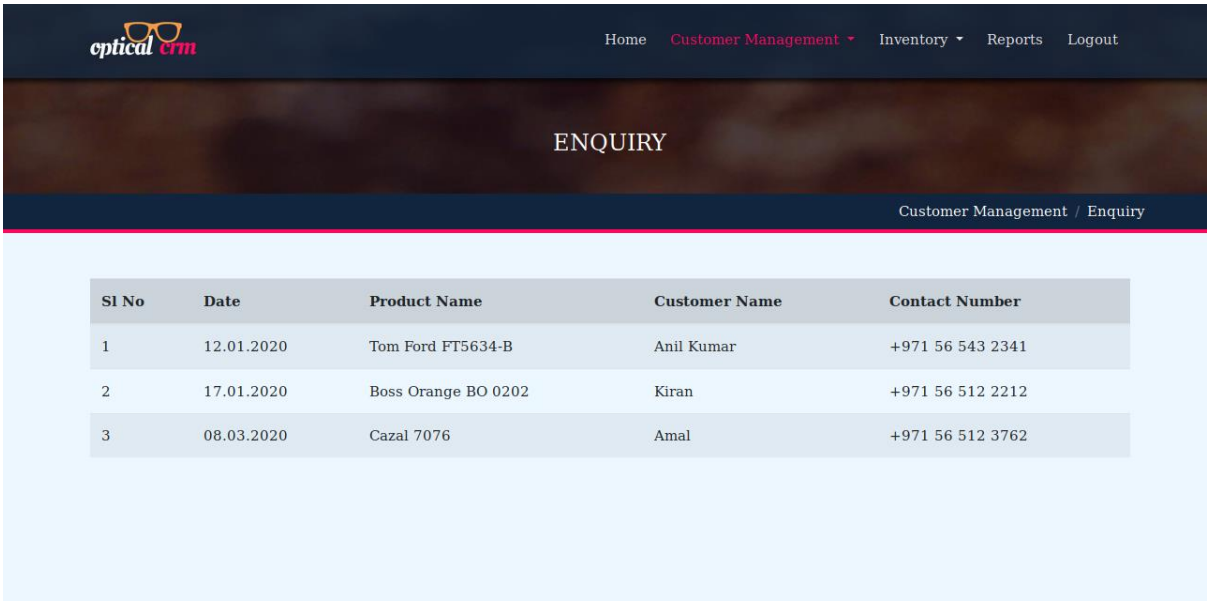
XV. VIEW-PRODUCTS



XVI. VIEW PROMO CODE



XVII. PRODUCT-ENQUIRY

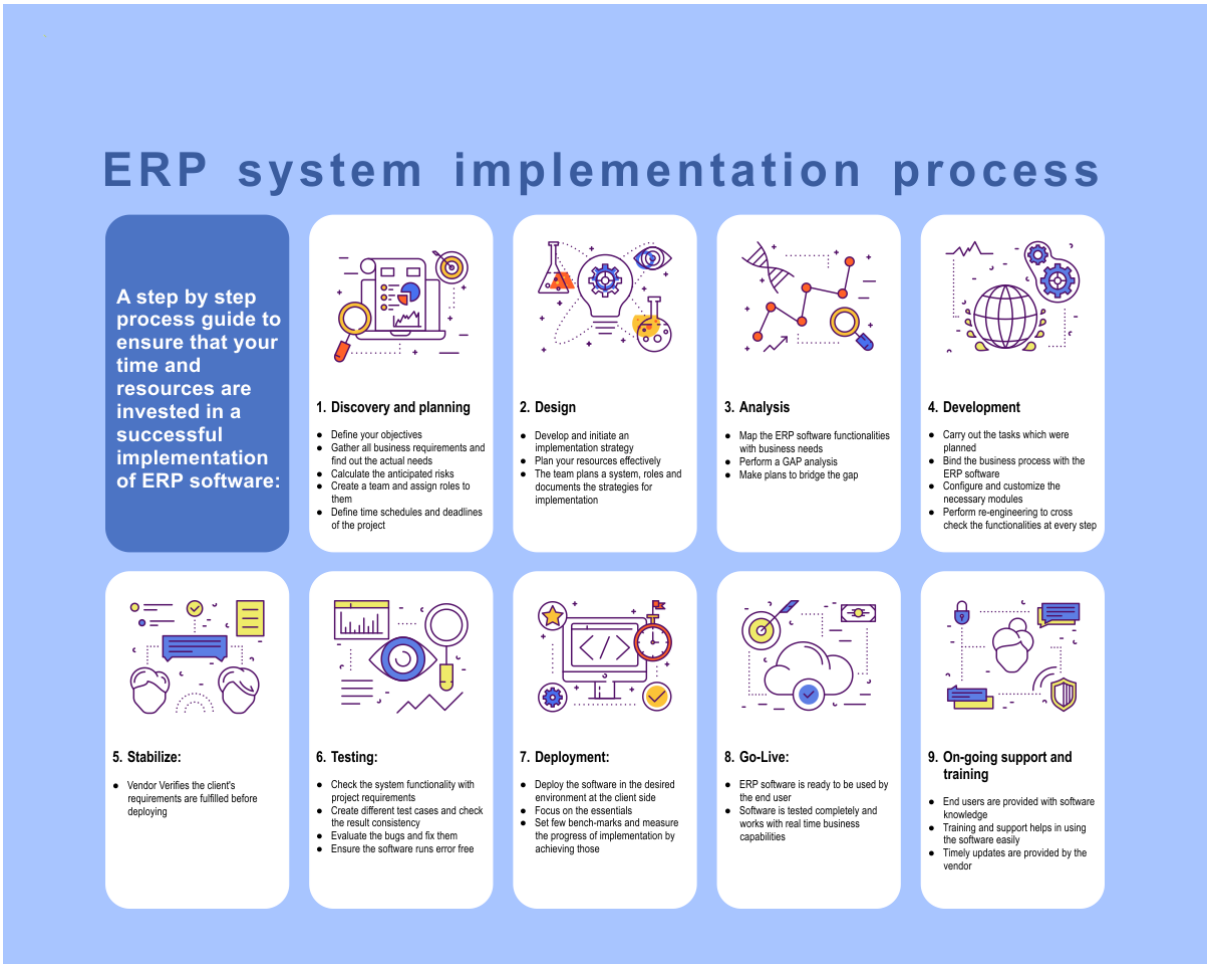


CHAPTER 9

9. CONCLUSION

9.1 System Implementation

Here's a list of ERP Implementation steps that is sure to soar your chances of success. Follow them to ensure that your ERP implementation process is not an intimidating one.



The final and important phase in the system life cycle is the implementation of the new system. The term implementation has different meanings ranging from the conversion of a basic application to a complete replacement of a computer system. The procedure however, is virtually the same. Implementation includes all those activities that take place to convert from old system to new. The new system may be totally new replacing existing system, manual or automated, or it may be a major modification to an existing system.

The method of implementation and time scale to be adopted is found out initially. Next the system is tested properly and at the same time users are trained in the new procedure.

Proper implementation is essential to provide a reliable system to meet organization requirements. Successful implementation may not guarantee improvement in the organization using the new system, but it will prevent improper installation.

The implementation involves following things:

- Careful planning.
- Investigation of the system considerations.
- Design the method to achieve the changeover.
- Evaluation of change over method.

Implementation of a new system requires the operating staff installing the software and creating computer files. There are many ways in which this can be achieved. The most common methods are the following.

- Direct change over
- Parallel running
- Pilot running change over The creation of the designed system takes place in the implementation phase.

This phase activities do the following:

- Development of phase overview
- Preparing for implementation
- Computer program development
- Development phase report and overview

It also performs activities like writing, testing, debugging and documenting the programs.

There are three types of implementations:

- Implementation of a computer system to replace a manual system. The problems encountered are converting files, training users, creating accurate files and verifying printouts for integrity.
- Implementation of a new computer system to replace an existing one. This is usually a difficult conversion. If not properly planned, there can be many problems. Some large computer systems have taken as long as a year to convert.
- Implementation of a modified application to replace the existing one, using the same computer. This type of conversion is relatively easy to handle, provided there are no major changes in the files. Every system requires periodic evaluation after implementation.

This is to review the performance of the system and to evaluate against established standard or criteria. A study is conducted for measuring the performance of the system against pre-defined requirements. This study results a post-implementation review that determines how well the system continues to meet the performance specification.

9.2 CONCLUSION

When testing the last prototype we got findings suggesting that the participants did not have a Problem with getting information from the system. The customer feedback about virtual experience they got was very good, this could be supported by the fact that the system provided a source for the Information it gave. It has been interesting to investigate how the participants interacted with the Optical CRM system and how they reported on it afterwards. Our findings have some indicators leading towards that can help you in managing your inventory, purchases, sales and customer database very efficiently and easily.

9.3 FUTURE ENHANCEMENT

Over the last 30+ years in the eyecare industry, there have been many “trends” that eyecare professionals have ignored thinking “it won’t effect” them. Think about: 1-800CONTACTS, Big Box Optical, Wal-Mart, One Hour Glasses, Online Optical, and Warby Parker. Each of those brought major changes to the optical industry and many eyecare providers were not listening and adapting to new paradigms.

Smart Glasses/AR is another big trend in the optical market. If you think you have a problem with online shoppers now, it will only get worse as the technology and the “coolness” of AR integrates into the shopping mainstream. Add in the ease of payment with programs like Apple Pay and Google Wallet, and you can see the threat this poses.

In the past, AR glasses have been for gamers. In today’s age, you can do almost anything with AR and it’s compatible glasses. Things like trying on clothes, decorating/building houses, designing products, visiting museums and parks, taking a hike, or going on a trip all from the comfort of home. As technology evolves and makes AR relevant it will change the way we live our lives. Web stores will embrace 3D as a shopping experience, making it easier to browse and shop. Brick and mortar locations will most likely, in order to compete, have to embrace this technology. But there are cons to the technology, which can give you the advantage you need to fight back against these well-funded tech innovations.

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   - https://www.tutorialspoint.com/python/index.html
   - https://www.tutorialspoint.com/mysql/mysql-introduction.html
   - https://www.tutorialspoint.com/django/django_creating_project.html

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