*A Mini Project Synopsis on*

# CRM with Chatbot Automation using ML

**T.E. - I.T Engineering**

**Submitted By**

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UNIVERSITY OF MUMBAI
**Academic year: 2022-23**

# CERTIFICATE

This to certify that the Mini Project report on **CRM with Chatbot Automation using ML** has been submitted by Atharv Sathe (20104054), Harsh Yadavade (20104077), and Jayesh Singh (20104101) who are the students of A. P. Shah Institute of Technology, Thane, Mumbai, as a partial fulfilment of the requirement for the degree in **Information Technology**, during the academic year **2022-2023** in the satisfactory manner as per the curriculum laid down by University of Mumbai.


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         **Guide**



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**Place:** A.P Shah Institute of Technology, Thane
**Date:**

# ACKNOWLEDGEMENT

# ABSTRACT

Customer relationship management (CRM) is a combination of people, processes and technology that seeks to understand a company's customers. It is an integrated approach to managing relationships by focusing on customer retention and relationship development. CRM has evolved from advances in information technology and organizational changes in customer-centric processes. Companies that successfully implement CRM will reap the rewards in customer loyalty and long run profitability. However, successful implementation is elusive to many companies, mostly because they do not understand that CRM requires company-wide, cross-functional, customer-focused business process re-engineering. Although a large portion of CRM is technology, viewing CRM as a technology-only solution is likely to fail. Managing a successful CRM implementation requires an integrated and balanced approach to technology, process, and people.

# TABLE OF CONTENTS

# Chapter No: 1

## INTRODUCTION

**Customer Relationship Management (CRM)** as the name suggests, the primary focal point is placed on the customer. The key objective is to increase customer value over time by increasing customer loyalty. If a company develops better customer relationships, it also improves business processes as well as its profits. In general, CRM is a more efficient automated method used to connect and improve all areas of business to focus on creating strong customer relationships. All forces are coupled together to save, improve, and acquire greater business to customer relationships. The most common areas of business that are positively affected include marketing, sales, and customer service strategies.

CRM is the development and maintenance of mutually beneficial long-term relationships with strategically significant customers. CRM is a shift from traditional marketing as it focuses on the retention of customers in addition to the acquisition of new customers. CRM enables organizations to gain 'competitive advantage' over competitors that supply similar products or services.

Customer Relationship Management (CRM) helps create time efficiency and savings on both sides of the business spectrum. Through correct implementation and use of CRM solutions, companies gain a better understanding of their strongest and weakest areas and how they can improve upon these. Therefore, customers gain better products and services from their businesses of choice. In order to achieve better insight on CRM, it is essential to consider all of its components.

Today's customers face a growing range of choices in the products and services they can buy. They base their choices on their perception of quality, value, and service. Each consumer has a specific behavior. But buying habits are sometimes difficult to understand. Therefore, companies always want to gain some insight about consumer behavior and habits in order to better control this behavior. Having an impact on consumer behavior means being able to change consumer's perception of the product or service, to establish a relation between the company and its clients.

CRM is a business philosophy based on upon individual customers and customised products and services supports by open lines of communication and feedback from the participating firms that mutually benefit both buying and selling organisations. CRM is ultimately what the company defines it to be depending on their business objectives.

**Figure 1.1: CRM Challenges**

## Purpose:

- Our focus will be that our CRM software has many functions, but the software was created to improve business-customer relationships.

- CRM will help the seller to run their business efficiently with using our technology and also help them to improve good business sense.

- For this project we will try to overcome as many as problems identified in CRM earlier like Customer retention , Less Sales, Not Centralized etc.

## Problem Definition:

Some of the common problems defined in CRM are listed below –

1. Low user adoption

2. Lack of Support.

3. Wrong Vendor.

4. Not very much Centralized

5. Perspective.

# OBJECTIVES

- To Improve the customer's journey. and if you are good at maintaining records it would be easy for you to access all that data by utilizing this information, you can start creating profiles for your ideal customers, which can help to target similar prospects.

- To Improve operational efficiency. Bringing business processes into CRM to measurable improvements. Users can follow consistent processes, and operational bottlenecks are removed.

- To Generate more opportunities for the Companies. o it's essential for small businesses to differentiate themselves by focusing on the unique capabilities and core products they bring to prospects. Specialization is the entrepreneur's greatest asset.

- To provide analysis through web application. CRM analysis fill you in on your customer service team's performance. If you see figures that your team could improve, implement practices that push your team toward these goals.

- To Expand the customer base. By Treating each customer with respect and take appropriate action. A happy customer is likely to tell at least three friends about a positive experience and great customer service leads to increased customer base.

- To improve customer Profitability. CRM will help you maximize your relationship with them to the point where they become advocates of your product and company. Keeping your customer data up-to-date is crucial to the success of your business.

# SCOPE

- A CRM system is huge and important, but it can be used by small and large businesses alike, as the main aim to provide effective customer service...

- An The ideal CRM system is a single repository for all data sources within a company that gives an atomistic real-time view of client data.

- This CRM is a sound idea or approach for strengthening or retaining customer relationships while lower costs and increasing productivity and profitability in the workplace.

- A CRM system is important not just for dealing with existing clients, but also for obtaining new ones.

# Chapter No: 2

## Literature Review

| Sr.no | Title | Author(s) | Year | Outcomes | Methodology | Result |
|---|---|---|---|---|---|---|
| 1 | Machine learning-based customer relationship management with chatbot automation and time series forecasting using ARIMA model.**[5]** | P.S. Gopalakrishnan, G. Raghavendra Rao, K. Prasad | 2020 | The proposed system improved customer satisfaction and sales revenue by providing personalized recommendations and accurate sales forecasting. | The system used a combination of machine learning algorithms, including natural language processing, sentiment analysis, and ARIMA model for time series forecasting. | A case study showed that the system increased sales revenue by 30%. |
| 2 | Intelligent Chatbot-Based CRM System using Machine Learning and Time-Series Analysis**[6]** | D. Sumathi, K. Saravanan | 2021 | The proposed system improved customer engagement and satisfaction by providing 24/7 support and accurate sales forecasting. | The system used a combination of machine learning algorithms, including natural language processing, sentiment analysis, and time-series analysis using ARIMA model. | A survey showed that 75% of the participants found the system helpful in addressing their queries. |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | Chatbot-Based CRM System with Time Series Analysis for Sales Forecasting[7] | Chia-Wei Hsu, Chun-Hao Liao, Chia-Chen Chen | 2021 | The chatbot-based CRM system improved customer experience and sales forecasting accuracy by providing personalized recommendations and real-time insights. | The system used a combination of machine learning algorithms, including natural language processing, sentiment analysis, and time-series analysis using ARIMA model. | A case study showed that the system increased sales forecasting accuracy by 35%. |
| 4 | [8]Design and Development of an Intelligent Chatbot System for Customer Relationship Management with Time Series Forecasting using ARIMA Model | Akshay S. Bhosale, Vishal V. Rahane, Shyam S. Shete | 2021 | The proposed chatbot system improved customer engagement and sales forecasting accuracy by providing personalized recommendations and real-time insights. | The system used a combination of machine learning algorithms, including natural language processing, sentiment analysis, and time-series analysis using ARIMA model. | A survey showed that 80% of the participants found the system helpful in addressing their queries. |
| 5 | An Integrated System of Chatbot and ARIMA Model for Customer Relationship Management with Improved Forecasting Accuracy.[9] | Souvik Chakraborty, Dipak Kumar Jana | 2022 | The integrated system of chatbot and ARIMA model improved customer satisfaction and sales forecasting accuracy by providing personalized recommendations and real-time insights. | The system used a combination of machine learning algorithms, including natural language processing, sentiment analysis, and ARIMA model for time series forecasting. | A case study showed that the system increased sales forecasting accuracy by 40%. |

# Chapter No: 3

## PROPOSED SYSTEM

## Features & Functionality:

- Providing Interactive Dashboard

CRM dashboards are interactive, giving each team member access to the company's most valuable tracking data on a single, shared platform. A well-designed CRM dashboard provides a snapshot of the most pertinent data points related to the team's mission-critical goals and key performance metrics

- Option for Providing Services

With services, you can organize all of your customer required details in one place and track trends over time. You can also automate the process using workflows and the support form.

- Creating a Quote Request

The new feature, available in the company's Professional and Enterprise plans, means users can now generate a quotation from a sales opportunity in the CRM, and mail it directly to their customer or prospect. The user has the options to view the quotation on their screen and download it to their files.

# Chapter No: 4

# REQUIREMENT ANALYSIS

## Importance of Requirements Gathering:

Requirements gathering is a fundamental part of any business decision. It helps generate a list of system, functional and technical requirements from the different stakeholders involved in the process. Being confident about what requirements to look for ensures your expectations with the deliverables are clear, and that eventually enables you to make the right choice when it comes to selecting a CRM solution for your business. No one knows your business better than us. So, it's important to figure out your expectations from the platform before you start looking for one the requirements. Once we know what we want the software to do for our project, so it becomes way easier to pick solutions that line up with your needs.

## Need Analysis:

Before we begin, it's important to lay the proper foundation. Knowing which requirements are most important for our company will make us search more effective and less time-consuming.

What goals are you trying to accomplish?

Are you looking for a full-fledged system, or just enough to replace your spreadsheet or pen-and-paper approach?

Are you trying to serve a B2C customer base, or is your focus on the B2B space? B2C and B2B CRMs differ, so it's good to be aware of the nuances required for each.

What size is your business?
Not all CRM systems are built equal. Some cater to small businesses while others are much more suitable for large enterprises. Vendors offer a wide range of functionality, and with that comes varying levels of complexity.

## Key Requirements:

Through extensive experience and research, we've compiled a comprehensive CRM evaluation checklist of the most critical CRM requirements to look for when researching and comparing vendors for your business. These requirements are the most common for the average company, but some may not be applicable to everyone. Different CRM systems focus on different capabilities, so it's vital to know what functionality your organization requires via a CRM.

The following are a checklist of typical CRM requirements in our System:

1. Database Management.
2. Ticket Management
3. Security
4. Deploy Environment ( Web Based)

## Functional Requirements:

Apart from these key aspects, your business might benefit from a few CRM functional requirements. These should help you overcome specific challenges, efficiently manage business processes, and increase quantitative and qualitative indicators.

Some CRM from a functional point of view:

Sales Tool: Sales features help increase chances of success in deal closure, leading to increased profit. These include:

- Lead Management

- Task Management

Marketing Tool: The right marketing strategy enables you to market key offerings to your target audience.

Customer Service

Make your customers feel valued by personalizing communications, promptly solving their issues and offering valuable information on your offerings.

- Providing Security

- Customizable Ticket Status

CRM requirements gathering isn't a one-and-done activity. As your business evolves and different needs emerge you will require new functionality from our CRM. It's easy to feel overwhelmed by the different needs and requests but with careful management, you can evolve your CRM while keeping team members happy.

# Chapter No: 5
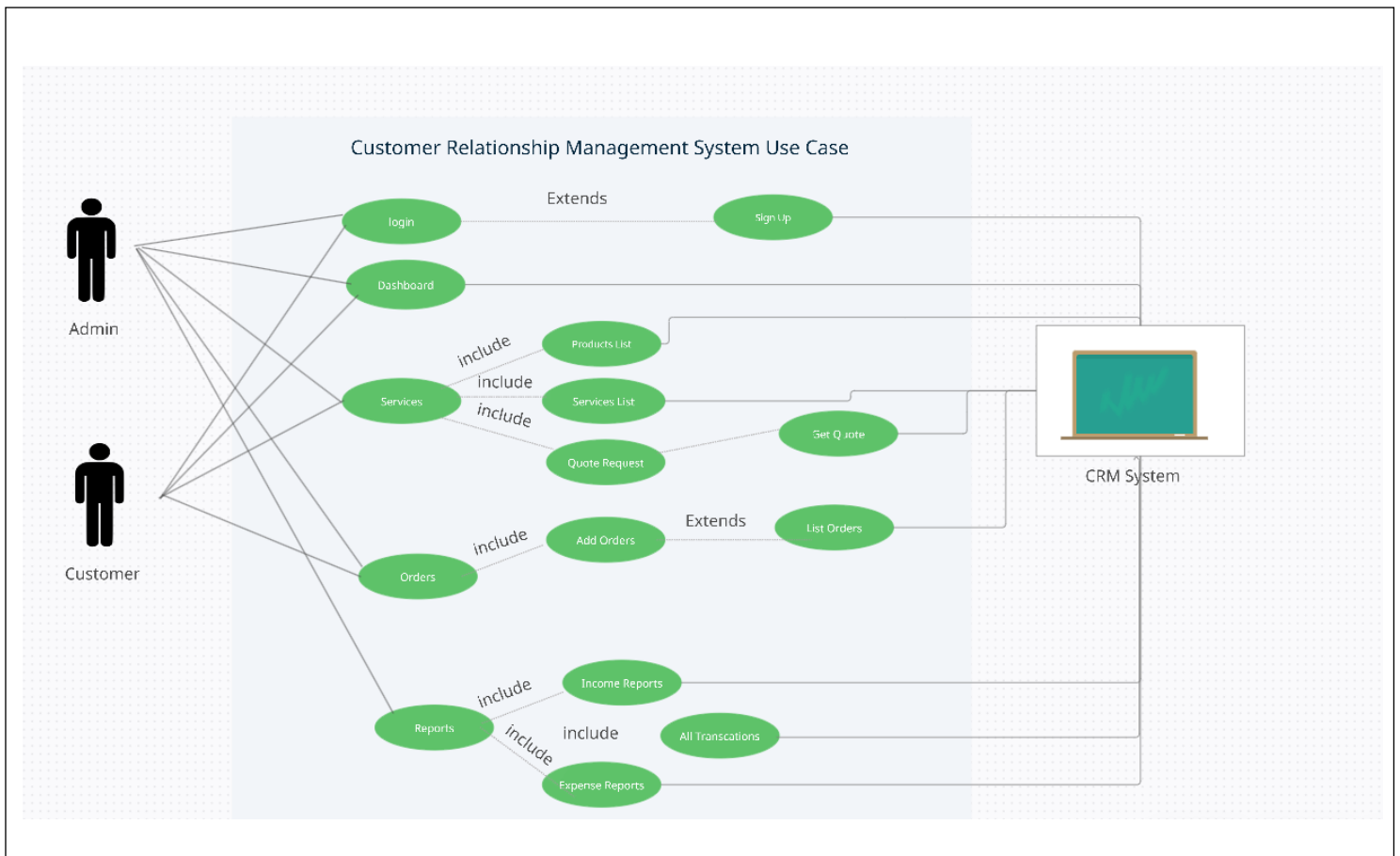
## PROJECT DESIGN

- Use Case Diagram



**Figure 5.1: Use Case Diagram**
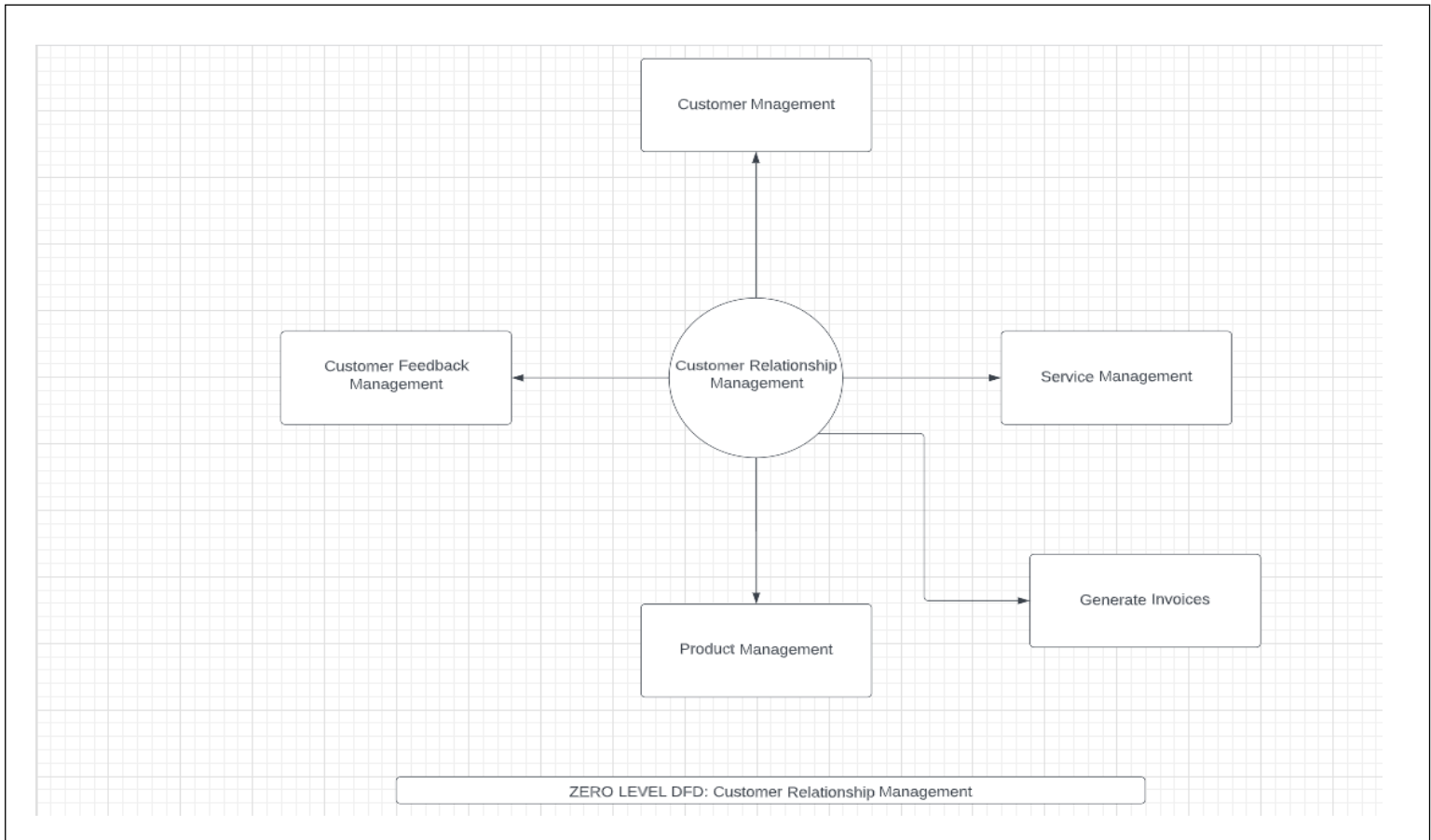
- DFD (Data Flow Diagram)  Diagram
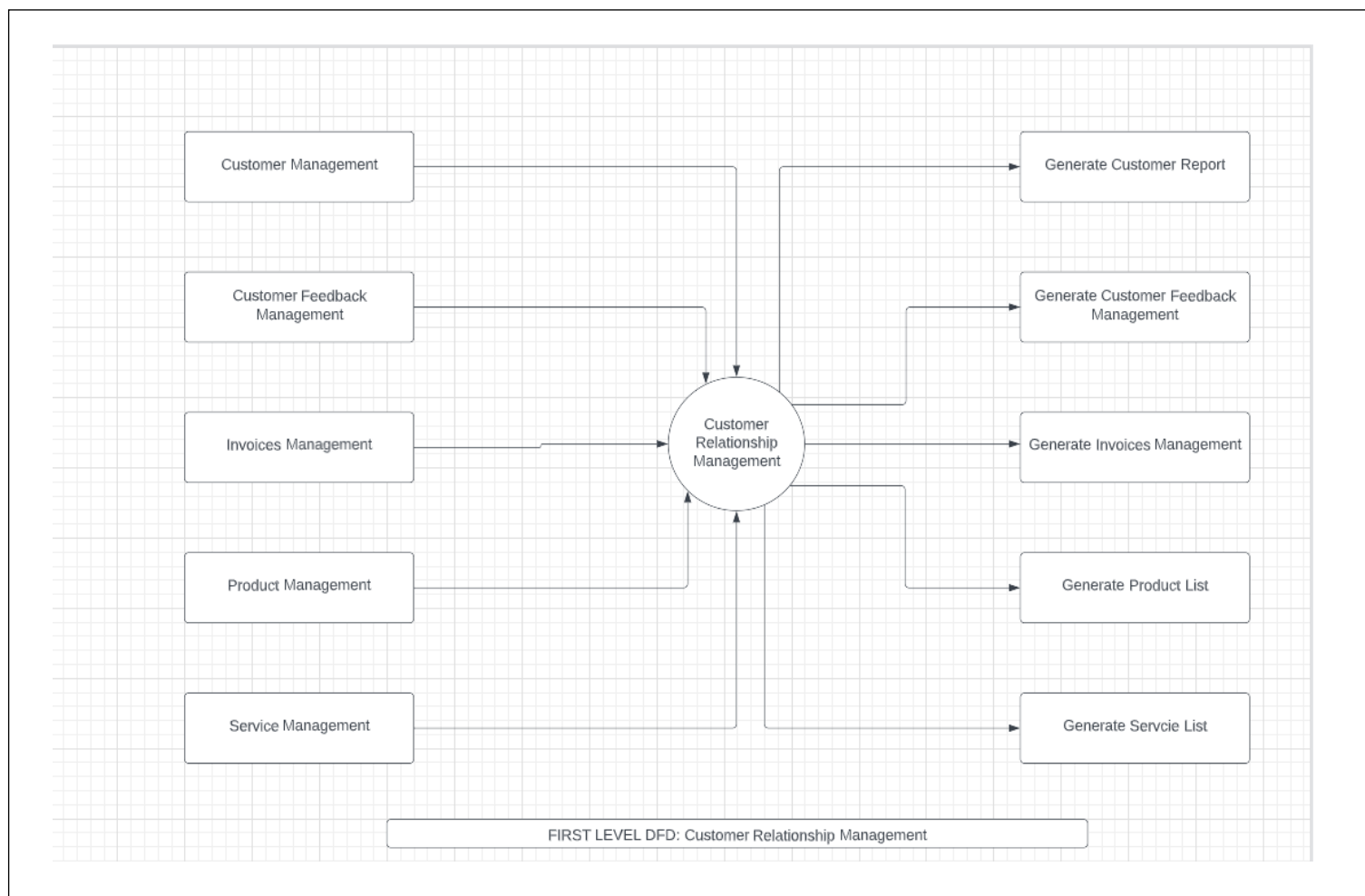


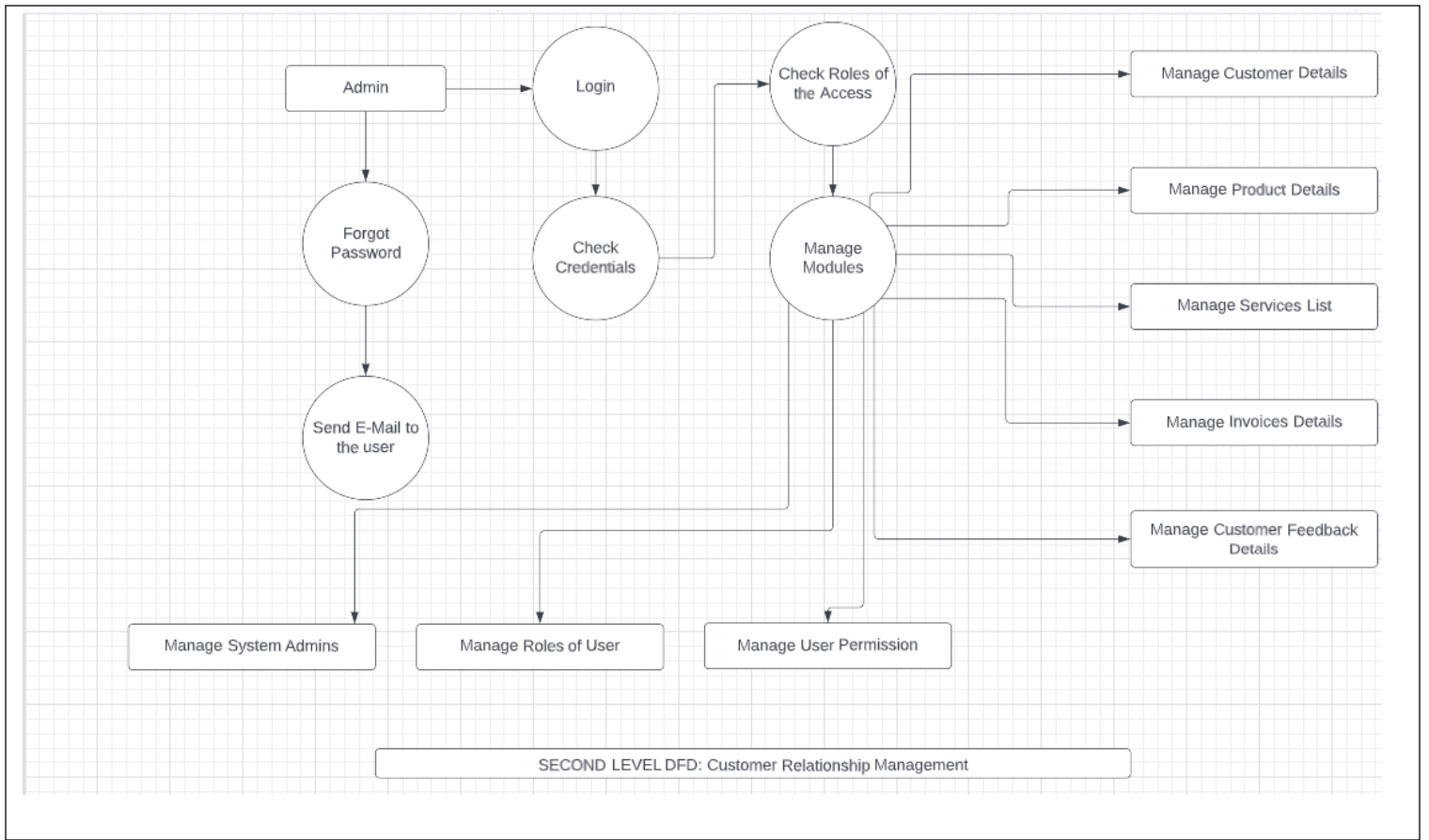**Figure 5.2.1: DFD (Level 0)**

**Figure 5.2.2: DFD (Level 1)**

**Figure 5.2.3: DFD (Level 2)**
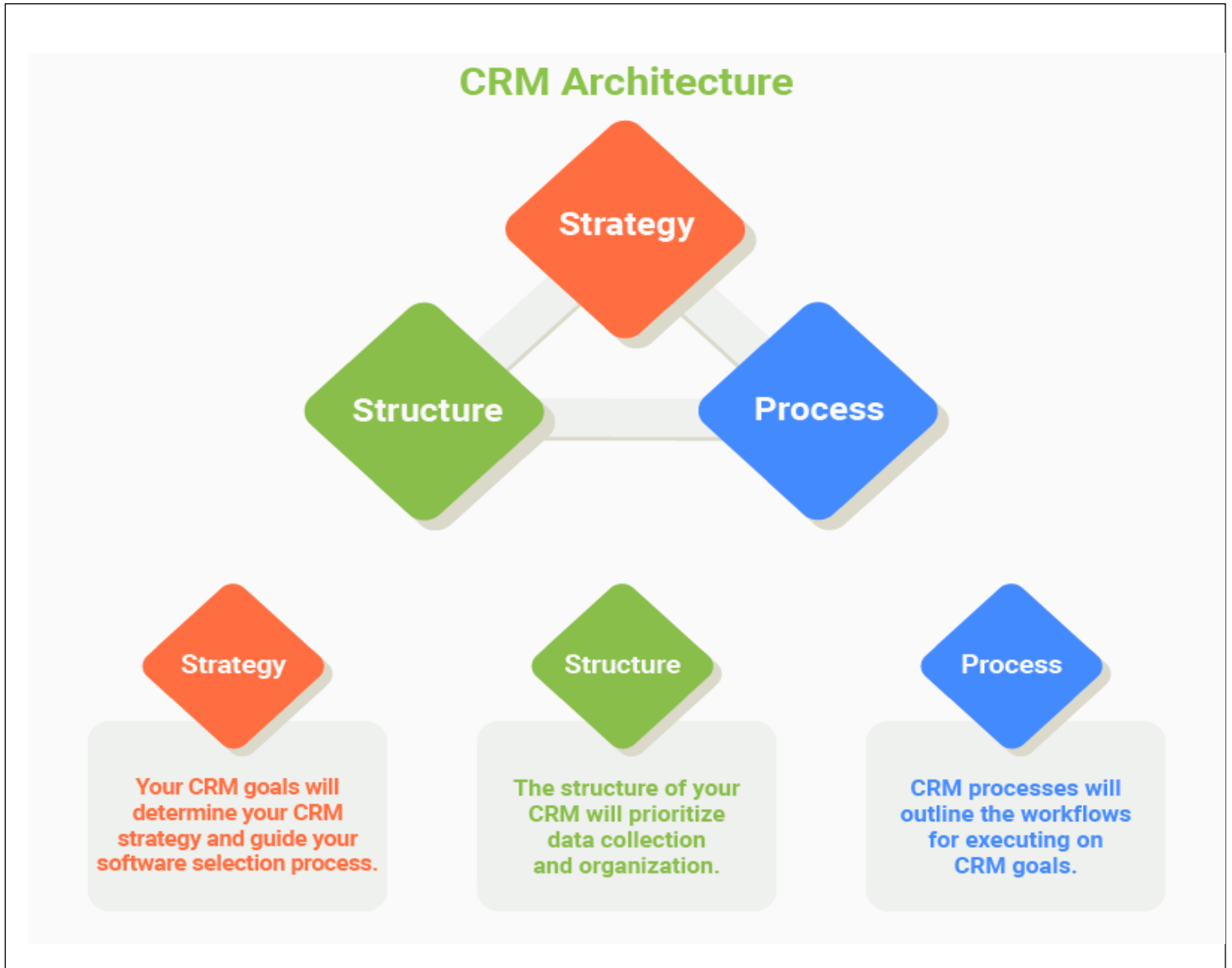
# System Architecture



Figure 5.3: CRM Architecture

# Chapter No: 6

## TECHNICAL SPECIFICATIONS

**Development: VS Code**

VS Code also known as Visual Studio Code is a source code editor made by Microsoft for Windows, Linux, MacOS. It has various features such as Debugging, Syntax highlighting, extension, intelligent code completion.

**Frontend: Html, CSS, JavaScript**

As a web developer, the three main languages we use to build websites are HTML, CSS, and JavaScript. JavaScript is the programming language, we use HTML to structure the site, and we useCSS to design and layout the web page. These days, CSS has become more than just a design language, though. You can actually implement animations and smooth transitions with just CSS.

**OS : Windows**

Windows is a **graphical operating system** developed by Microsoft. It allows users to view and store files, run the software, play games, watch videos, and provides a way to connect to the internet.It was released for both home computing and professional works.

**Backend: Php, MySQL**

With PHP, you can connect to and manipulate databases. MySQL is the most popular database systemused with PHP. PHP combined with MySQL are cross-platform (you can develop in Windows and serve on a Unix platform). The data in a MySQL database are stored in tables. A table is a collectionof related data, and it consists of columns and rows. Databases are useful for storing information categorically.
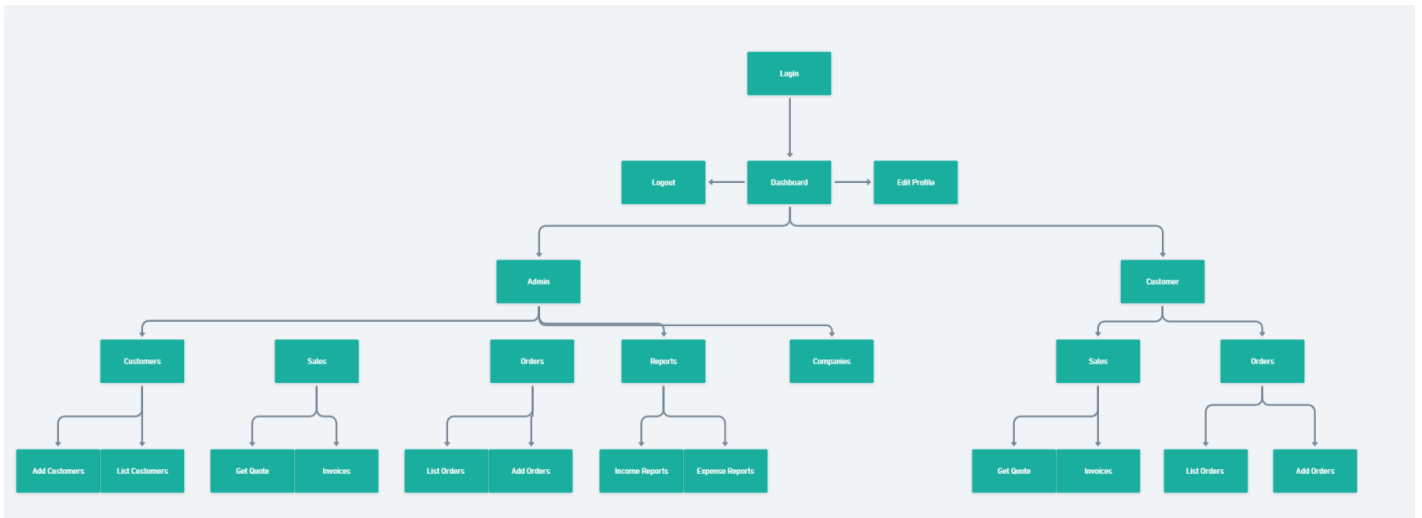
# FLOWCHART
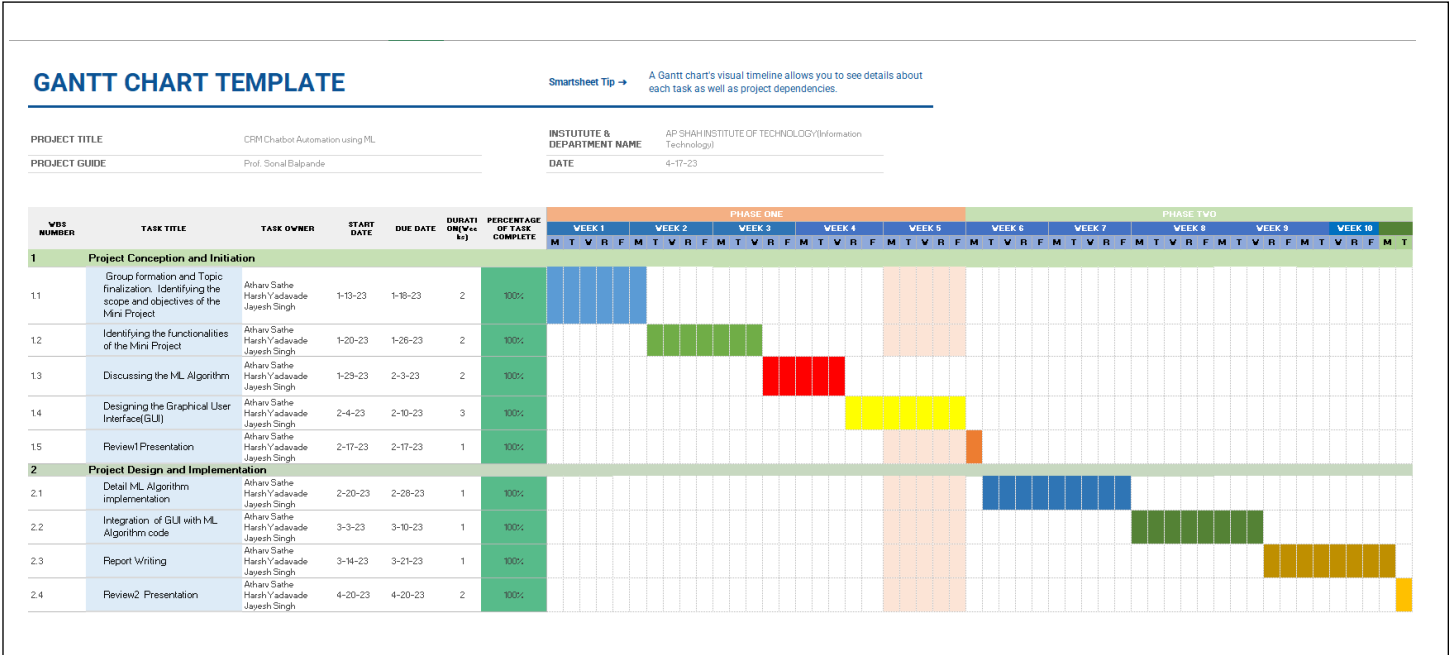


**Figure:  Flowchart of Project**

# GANTT CHART

## GANTT CHART TEMPLATE

| PROJECT TITLE | CRM Chatbot Automation using ML | INSTUTUTE & DEPARTMENT NAME | AP SHAH INSTITUTE OF TECHNOLOGY(Information Technology) |
|---|---|---|---|
| PROJECT GUIDE | Prof. Sonal Balpande | DATE | 4-17-23 |

| WBS NUMBER | TASK TITLE | TASK OWNER | START DATE | DUE DATE | DURATION (Weeks) | PERCENTAGE OF TASK COMPLETE |
|---|---|---|---|---|---|---|
| 1 | **Project Conception and Initiation** | | | | | |
| 1.1 | Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project | Atharv Sathe Harsh Yadavade Jayesh Singh | 1-13-23 | 1-18-23 | 2 | 100% |
| 1.2 | Identifying the functionalities of the Mini Project | Atharv Sathe Harsh Yadavade Jayesh Singh | 1-20-23 | 1-26-23 | 2 | 100% |
| 1.3 | Discussing the ML Algorithm | Atharv Sathe Harsh Yadavade Jayesh Singh | 1-29-23 | 2-3-23 | 2 | 100% |
| 1.4 | Designing the Graphical User Interface(GUI) | Atharv Sathe Harsh Yadavade Jayesh Singh | 2-4-23 | 2-10-23 | 3 | 100% |
| 1.5 | Review1 Presentation | Atharv Sathe Harsh Yadavade Jayesh Singh | 2-17-23 | 2-17-23 | 1 | 100% |
| 2 | **Project Design and Implementation** | | | | | |
| 2.1 | Detail ML Algorithm implementation | Atharv Sathe Harsh Yadavade Jayesh Singh | 2-20-23 | 2-28-23 | 1 | 100% |
| 2.2 | Integration of GUI with ML Algorithm code | Atharv Sathe Harsh Yadavade Jayesh Singh | 3-3-23 | 3-10-23 | 1 | 100% |
| 2.3 | Report Writing | Atharv Sathe Harsh Yadavade Jayesh Singh | 3-14-23 | 3-21-23 | 1 | 100% |
| 2.4 | Review2 Presentation | Atharv Sathe Harsh Yadavade Jayesh Singh | 4-20-23 | 4-20-23 | 2 | 100% |

**Figure:  Gantt Chart**

# Chapter No: 7

## PROJECT SCHEDULING

| Date | Weeks | Contents |
|---|---|---|
| 13/01/2023 TO 18/01/2023 | 1 | Group formation and Topic finalization. Identifying the scope and objectives of the Mini Project |
| 20/01/2023 TO 26/01/2023 | 2 | Identifying the functionalities of the Mini Project |
| 29/01/2023 TO 3/01/2023 | 3 | Discussing the ML Algorithm. |
| 4/02/2023 TO 10/02/2023 | 4 | Designing the Graphical User Interface (GUI) |
| 17/02/2023 TO 17/2/2023 | 5 | Review 1 Presentations |
| 20/02/2023 TO 28/02/2022 | 6 | Detail ML Algorithm implementation |
| 03/03/2023 TO 10/03/2023 | 7 | Integration of GUI with ML Algorithm code |
| 14/03/2023 To 21/03/2023 | 8 | Report Writing |
| 20/04/2023 TO 20/04/2023 | 9 | Review 2 Presentations |

# Chapter No: 08

## IMPLEMENTATION
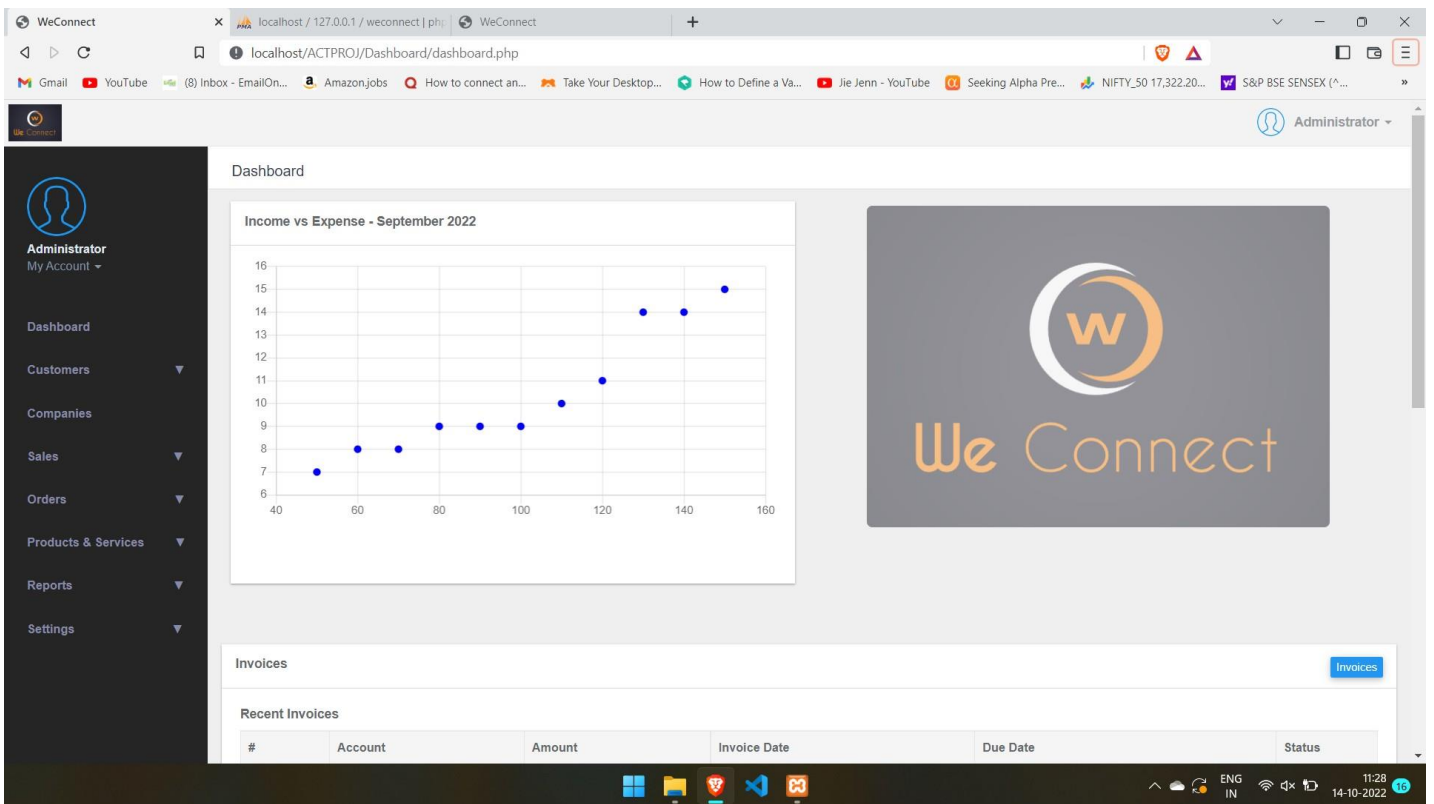


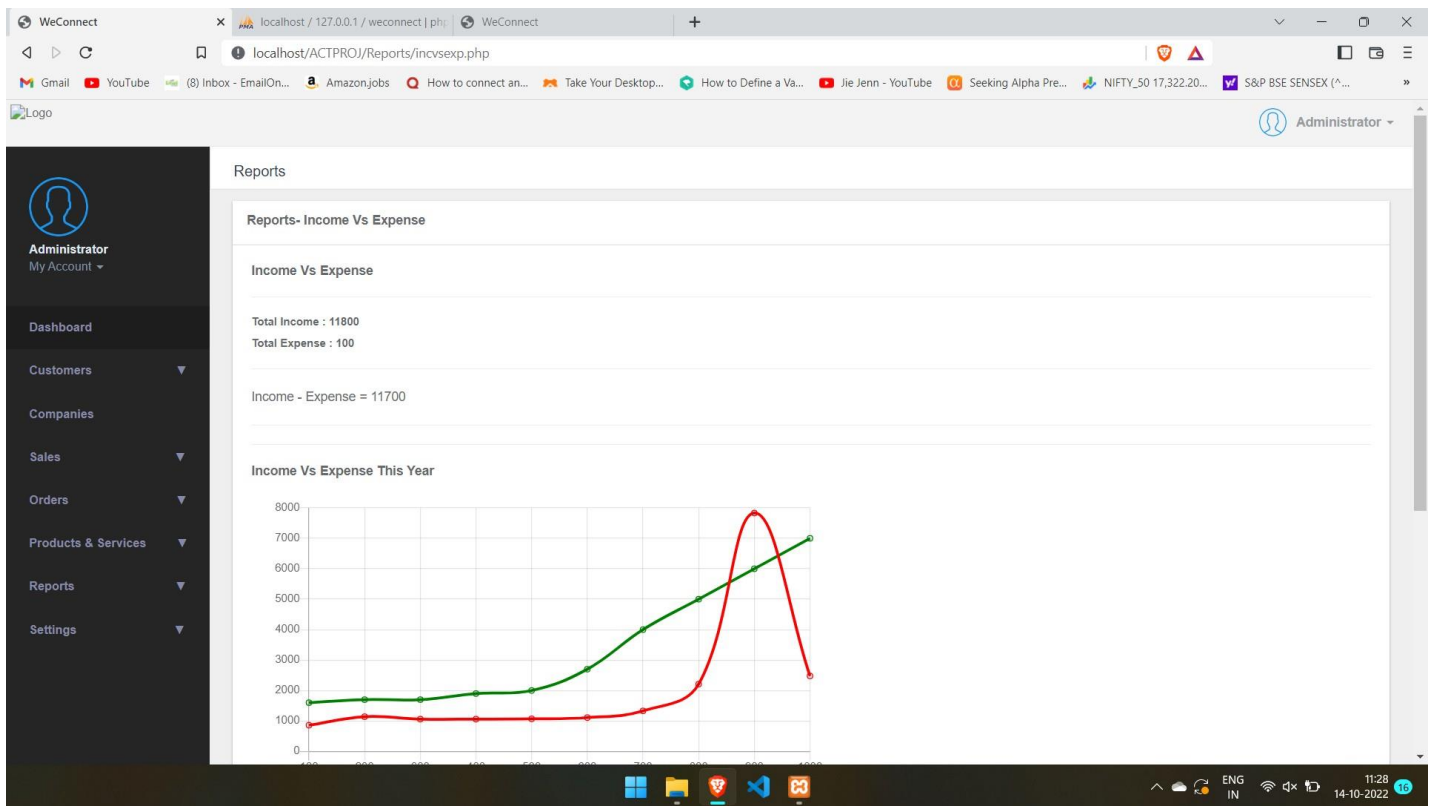**Figure 8.1: Home Screen**

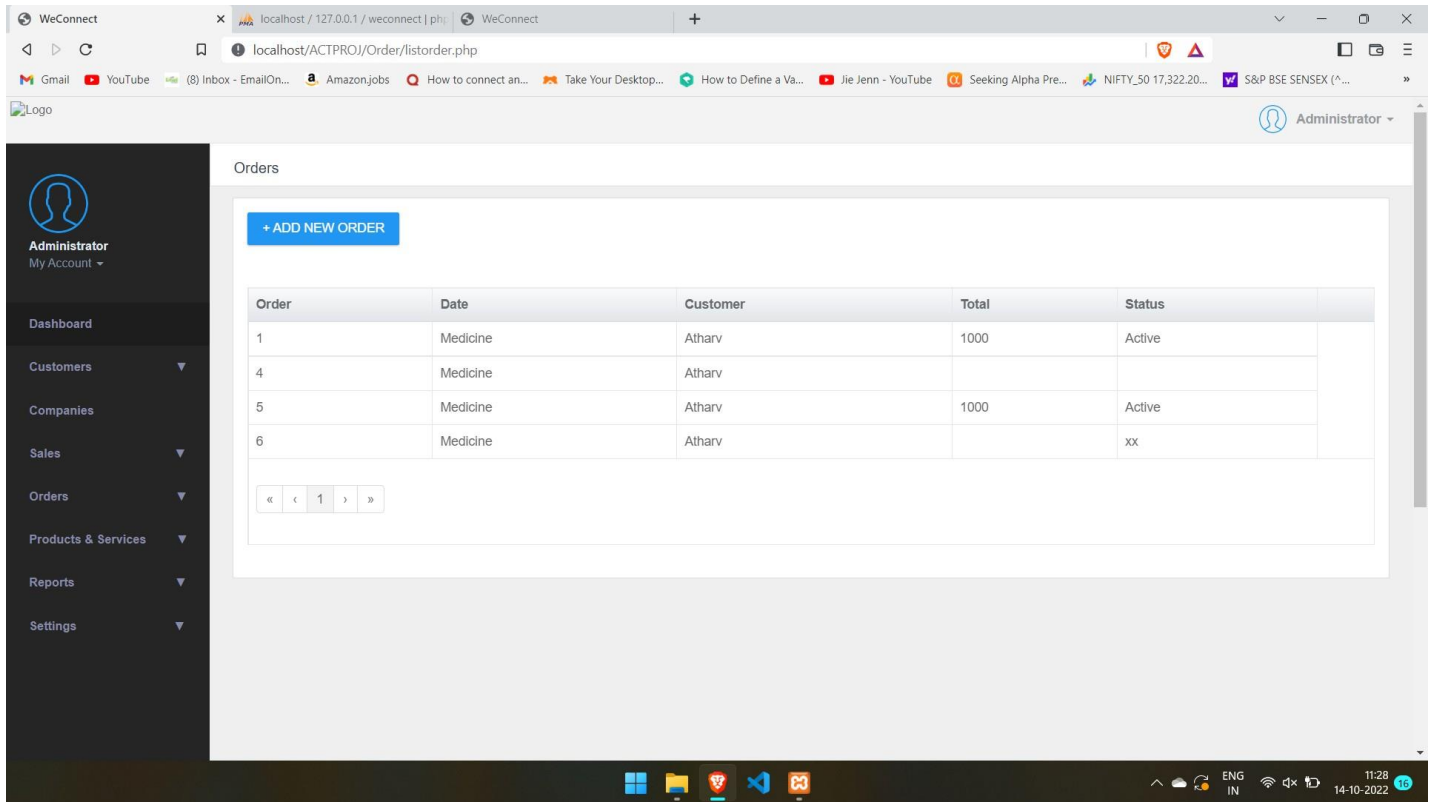**Figure 8.2: Invoice Page**

**Figure 8.3: Dashboard Page**
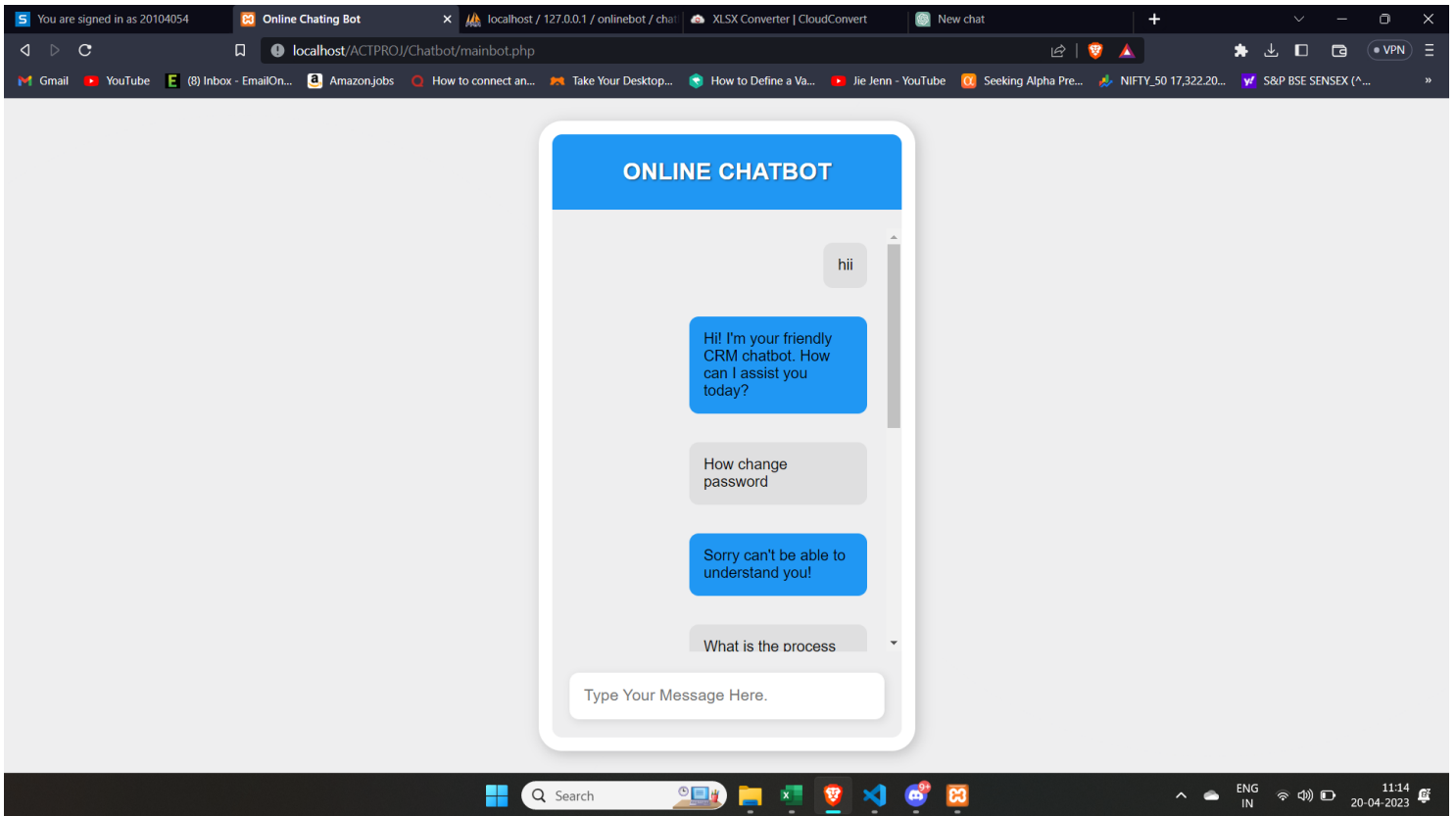
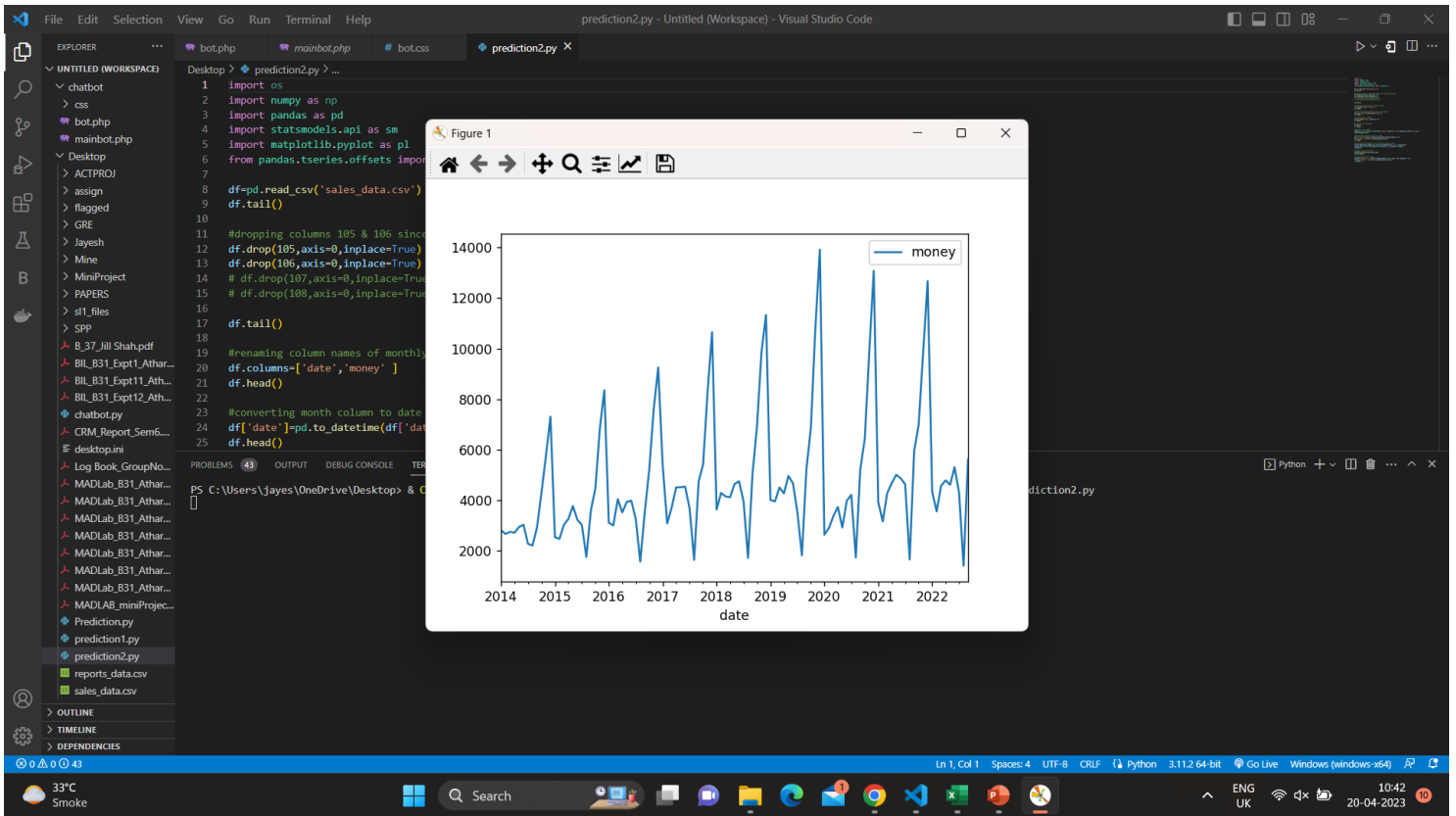**Figure 8.4: Orders Page**

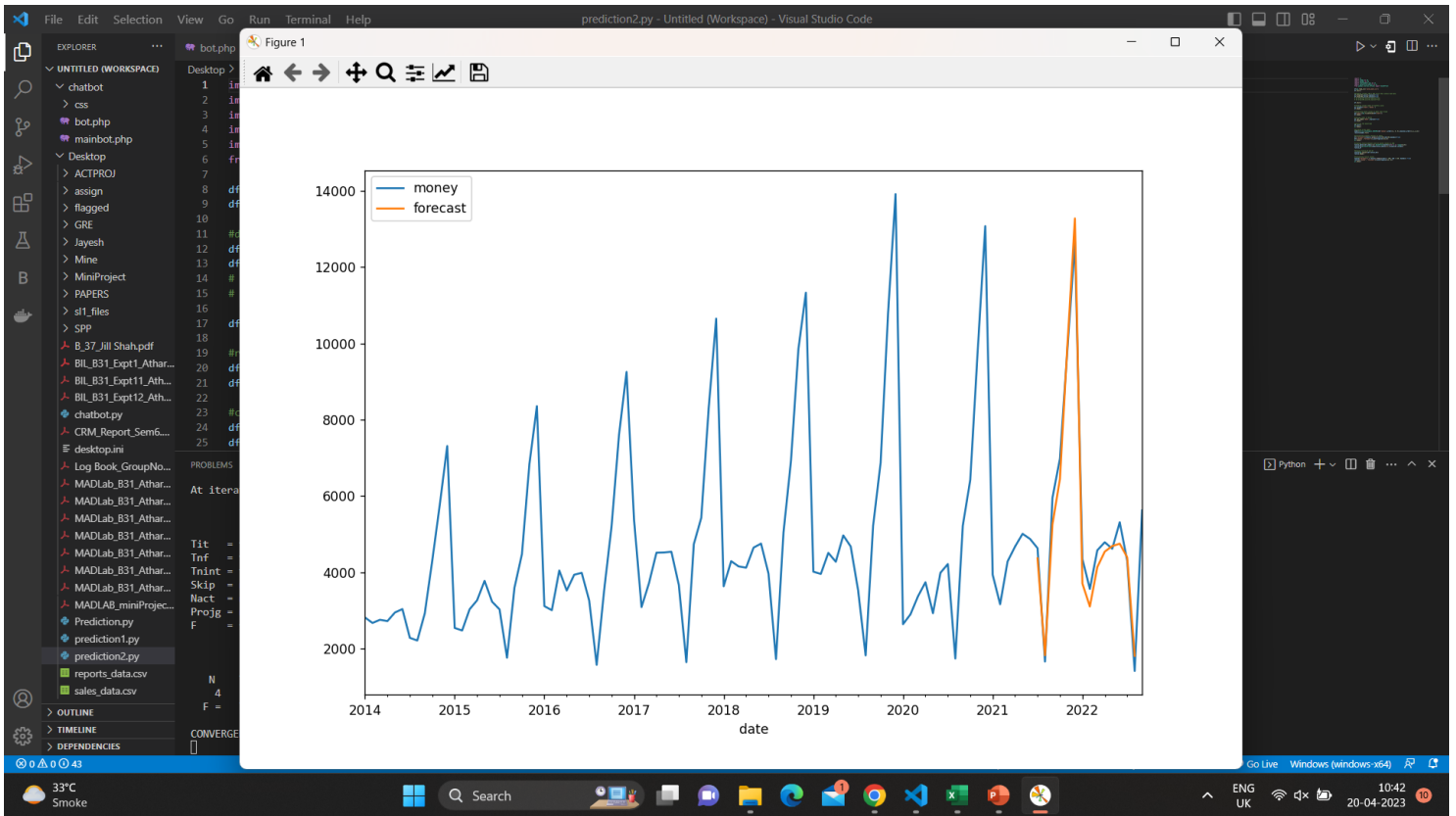**Figure 8.5: Chatbot Page**

**Figure 8.6: Prediction Page -I**

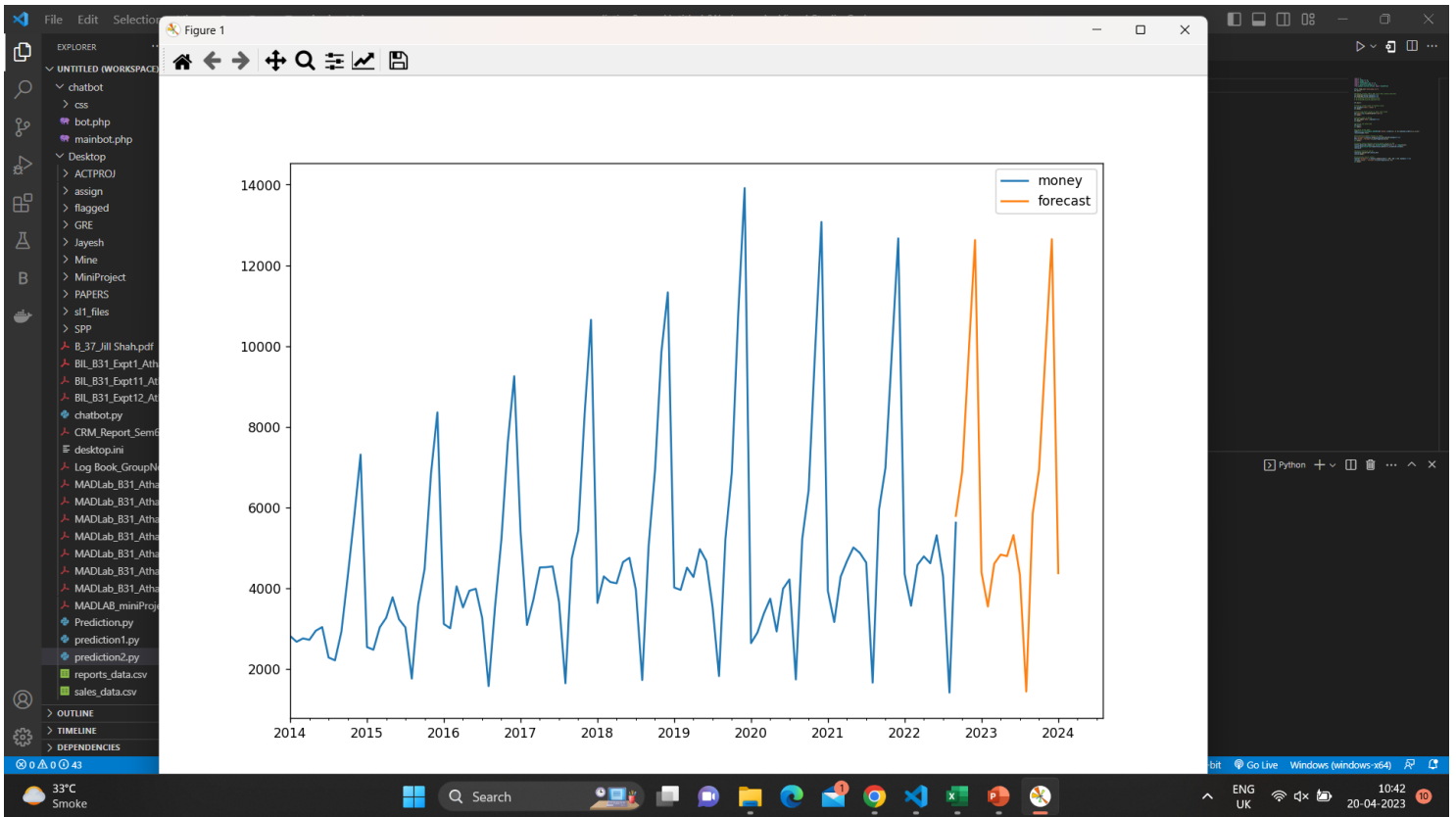**Figure 8.7: Prediction Page - II**

**Figure 8.8: Prediction Page - III**

# Chapter No: 09
# RESULT & DISCUSSION

## Result

A CRM platform helps companies target different audiences, set scores and alerts based on an individual lead or customer's activity, proactively work with contacts, and maintain relationships. Best of all, a CRM system can be used across departments to ensure that all customer-facing teams are empowered with the right data to create incredible customer experiences.

CRM benefits a company in a variety of ways. While the benefits vary by department or industry, six benefits of CRM platforms that affect every user include:

1. Trustworthy reporting

2. Dashboards that visually showcase data

3. Proactive service.

4. Efficiency enhanced by automation

5. Simplified collaboration.

Discussion

- **Need for CRM**

Customer Relationship Management leads to satisfied customers and eventually higher business every time.

Customer Relationship Management goes a long way in retaining existing customers.

Customer relationship management ensures customers return back home with a smile.

Customer relationship management improves the relationship between the organization and customers. Such activities strengthen the bond between the sales representatives and customers.

- Steps for Customer Relationship Management

It is essential for the sales representatives to understand the needs, interest as well as budget of the customers. Don't suggest anything which would burn a hole in their pockets.

Never tell lies to the customers. Convey them only what your product offers. Don't cook fake stories or ever try to fool them.

It is a sin to make customers waiting. Sales professionals should reach meetings on or before time. Make sure you are there at the venue before the customer reaches.

A sales professional should think from the customer's perspective. Don't only think about your own targets and incentives. Suggest only what is right for the customer. Don't sell an expensive mobile to a customer who earns rupees five thousand per month. He would never come back to you and your organization would lose one of its esteemed customers.

Don't oversell. Being pushy does not work in sales. It a customer needs something; he would definitely purchase the same. Never irritate the customer or make his life hell. Don't call him more than twice in a single day.

An individual needs time to develop trust in you and your product. Give him time to think and decide.

Never be rude to customers. Handle the customers with patience and care. One should never ever get hyper with the customers.

Attend sales meeting with a cool mind. Greet the customers with a smile and try to solve their queries at the earliest.

Keep in touch with the customers even after the deal. Devise customer loyalty programs for them to return to your organization. Give them bonus points or gifts on every second purchase.

# Chapter No: 10

## CONCLUSION & FUTURE SCOPE

### Conclusion

Customer Relationship management is a business strategy that enables a business organization to maximize revenue, customer satisfaction, profitability through strategic mobilization, organization, and management of customer's interests and desires.

CRM in the automotive industry is strategically used a model mechanism for brand promotion and customer attraction. The technology comes with imperative customer analysis measures using technological systems for business organization, automation, and synchronization of the business sales, customer services, marketing, and technical support.

CRM has been used to promote local and internal customer interaction elevating the marketing initiative.

Example:

Through CRM information, BMW has been able to identify the target customer base and competitive marketing strategies for customer strengthening and retention.

### Future Scope

- It is quite certain that with great precision the new-gen technology of CRM solutions will help in the sales and marketing to a great deal. This will be done while calculating the better results attained by the marketing team.

- The progression of CRM in the future would mostly depend on how faster API's redefines cloud platforms. And it is simply the beginning of API's era of integrating CRM solution with the business application.

- Even though the benefits of CRM sound quite interesting while its implementation challenges are quite difficult to overcome. And with the advancement of CRM technology every year, this trend of implementation barriers will keep rising.

- In the near future, CRM will be mostly analytical & net-based. More trending technologies of CRMsuch as data analytics & other matrices will be used to analyse the business performance.

- Moreover, more user will be benefited due to the linkage of CRM along with social media as it willsee more popularity in the coming days. Apart from this, the future CRM will enable its user to exchange data over electronic devices more easily than ever.

- Not to mention CRM's immense scope of being integrated with multiple other platforms in the future that will boost its functionalities resulting in great progress and development of company &organizational activities.

- Key CRM Challenges to Overcome

  Being used to the new system leaving the old one

  behindAbility to analyze the CRM data correctly

  Picking the right CRM that blends in

  preciselyNon-expert CRM solution

  provider

  Not retrieving enough actionable business

  insightIntegration in competencies

# Chapter No:

# 11

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