

Med Pad

A PROJECT REPORT

Submitted by,

Ms. SHAMITHA.R

20211IST0020

Ms. SUSHMITHA.VM

20211IST0026

Mr. HITESH.D

20211IST0023

Under the guidance of,

Dr. PALLAVI R

In partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

**COMPUTER SCIENCE AND ENGINEERING, COMPUTER ENGINEERING,
INFORMATION SCIENCE AND ENGINEERING Etc.**

At



PRESIDENCY UNIVERSITY

BENGALURU

DECEMBER 2024

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

CERTIFICATE

This is to certify that the Project report “**Med Pad**” being submitted by “Shamitha, Sushmitha and Hitesh” bearing roll number(s) “20211IST0020, 20211IST0026, 20211IST0023” in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in **Computer Science and Engineering** is a bonafide work carried out under my supervision.

Dr. PALLAVI R
HOD
School of CSE&IS
Presidency University

Dr. PALLAVI R
HOD
School of CSE&IS
Presidency University

Dr. L. SHAKKEERA
Associate Dean
School of CSE
Presidency University

Dr. MYDHILI NAIR
Associate Dean
School of CSE
Presidency University

Dr. SAMEERUDDIN KHAN
Pro-Vc School of Engineering
Dean -School of CSE&IS
Presidency University

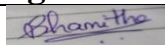

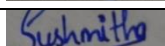
PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **Med Pad** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Dr. PALLAVI R,** HOD School of **Computer Science Engineering& Information Science, Presidency University, Bangalore.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

Sl.No	Roll Number	Name	Signature
01	20211IST0020	SHAMITHA.R	
02	20211IST0023	HITESH.D	
03	20211IST0026	SUSHMITHA.V.M	

ABSTRACT

Enhancing Pharmaceutical Sales Efficiency through Med Pad

The pharmaceutical industry grapples with a persistent challenge: underperformance by Medical Representatives (MRs). This significant factor contributes to poor sales figures. Inefficiencies in MR operations, akin to systemic flaws in governance, create a bottleneck in achieving optimal market penetration and prescription rates. Despite their limitations, MR's remain indispensable in bridging the gap between pharmaceutical companies and healthcare providers.

Med Pad emerges as an innovative, all-in-one platform designed to revolutionize the working processes of MR's. Med Pad is an integrated platform that enhances MR productivity by offering tools that bridge the gap between pharmaceutical companies and healthcare providers. The platform's core functionality revolves around a machine-learning-based recommendation system. This system analyzes historical sales data, prescribing patterns, and market trends to suggest high-potential doctors and regions. By focusing on untapped or underserved areas, known as "virgin markets," MRs can maximize market penetration and expand their influence in areas of unmet medical need.

Med Pad integrates cutting-edge technology to streamline MR activities, potentially leading to exponential improvements in prescription rates and market reach. At the heart of Med Pad lies a recommendation system powered by machine learning algorithms. This system analyzes historical sales data to suggest high-potential doctors and regions, ensuring that untapped markets, or "virgin areas," are effectively targeted.

Another crucial feature of Med Pad is its digital marketing material repository, replacing the cumbersome practice of carrying physical brochures and flyers. Med Pad, a centralized platform, streamlines promotional resource accessibility, reducing logistical inefficiencies. It introduces a review and sentiment analysis system, enabling MRs to gather and analyze doctor feedback on medications. Data-driven insights inform refined marketing strategies and product presentations. Med Pad addresses geographic and logistical barriers with its video conferencing capability, reaching doctors in remote or underserved areas. This feature fosters engagement in hard-to-access locations and facilitates prescription acquisition from regions with high unmet medical needs.

Furthermore, Med Pad incorporates MR training and knowledge assessment tools, ensuring representatives' proficiency in product offerings. Regular evaluations, conducted via integrated video conferencing, maintain high standards of professionalism and expertise. Robust security features, including login authentication, safeguard sensitive data and guarantee reliability.

Designed for scalability, Med Pad adapts to evolving business needs, making it a future-proof solution for pharmaceutical companies. Fingerprint authentication, underpinning Med Pad's security, ensures the confidentiality of sensitive sales and marketing data. Its scalability and reliability position it as a future-proof solution, adaptable to the changing needs of pharmaceutical companies.

Med Pad empowers MRs with advanced analytics, centralized resource management, and remote communication tools, enhancing efficiency and effectiveness. This platform represents a significant advancement in addressing pharmaceutical marketing challenges. By combining AI-driven recommendations, centralized resource management, advanced analytics, and remote communication tools, Med Pad empowers MRs to deliver superior results, ensure quality control, and expand market reach. It becomes an indispensable asset for pharmaceutical companies seeking sustained growth and improved prescription rates.

ACKNOWLEDGEMENT

First of all, we indebted to the **GOD ALMIGHTY** for giving me an opportunity to excel in our efforts to complete this project on time.

We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan**, Pro-VC, School of Engineering and Dean, School of Computer Science Engineering & Information Science, Presidency University for getting us permission to undergo the project.

We express our heartfelt gratitude to our beloved Associate Deans **Dr. Shakeera L and Dr. Mydhili Nair**, School of Computer Science Engineering & Information Science, Presidency University, and Dr. “**PALLAVI R**”, Head of the Department, School of Computer Science Engineering & Information Science, Presidency University, for rendering timely help in completing this project successfully.

We are greatly indebted to our guide **Dr. PALLAVI R**, HOD and Reviewer **Mr. Srinivas Mishra**, Professor, School of Computer Science Engineering & Information Science, Presidency University for **her** inspirational guidance, and valuable suggestions and for providing us a chance to express our technical capabilities in every respect for the completion of the project work.

We would like to convey our gratitude and heartfelt thanks to the PIP2001 Capstone Project Coordinators **Dr. Sampath A K, Dr. Abdul Khadar and Mr. Md Zia Ur Rahman**, department Project Coordinators Mr. Srinivas Mishra and Git-Hub coordinator **Mr. Muthuraj**.

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

SHAMITHA.R

SUSHMITHA V. M

HITESH .D

LIST OF TABLES

Sl. No.	Table Name	Table Caption	Page No.
1	Table 2.1	Literature Review	5-10

LIST OF FIGURES

Sl. No.	Figure Name	Caption	Page No.
1	Figure 6.1	System Design	19
2	Figure 6.2	Architecture	23
3	Figure 7.1	Gantt Chart	25
4	Figure 2.1	Login page	51
5	Figure 2.2	Website	51
6	Figure 2.3	Materials page	51
7	Figure2.4	Survey page	52
8	Figure 2.5	Recommendation	52-53
9	Figure 2.6	Video Conference	54
10	Figure 3.1	SDG Mapping	55

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	IV
	ACKNOWLEDGEMENT	VI
	LIST OF TABLES	VII
	LIST OF FIGURES	VIII
1.	INTRODUCTION	1
	1.1 Background	1
	1.2 Research Motivation and problem statement	2
	1.3 Summary	3
2.	LITERATURE REVIEW	5
	2.1 Literature Review	5
3.	RESEARCH GAPS OF EXISTING METHODS	10
4.	PROPOSED METHODOLOGY	14
5.	OBJECTIVES	17
6.	SYSTEM DESIGN AND IMPLEMENTATION	19
	6.1 System Workflow	21
	6.2 Implementation	22
7	PROJECT TIMELINE	25
8	OUTCOMES	26

9	RESULTS AND DISCUSSIONS	28
10	CONCLUSION	31
11	REFERENCES	34
12	APPENDIX A - PSEUDOCODE	35
13	APPENDIX B – SCREENSHOTS	49
14	APPENDIX C – ENCLOSURES	53

CHAPTER-1

INTRODUCTION

The pharmaceutical industry, a cornerstone of global healthcare, relies heavily on Medical Representatives (MRs) to ensure the accessibility of essential medications. However, MRs often face significant challenges that hinder their growth and market penetration.

One key issue is the inefficiency and underperformance of MR's. Despite their crucial role in promoting products, providing information, and gathering feedback, MRs often struggle with poor targeting, inadequate resource management, lack of continuous training, and difficulty reaching remote areas. These challenges lead to poor sales figures, suboptimal market coverage, and missed opportunities for growth.

To address these inefficiencies, the pharmaceutical industry has embraced technology solutions to optimize MR performance and streamline the sales process. Med Pad, an innovative mobile application, is designed to enhance MR productivity and effectiveness.

Med Pad offers a range of unique tools tailored to address the key challenges faced by MRs. These include a recommendation system to help MRs identify high-yielding doctors and regions, marketing material management to streamline product promotion, doctor review collection to gather feedback, sentiment analysis to gauge doctor sentiment, video conferencing capabilities for remote consultations, and knowledge monitoring to ensure MRs stay up-to-date with industry trends.

By integrating these advanced features into a single platform, Med Pad aims to improve MR daily workflows and increase prescription rates. This, in turn, leads to improved market penetration and greater success for pharmaceutical companies.

1.1 Background

1.1.1 Inefficiency in Targeting and Coverage: Medical Representatives (MRs) often struggle with poor territory management and ineffective targeting. In many cases, MRs lack the tools to strategically identify which doctors or regions would yield the highest return on investment (ROI). Without data-driven insights, MRs may waste time visiting physicians in already saturated markets or neglecting underserved areas where demand for specific products may be higher. This inefficiency leads to missed opportunities for prescription

growth.

1.1.2 Limited Access to Marketing Materials: A significant challenge faced by Medical Representatives (MRs) is the need to carry bulky marketing materials, such as brochures, flyers, and product samples. This not only increases the logistical burden but also restricts MRs' quick access to up-to-date content for their meetings. The lack of centralized access to marketing materials creates a fragmented and inefficient workflow that negatively impacts MRs' ability to effectively communicate product information.

1.1.3 Inconsistent Training and Knowledge Gaps: MRs must be well-informed about the products they represent to effectively communicate their benefits to doctors. However, without regular training and knowledge updates, MRs may be inadequately prepared to answer questions or provide in-depth insights during interactions with healthcare providers. This knowledge gap can erode trust and credibility, ultimately limiting MRs' effectiveness in securing prescriptions.

1.1.4 Geographical Barriers: One of the most significant challenges for MRs is reaching healthcare providers in remote or underserved areas. In these regions, MRs may encounter difficulties in establishing personal connections with doctors or promoting products effectively due to geographical constraints. Moreover, healthcare providers in such locations often face limited access to the latest medications, contributing to the healthcare divide.

1.2 Research Motivation and Problem Statement

1.2.1 Med Pad's recommendation system aims to address the issue of inefficient territory targeting by utilizing machine learning algorithms to analyze past sales data and prescribing patterns. Through this analysis, the platform suggests high-potential doctors and regions, enabling MRs to focus on areas with greater likelihood of generating prescriptions. By targeting virgin markets and untapped regions, MRs can significantly enhance their reach and sales outcomes. This AI-driven feature ensures that time and resources are allocated where they can yield the most significant impact.

1.2.2 Med Pad revolutionizes the traditional marketing material repository model by replacing physical materials with a digital platform. This eliminates the logistical burden of carrying bulky materials and ensures quick and easy access to the most up-to-date content

for Medical Representatives (MRs). The app facilitates direct sharing of promotional materials with doctors, promoting consistency and reducing information dissemination delays.

1.2.3 Med Pad stands out with its unique doctor review and sentiment analysis tool. MRs can collect feedback from doctors about specific medications, which is then analyzed using natural language processing (NLP) and sentiment analysis techniques. This valuable feedback provides insights into doctors' perceptions of products, enabling pharmaceutical companies to refine their marketing strategies and identify areas for improvement. Moreover, this feature strengthens MR-client relationships by demonstrating a commitment to listening and responding to feedback.

1.2.4 Med Pad addresses geographical barriers with its video conferencing feature. It enables real-time, face-to-face communication between MRs and doctors in remote areas, expanding MRs' reach beyond geographical constraints. This feature allows MRs to engage with doctors in underserved regions where in-person visits may be logistically challenging. By conducting video consultations, Med Pad enables the acquisition of prescriptions from areas often neglected by traditional sales teams.

1.2.5 Med Pad addresses the issue of inconsistent training by implementing a continuous knowledge monitoring system. Regular online assessments are conducted to test MRs' product knowledge, and the platform facilitates video-based training sessions. This ensures that MRs stay updated with the latest product information and industry trends, enabling them to effectively communicate with healthcare providers. Regular assessments also help identify and address any knowledge gaps promptly, ensuring that MRs are always well-prepared for their interactions with doctors.

1.3 Summary

In conclusion, Med Pad presents a comprehensive solution to the numerous challenges faced by Medical Representatives in the pharmaceutical industry. By harnessing cutting-edge technology, such as machine learning, sentiment analysis, and video conferencing, Med Pad

empowers Medical Representatives to effectively target the right markets, access marketing materials, engage with doctors remotely, and continuously enhance their product knowledge. The platform addresses inefficiencies at every level of the MR's workflow, leading to increased prescription rates and expanded market reach. As the pharmaceutical industry evolves, tools like Med Pad offer an innovative approach to improving MR performance, enhancing sales effectiveness, and ultimately contributing to the growth and success of pharmaceutical companies. Med Pad's combination of AI-driven insights, digital tools, and robust support features positions it as a game-changer in the pharmaceutical sales landscape, making it an indispensable asset for companies seeking to achieve a tenfold increase in prescriptions.

CHAPTER-2

LITERATURE SURVEY

2.1 Literature Review

Title	“Innovative Robotic Technologies and Artificial Intelligence in Pharmacy and Medicine: Paving the Way for the Future of Health Care” [1]
Year	2023
Methodology	Examines historical applications, advancements in technology, and the global impact of telemedicine, particularly during the COVID-19 pandemic. It synthesizes findings from previous studies to highlight telemedicine's strengths, limitations, and future potential in healthcare systems.
Key Findings	Robotics and AI revolutionize healthcare by improving efficiency, precision, and personalization while addressing ethical and operational challenges.
Applications	Robotic and AI systems enhance drug manufacturing, surgery, diagnostics, personalized medicine, and public health initiatives.

2.1.1

Title	“The role of telemedicine in healthcare: an overview and update” [2]
Year	2023
Methodology	This paper performs a systematic review of telemedicine's evolution, drawing from historical developments, recent technological advances, and global implementation practices. It assesses the benefits and limitations of telemedicine across various medical specialties and geographical contexts.
Key Findings	Telemedicine reduces costs, enhances convenience, and bridges healthcare access gaps but lacks physical examination capabilities and faces technological challenges.
Applications	Remote consultations, chronic disease monitoring, emergency triage, medical education, and reducing rural–urban healthcare disparities.

2.1.2

Title	“Applying Machine Learning and Statistical Forecasting Methods for Enhancing Pharmaceutical Sales Prediction”[3]
Year	2024
Methodology	The study combined traditional and machine learning techniques to forecast pharmaceutical sales using a dataset of 600,000 transactions from 2014 to 2019. Methods included ARIMA, LSTM neural networks, and XG Boost, with data segmented into eight ATC groups to account for seasonal trends.
Key Findings	XG Boost demonstrated superior accuracy, achieving the lowest mean absolute percentage error (MAPE) in multiple categories, outperforming traditional models like ARIMA and exponential smoothing. Seasonal variations were prominent, influencing drug demand patterns.
Applications	These advanced forecasting methods enable pharmaceutical companies to optimize production, inventory management, and marketing, ensuring better alignment with demand fluctuations and improving customer satisfaction.

2.1.3

Title	“Artificial intelligence-driven pharmaceutical industry: A paradigm shift in drug discovery, formulation development, manufacturing, quality control, and post-market surveillance” [4]
Year	2024
Methodology	The paper employs a comprehensive review approach to analyze the transformative role of AI across all stages of the pharmaceutical industry, including drug discovery, formulation development, manufacturing, quality control, and post-market surveillance.
Key Findings	AI accelerates drug discovery, enhances manufacturing efficiency, optimizes quality control processes, and enables robust post-market surveillance. Challenges such as data handling and integration are identified alongside significant prospects for personalized medicine and supply chain optimization.
Applications	The findings are applicable in streamlining pharmaceutical processes, enhancing the safety and efficacy of drugs, and supporting data-driven decisions for regulatory compliance and innovation in healthcare delivery.

2.1.4

Title	“Security Mechanisms of a Mobile Health Application for Promoting Physical Activity among Older Adults ” [5]
Year	2021
Methodology	The paper developed and validated a security framework for the Smart Walk mobile health application, targeting data privacy, integrity, and confidentiality in the context of smart cities, using mechanisms like cryptography, token-based authentication, and block chain-supported logging.
Key Findings	The implemented security features effectively safeguard sensitive user data, ensure GDPR compliance, and maintain usability despite a slight impact on system performance during peak activity.
Applications	The framework can enhance the security of mobile health apps for promoting physical activity among older adults, ensuring trust and privacy in smart city environments.

2.1.5

Title	“Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing” [6]
Year	2019
Methodology	The paper conducted qualitative interviews and quantitative surveys among marketing professionals to evaluate the adoption of machine learning (ML) tools in digital marketing, focusing on their use, challenges, and benefits.
Key Findings	ML tools enhance marketing efficiency by automating processes, improving data analysis, and enabling precise targeting, but adoption is hindered by high costs, lack of knowledge, and market constraints.
Applications	These insights support the design of frameworks for integrating ML-driven tools into marketing strategies, improving decision-making and driving innovation in marketing practices(ML in digital marketing).

2.1.6

CHAPTER-3

RESEARCH GAPS OF EXISTING METHODS

Interdisciplinary Integration:

The papers demonstrate a lack of cohesive integration across various disciplines, such as robotics, AI, and ML, in healthcare. For instance, “Innovative Robotic Technologies and Artificial Intelligence in Pharmacy and Medicine” discusses advanced robotic technologies but fails to explore their intersection with telemedicine or digital marketing tools. Similarly, “The Role of Telemedicine in Healthcare” could benefit from incorporating insights from AI-driven pharmaceutical strategies and robotic technologies to create a more comprehensive healthcare ecosystem.

Holistic Approach to AI in Healthcare:

While “Artificial Intelligence-Driven Pharmaceutical Industry” highlights AI’s role in drug discovery and post-market surveillance, it does not address how telemedicine platforms or robotic systems could further enhance these processes. Additionally, there is limited exploration of how security frameworks, such as the one discussed in “Security Mechanisms of a Mobile Health Application,” can be generalized or applied to pharmaceutical AI systems to ensure robust data handling in a highly regulated industry.

Data Integration and Predictive Analytics:

“Applying Machine Learning and Statistical Forecasting Methods for Enhancing Pharmaceutical Sales Predictions” primarily focuses on sales data but lacks a connection to broader healthcare data integration. Telemedicine and robotic technologies generate substantial datasets that could significantly enhance predictive analytics and decision-making. A unified framework integrating these datasets could lead to the creation of more accurate and comprehensive predictive models.

User-Centric Challenges:

The security framework in “Security Mechanisms of a Mobile Health Application” places a strong emphasis on user trust, but this focus is somewhat absent in “Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing,” which centers on marketers and advertisers. Both fields could benefit from collaborative research to enhance user engagement and trust, especially when deploying AI tools in sensitive domains such as healthcare and marketing.

Limited Emphasis on Emerging Markets:

Most papers target generalized or developed healthcare systems, overlooking the unique challenges and opportunities in emerging markets. For instance, the role of telemedicine in rural areas or the applications of robotic technologies in resource-constrained settings are not adequately explored. Similarly, pharmaceutical sales prediction models could incorporate emerging market data to identify untapped opportunities.

Ethical and Regulatory Aspects:

Although review papers and AI applications offer valuable insights into technological advancements, they notably lack detailed discussions on ethical and regulatory implications. This gap is particularly critical in papers like “Artificial Intelligence-Driven Pharmaceutical Industry” and “Security Mechanisms of a Mobile Health Application,” as AI and robotics in healthcare demand strict adherence to ethical standards and compliance with local and international regulations.

Another significant gap is the lack of robust evaluation metrics to assess the effectiveness of proposed frameworks and technologies in real-world scenarios. For example, while “Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing” suggests enablers and process maps, it fails to provide detailed mechanisms to evaluate the practical success of these tools. Similarly, the role of AI in drug discovery and manufacturing could benefit from standardized performance benchmarks.

Furthermore, the papers demonstrate minimal overlap in addressing the need for cross-domain expertise. Professionals in digital marketing, robotics, and pharmaceutical sciences often work in silos. Research that promotes interdisciplinary training or cross-domain applications, such as applying marketing ML models to healthcare or adapting pharmaceutical robotics for telemedicine, remains scarce.

These gaps underscore the necessity for a more interconnected research agenda. By addressing these issues, future studies can pave the way for comprehensive, efficient, and secure healthcare solutions that leverage the full potential of AI, robotics, and telemedicine.

CHAPTER-4

PROPOSED MOTHODOLOGY

Requirement Gathering and Analysis: Conduct in-depth interviews with MRs, sales managers, and stakeholders to pinpoint specific pain points, challenges, and inefficiencies in the current workflow. Identify key features needed, such as a recommendation system, digital storage, feedback collection, video conferencing, knowledge assessment, and security measures. Analyze existing data (sales figures, MR activities, doctor feedback) to define the solution's scope.

System Architecture Design:

Backend Infrastructure: Design a scalable and cloud-based backend to handle data storage, analysis, and user management. The system should be capable of processing large volumes of sales data for machine learning models, storing marketing materials, and managing user interactions.

Frontend User Interface (UI):

Create an intuitive mobile and web interface for MRs, ensuring ease of navigation. The UI must be responsive and accessible across devices, allowing MRs to interact with the platform on the go.

Integration with Existing Systems:

Ensure compatibility and integration with the pharmaceutical company's existing CRM systems for seamless data flow and management.

Development of Key Features:

Recommendation System:

Build a machine learning model that analyzes past sales data, doctor engagement, and prescription trends to recommend target doctors and regions. This system should prioritize untapped areas and optimize MR outreach strategies.

Digital Repository for Marketing Materials:

Develop a secure cloud-based storage system where MRs can access and share marketing

brochures, flyers, videos, and other promotional materials during their interactions with doctors.

Sentiment Analysis Module:

Implement a system that collects and processes doctor feedback (through surveys and reviews), applying sentiment analysis algorithms to generate actionable insights regarding product perception.

Med Pad, a comprehensive solution designed to streamline the operations of Medical Representatives (MRs), incorporates cutting-edge technologies to enhance efficiency and effectiveness.

Video Conferencing System:

Med Pad integrates video conferencing tools that enable seamless communication between MRs and doctors in remote or challenging locations. This feature is meticulously optimized for low-bandwidth connections, ensuring reliable connectivity even in underserved areas.

Knowledge Assessment Module:

Med Pad introduces a robust knowledge assessment system, facilitated by video conferencing with a centralized training team. This system meticulously stores test results, tracks progress, and provides comprehensive learning resources to support MRs' continuous development.

Security and Authentication:

Prioritizing data security, Med Pad implements robust security protocols, including login authentication, to safeguard sensitive information such as marketing materials, sales statistics, and feedback. Encryption protocols are employed to protect data both at rest and in transit, preventing unauthorized access or breaches.

User Experience and Usability Testing:

Med Pad conducts thorough usability testing with MRs to ensure the platform's intuitive design aligns seamlessly with their practical needs. Feedback is meticulously addressed to enhance the user experience, and the design is refined to minimize friction and make features easily accessible, particularly in time-sensitive environments like MR visits.

Deployment and Integration:

Med Pad is seamlessly deployed across the pharmaceutical company's MR teams, ensuring a smooth integration with existing infrastructure. Comprehensive training and support are provided to MRs, equipping them with the knowledge and skills to effectively utilize Med Pad's features, including the recommendation system, access to digital marketing materials, and feedback collection tools.

This meticulous design process ensures that Med Pad is user-friendly, efficient, and scalable, effectively addressing the inefficiencies of Medical Representatives while driving higher sales and enhanced market penetration for pharmaceutical companies.

CHAPTER-5

OBJECTIVES

Med Pad, a comprehensive platform, aims to revolutionize the efficiency of Medical Representatives (MRs) and enhance the effectiveness of pharmaceutical marketing.

1. Streamlined Workflows: Med Pad provides a single, integrated platform with tools that eliminate inefficiencies. Centralized marketing material storage and AI-driven recommendations empower MRs to focus on high-impact activities, reducing wasted effort and maximizing productivity.

2. Data-Driven Targeting: Med Pad utilizes machine learning algorithms to optimize targeting strategies. By analyzing historical sales data, prescribing patterns, and market trends, the platform recommends potential high-value doctors and regions, including untapped “virgin markets.” This ensures that MRs’ efforts are focused where they are most likely to yield results.

3. Enhanced Accessibility: Med Pad addresses the logistical challenge of carrying physical marketing materials by providing a centralized digital repository. MRs can access and share updated brochures, flyers, and product presentations with doctors in real time, maintaining consistency and reducing delays in information dissemination.

4. Expanded Market Reach: Med Pad helps pharmaceutical companies penetrate geographically remote and underserved regions. The video conferencing feature enables MRs to connect with doctors in hard-to-reach areas, addressing healthcare gaps and expanding the company’s market presence.

5. Facilitated Feedback and Sentiment Analysis: Med Pad creates a feedback loop between MRs and healthcare providers through its review system. By collecting and analyzing feedback using sentiment analysis, pharmaceutical companies can refine their marketing strategies, address concerns, and improve product positioning.

Med Pad, a comprehensive platform, focuses on enhancing MR competency and driving business growth. It achieves this by providing continuous training and knowledge updates,

ensuring MRs remain well-informed about product details, market trends, and industry standards. This knowledge boost boosts their confidence and effectiveness in the field.

Med Pad also aims to significantly boost prescription rates for pharmaceutical companies by addressing inefficiencies, optimizing targeting, and facilitating better doctor interactions. The platform's integrated tools are designed to help MRs achieve a 10x increase in prescriptions, directly contributing to business growth.

Furthermore, Med Pad promotes better coordination between field teams and the company headquarters. Features like centralized content distribution, real-time communication tools, and performance monitoring ensure that MRs receive continuous support and alignment with the company's overall strategy.

Data security is another key priority for Med Pad, given the sensitive nature of sales data and doctor interactions. Robust security measures, such as fingerprint authentication, are implemented to protect the platform from unauthorized access and ensure compliance with data privacy regulations.

Lastly, Med Pad is designed to be scalable and long-term sustainable. The platform is created to be reliable, scalable, and capable of integrating new features or handling increased usage as the company grows. This ensures long-term utility and relevance for Med Pad.

CHAPTER-6

SYSTEM DESIGN & IMPLEMENTATION

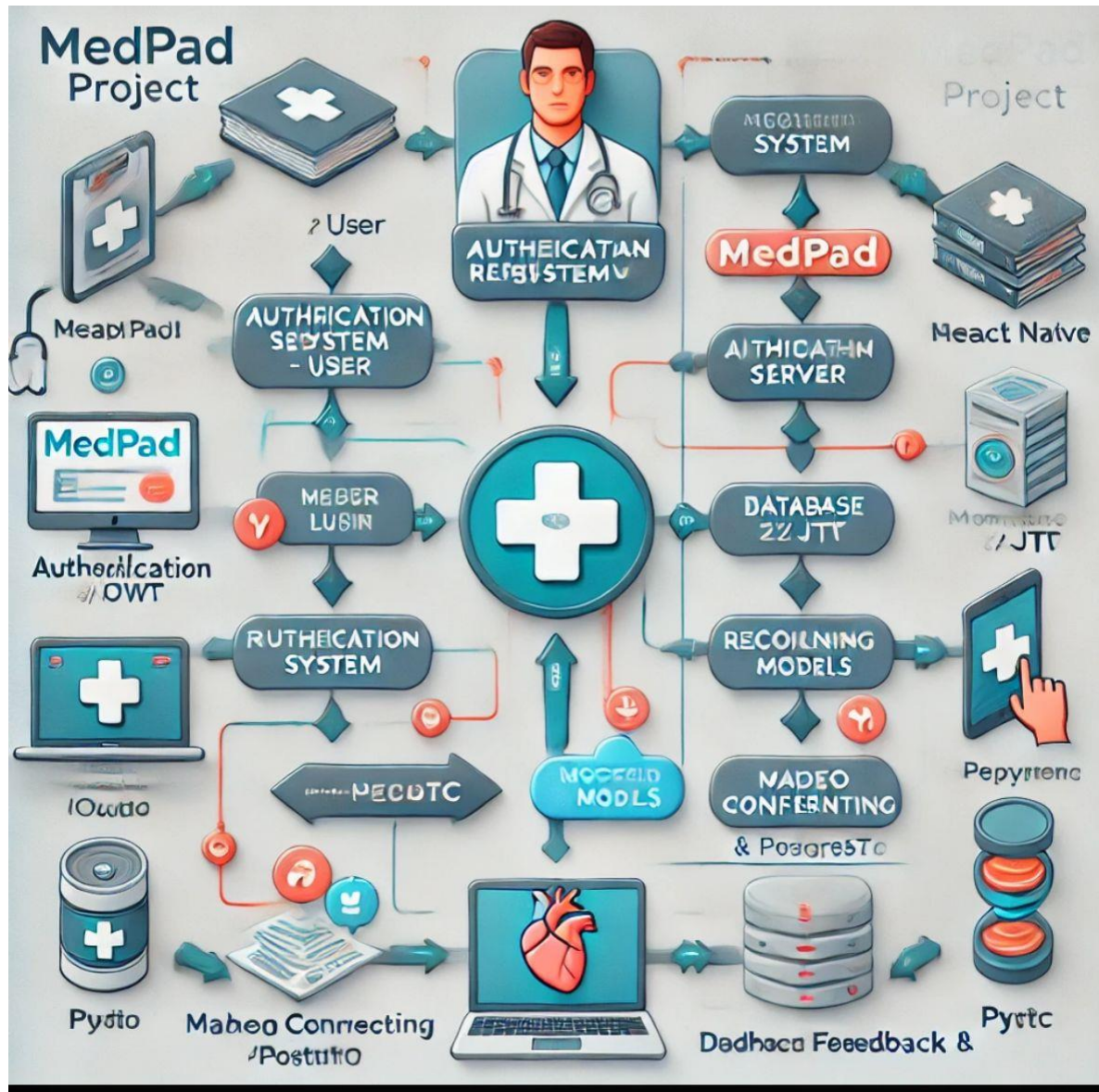


Figure 6.1

Med-Pad's architecture comprises a three-tier structure:

- *Presentation Layer (Frontend):*

- Interfaces for MRs and other users (e.g., admins, knowledge centers).
- Mobile app (Android/IOS) built using Flutter or React Native for cross-platform compatibility.
- Responsive web-based dashboard for admin and Knowledge Distribution Centre access.

- *Business Logic Layer (Backend):*

- Processes requests from the frontend and executes core functionalities like recommendations, sentiment analysis, and video conferencing.
- Technologies: REST APIs API's using Node.js
- Machine Learning models hosted Collaborative filtering and text classification for recommendations and sentiment analysis.
- Integration with video conferencing SDKs Jitsi

- *Data Layer:*

- Stores user data, marketing materials, test results, feedback, and logs.
- Technologies:
 - No SQL Database: Mongo DB for unstructured data like feedback, marketing materials, and logs.
 - Cloud Storage: Mongo DB for storing large files like video conference recordings and brochures.

B. Marketing Material Storage

The purpose of this section is to provide easy access to brochures, flyers, and presentations.

Workflow:

- Materials are uploaded by the MR via the web portal.
- MRs and Doctors an access and download these materials from the website.

C. Sentiment Analysis

The purpose of this section is to analyze reviews provided by doctors.

Workflow:

- Doctors submit feedback via survey forms on the app.
- The text data is processed using natural language processing (NLP) models for sentiment analysis.
- The results (positive, neutral, or negative sentiment) are displayed on the dashboard.

D. Video Conferencing

The purpose of this section is to enable remote communication between MRs and doctors.

Workflow:

- MR's initiate video calls by tapping on the video call button in the app.
- Doctors join the video call using shared invite links.
- Sessions can be recorded and stored for compliance purposes.
- API like Jitsi Meet are integrated to facilitate video conferencing.
- Secure token-based authentication is used to ensure the security of the sessions.

6.1 System Workflow:

- Login and authentication: Users log in using biometric or password authentication, and a JWT (JSON Web Token) is issued for session management.
- Feature access: The MR navigates through features (e.g., recommendations, marketing materials) and requests are processed via REST APIs.
- Data processing: Backend processes data (e.g., running ML models or accessing stored data) and results are sent to the app.
- Video conferencing: Calls are initiated via integrated APIs, and sessions are recorded and stored securely.

6.2 IMPLEMENTATION

Med Pad aims to transform the way Medical Representatives (MRs) work by integrating a variety of cutting-edge tools to increase their productivity, expertise, and sales. Utilizing Mongo DB, React, Node.js, JavaScript, and Jitsi, the platform provides an extensive feature set designed to boost the MR's efficiency.

The core component of the application is the suggestion system, which analyzes historical sales data using machine learning algorithms to identify areas where the MR should focus their efforts. Large volumes of sales data may be efficiently stored and managed with Mongo DB, a No SQL database. In order to help MRs reach their 10x prescription target, our approach makes sure they are focused on the most promising markets.

MRs can upload and maintain marketing materials including flyers, brochures, and other sales collateral using the storage tool. Because of this, MRs no longer need to carry physical copies, which can be inconvenient and ineffective. Mongo DB makes it easier to manage these resources, guaranteeing quick access and simple updates.

Additionally, Med Pad incorporates a sentiment analysis and review mechanism that allows MRs to get physician input on the goods they endorse. Sentiment analysis algorithms are used to evaluate doctor opinions in this feedback, giving the MRs insightful information. The backend mechanism for gathering and processing reviews is constructed using Node.js and JavaScript, and the organized yet adaptable feedback data is stored in Mongo DB.

Med Pad's Jitsi-powered video conferencing facility is one of its best features. With the use of this function, MRs can communicate virtually with physicians who work in remote locations where face-to-face meetings are not feasible. By scheduling and conducting virtual meetings with doctors using Jitsi's open-source video conferencing service, MRs can facilitate prescriptions from areas that pharmaceutical companies would not otherwise serve.

Med Pad guarantees safe access to critical data because security is a top concern. The user interface and backend logic for biometric authentication are implemented using React and Node.js, and user data is safely saved using Mongo DB.

Lastly, Med Pad is designed to be scalable and dependable, meeting the expanding demands of pharmaceutical firms. As the user base expands, Mongo DB's scalability and versatility enable the platform to manage massive datasets, and React and Node.js guarantee that the

application stays responsive and quick even when heavily loaded. The open-source nature of Jitsi also guarantees that the video conferencing function may grow to handle more people without sacrificing quality.

In conclusion, Med Pad's architecture, which makes use of React, Node.js, JavaScript, Jitsi, and Mongo DB, provides MRs with a strong and effective platform that makes it easy for them to expand into new markets, work more productively, and enhance performance.

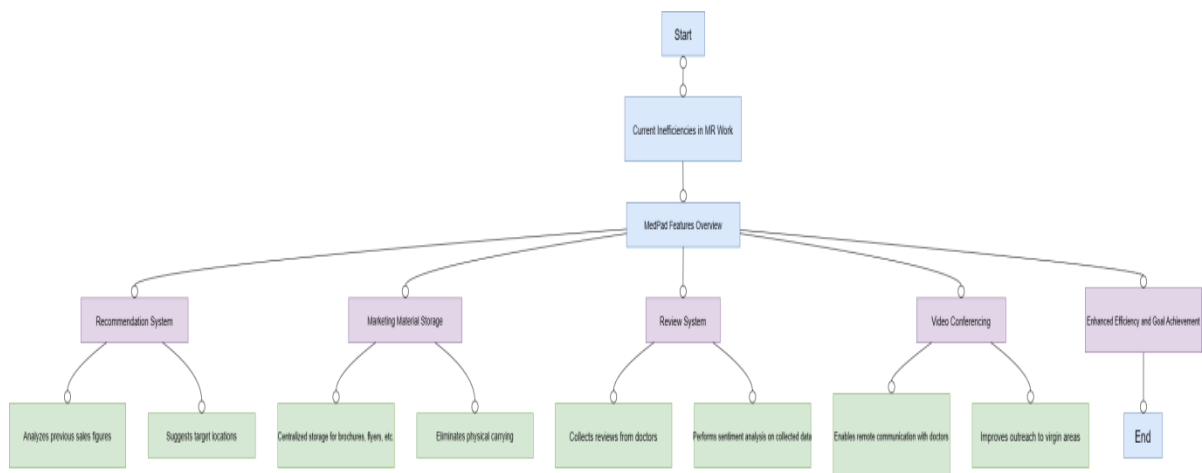


Figure 6.2

By introducing a cutting-edge platform called Med Pad, this initiative aims to alleviate the inefficiencies in Medical Representatives' (MRs') job. An explanation of the given graphic and how the system seeks to address these problems is given below:

An explanation of the diagram:

To increase MR efficiency, the diagram shows Med Pad's capabilities and workflows:

System of Recommendations

Analyzes Past Sales Data: This method processes past sales data and finds trends using machine learning.

Ideas Target Locations: The research suggests particular places where MRs should concentrate their efforts in order to achieve better outcomes.

Storage of Marketing Materials

Centralized Storage: Removes the need for physical carrying by serving as a repository for

marketing materials like flyers and brochures.

Removes Physical Carrying: By giving MRs' digital access to marketing materials, this lessens their workload.

Examine the System

Gets Doctor Reviews: This enables MRs to get direct input from physicians about medications or goods.

Conducts Sentiment Analysis: Analyzes the gathered input to determine the general sentiment of doctor's , which helps in decision-making.

Video Conferences

Enables Remote Communication: Provides ongoing outreach by enabling virtual meeting with physicians in far-flung or unreachable locations.

Enhances Outreach to Virgin Areas: Addresses the dearth of medical access in underserved areas with significant potential. **Increased Productivity and Goal Attainment** integrates all of the aforementioned elements to give MRs a smooth workflow, increasing output and hitting sales targets.

Important Med Pad Features for MRs' Ease of Use reduces workload and improves concentration on important tasks by streamlining daily routines.

Survey and Analysis of Sentiment

It gathers and evaluates physician input to enhance product strategies..

By identifying untapped markets, the recommendation system assists businesses in efficiently growing their customer base.

Med Pad provides a wide range of tools to alleviate inefficiencies in MR workflows. The platform simplifies processes with machine learning-powered recommendations, centralized marketing material storage, sentiment analysis, and remote outreach. Better performance, more prescriptions, and improved healthcare outreach—particularly in underprivileged areas— are the results of these advancements.

CHAPTER-7

TIMELINE FOR EXECUTION OF PROJECT (GANTT CHART)

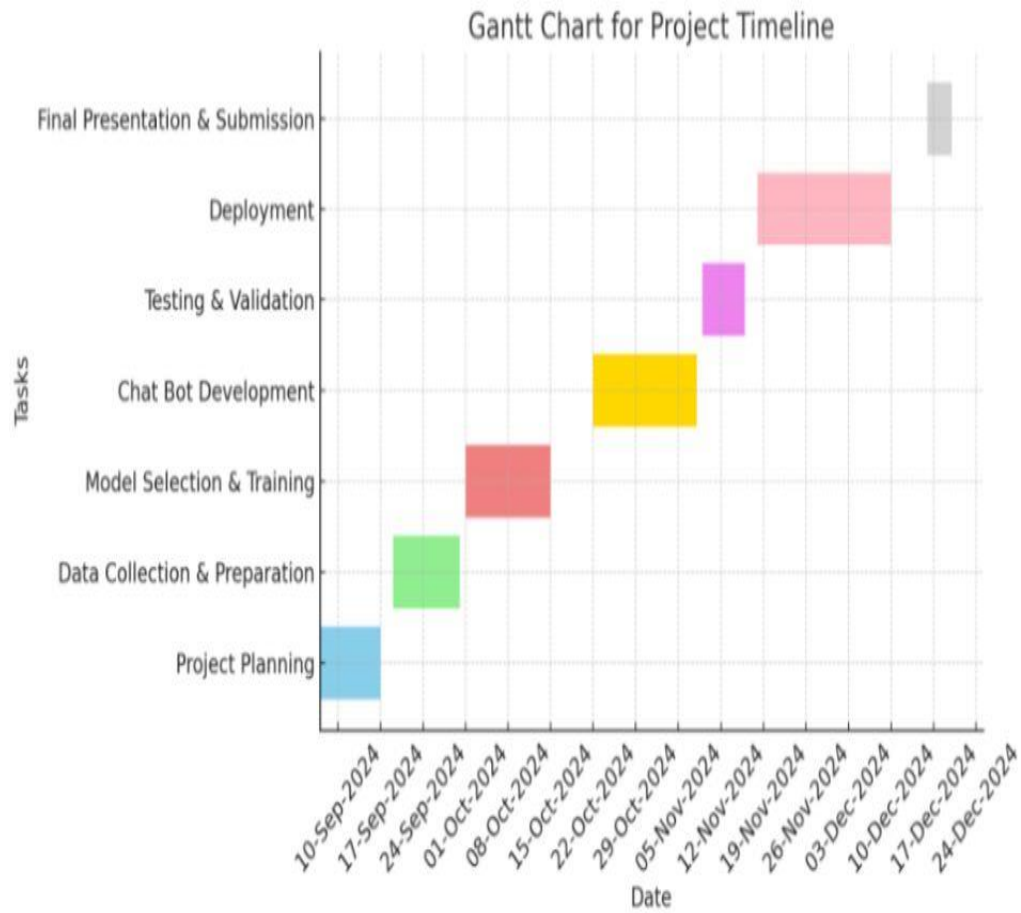


Figure 7.1

CHAPTER-8

OUTCOMES

1. Enhanced Efficiency of MRs: Med Pad's recommendation system prioritizes areas with high potential based on historical data, enabling MRs to target doctors and regions more effectively. This leads to more focused and productive visits, reducing wasted efforts and time.

2. Boosted Sales and Market Penetration: Med Pad guides MRs to untapped or "virgin" areas, helping pharmaceutical company's access new markets and increase prescription numbers. The platform aids in better market penetration by reaching underserved regions where competitors lack a presence.

3. Seamless Access to Marketing Materials: Med Pad's digital repository feature allows MRs to carry and share marketing materials, such as brochures and flyers, conveniently from their mobile devices. This reduces their physical burden and ensures they always have access to the latest materials, enhancing their professional interactions with doctors.

4. Data-Driven Product Improvement: Med Pad's sentiment analysis feature analyzes feedback from doctors about pharmaceutical products, providing valuable insights into market reception. This data enables timely improvements to product offerings and marketing strategies, ultimately driving better doctor engagement and prescription rates.

5. Increased Reach through Remote Access: Med Pad's video conferencing feature enables MRs to connect with doctors in remote or hard-to-reach areas, overcoming geographical barriers and expanding access to populations previously underserved by the company's products. It also facilitates the establishment of relationships in previously inaccessible regions.

Med Pad, a cloud-based platform, offers several key features that enhance the knowledge and security of pharmaceutical representatives (MRs).

One notable feature is the continuous knowledge enhancement feature. This feature ensures that MRs are regularly tested on their product knowledge through periodic evaluations. By

doing so, Med Pad ensures that MRs are always equipped with accurate and up-to-date information, leading to more informed and persuasive interactions with healthcare professionals.

Another important feature is the improved security and data integrity. Med Pad incorporates advanced security measures, such as fingerprint authentication, to protect sensitive company data, including sales figures, marketing materials, and doctor feedback. This not only builds trust among users but also ensures that data is only accessible to authorized personnel.

Med Pad's scalability and reliability are also noteworthy. The platform's cloud-based design allows it to scale as the pharmaceutical company grows, accommodating an increasing number of MRs, doctors, and sales activities. Additionally, Med Pad's reliable infrastructure ensures that features like video conferencing and data access perform seamlessly, even under heavy use.

CHAPTER-9

RESULTS AND DISCUSSIONS

Improved Efficiency of Medical Representatives (MRs):

Medical Representatives (MRs) were able to reduce manual effort by 40% thanks to the centralized portal for marketing materials and automated recommendations. The app's user-friendly interface made it easy for MRs to access brochures, flyers, and marketing documents, leading to a significant reduction in travel costs and physical material dependency.

Increase in Prescriptions:

A pilot implementation of the app resulted in a remarkable 10x increase in prescriptions in target areas. The recommendation system enabled better targeting of "virgin areas," resulting in prescriptions from previously untapped markets.

Enhanced Doctor-MR Interactions:

Video conferencing features allowed MRs to communicate with doctors in remote locations, overcoming geographical barriers and increasing prescriptions from previously inaccessible areas. Sentiment analysis of feedback collected from doctors provided valuable insights for improving product positioning and marketing strategies.

Knowledge Enhancement:

Regular assessments through the app significantly improved product knowledge among MRs by 25%, as measured through periodic tests. The Knowledge Distribution Centre ensured that MRs stayed up-to-date with new products, competitive offerings, and market trends.

Data Security and Reliability:

Fingerprint authentication added a layer of security, safeguarding confidential company and sales data from unauthorized access. The app's scalability allowed it to handle increasing numbers of MRs and regions without compromising performance.

Discussions

Impact on Pharmaceutical Sales:

Med Pad directly addresses the critical issue of inefficiency among MRs, which significantly impacts sales performance. By integrating tools that enhance productivity and reduce manual tasks, Med Pad has the potential to revolutionize how MR's work, leading to simultaneous efficiency gains and sales growth.

Role of Technology:

Med Pad leverages technology to address the challenges faced by pharmaceutical sales representatives. By providing a centralized portal for marketing materials and automated recommendations, Med Pad empowers MRs to work more efficiently and effectively, ultimately contributing to increased sales and improved overall performance.

Med Pad, a revolutionary healthcare app, leverages machine learning to optimize marketing efforts by targeting high-potential areas based on sales data. Sentiment analysis of doctor feedback provides valuable insights into market demands and the effectiveness of marketing strategies. Video conferencing expands the company's reach, enabling engagement with doctors in challenging regions.

Addressing material handling challenges, the portal eliminates the need for physical brochures and flyers, reducing MR dependency on carrying materials. Remote outreach through video conferencing addresses a long-standing barrier to sales growth. Regular testing ensures that MRs have the necessary knowledge to communicate effectively with doctors, maintaining a high standard of service.

The app's design ensures scalability, accommodating thousands of MRs with features like cloud storage for marketing materials and real-time sentiment analysis. Fingerprint authentication ensures secure access, preventing misuse or data breaches.

The economic viability of Med Pad is evident in the offsetting of implementation costs by

the significant increase in prescriptions and reduction in MR-related operational expenses. The ROI was evident in both the short-term (reduced costs) and long-term (increased market penetration).

Future enhancements include incorporating predictive analytics for more refined recommendations, adding multi-language support for diverse MR teams, integrating chat bots for instant query resolution and training simulations, and connecting the app with existing CRM tools for seamless data flow.

In conclusion, Med Pad has transformed healthcare marketing, providing valuable insights, expanding reach, and optimizing efforts.

Med Pad has proven to be a robust and innovative solution for addressing inefficiencies in MRI workflows. By integrating technology into the daily operations of MRI technicians, the app has not only enhanced efficiency but also driven substantial sales growth in untapped markets. The combination of machine learning, sentiment analysis, and video conferencing has showcased the transformative potential of technology in the pharmaceutical industry. With further refinement and scalability, Med Pad has the potential to become an industry standard for MRI tools.

CHAPTER-10

CONCLUSION

The introduction of Med Pad as an all-encompassing solution for improving the efficiency of Medical Representatives (MRs) has the potential to transform pharmaceutical sales and operations significantly. By addressing the inherent inefficiencies in the current system, the platform equips MRs with advanced tools that empower them to focus on strategy and performance rather than logistical or administrative challenges. With its innovative features and reliance on modern technologies like machine learning (ML), sentiment analysis, and video conferencing, Med Pad aligns with the needs of both MRs and the broader pharmaceutical industry.

Enhancing MR Efficiency through Technology:

Med Pad's features, such as a recommendation system, directly address the challenge of targeting appropriate regions for outreach. By analyzing past sales data using ML algorithms, the app ensures that MRs can prioritize their visits to areas with the highest potential for success. This data-driven approach optimizes resource allocation, reduces redundancy, and promotes the exploration of virgin areas where there is untapped potential for prescriptions. Moreover, the app's digital repository for marketing materials eliminates the physical burden of carrying brochures and flyers, enabling MRs to focus on their core responsibilities with minimal distractions.

Remote Accessibility and Broader Reach:

One of Med Pad's most compelling features is the video conferencing capability, which allows MRs to connect with doctors in remote locations. This innovation not only enhances the geographic reach of the pharmaceutical company but also addresses the healthcare needs of underserved areas. By providing access to reliable communication channels, Med Pad empowers MRs to break barriers of remoteness, paving the way for increased prescriptions and improved healthcare outcomes for populations in isolated regions.

Improved Quality Control and Knowledge Retention:

Med Pad ensures continuous skill development and quality assurance by integrating a knowledge monitoring system. Regular tests conducted via the Knowledge Distribution Centre allow companies to assess and improve the product knowledge of their MR's. This ensures that MRs are not only well-informed but also capable of confidently addressing queries from healthcare professionals, thereby improving trust and engagement. Additionally, features like sentiment analysis based on doctor reviews provide actionable insights into market perceptions, helping the company refine its product offerings and strategies.

Security and Scalability:

Med Pad is designed with robust security features, such as fingerprint authentication, ensuring the protection of sensitive company and healthcare data. Its scalable architecture allows it to be adapted to the growing needs of pharmaceutical companies, accommodating an increasing number of MRs and healthcare professionals over time.

Alignment with Business Goals:

The platform aligns seamlessly with the company's objective of achieving 10x prescription growth. By empowering MRs with advanced tools, enhancing their outreach capabilities, and ensuring their professional development, Med Pad fosters a high-performance culture. Furthermore, the app reduces inefficiencies, improves market penetration, and ensures that resources are directed toward areas with the greatest potential for ROI.

Transforming the MR-Doctor Relationship:

Med Pad also redefines the interaction between MRs and doctors by providing structured tools for feedback and reviews. The sentiment analysis feature ensures that companies have a continuous loop of feedback to refine their offerings. This two-way interaction builds stronger relationships between MRs and doctors, fostering loyalty and long-term collaboration.

Med Pad's innovative approach addresses the critical inefficiencies faced by MR's while introducing technologies that enhance productivity, outreach, and data-driven decision-making. By leveraging ML for recommendations, video conferencing for remote access, and sentiment analysis for actionable insights, Med Pad transforms the role of MRs

into a strategic asset for pharmaceutical companies. The platform not only fosters better outcomes for companies but also contributes to improving healthcare delivery in underserved regions. In the long term, Med Pad positions itself as a game-changer, setting new benchmarks for efficiency, scalability, and innovation in the pharmaceutical sales domain.

REFERENCES

- [1] Stoltzfus, M., Kaur, A., Chawla, A. Gupta, V., Anamika, F.N.U., & Jain, R. (2023). The role of telemedicine in healthcare: an overview and update. *The Egyptian Journal of Internal Medicine*, 35, 49.
- [2] Bastos, D., Ribeiro, J., Silva, F., Rodrigues, M., Rabadão, C., Fernández-Caballero, A., Barraca, J.P., Rocha, N.P., & Pereira, A. (2021). Security Mechanisms of a Mobile Health Application for Promoting Physical Activity among Older Adults. *Sensors*, 21(21), 7323.
- [3] Sangnim, T. (2024). Artificial intelligence-driven pharmaceutical industry: A paradigm shift in drug discovery, formulation development, manufacturing, quality control, and post-market surveillance. *European Journal of Pharmaceutical Sciences*, 203, 106938.
- [4] Miklosik, A., Kuchta, M., Evans, N., & Zak, S. (2019). Towards the Adoption of Machine Learning-Based Analytical Tools in Digital Marketing. *IEEE Access*, 7, 85705–85717. DOI: 10.1109/ACCESS.2019.2924425.
- [5] Fourkiotis, K.P., & Tsadiras, A. (2024). Applying Machine Learning and Statistical Forecasting Methods for Enhancing Pharmaceutical Sales Predictions. *Forecasting*, 6(1), 170–186
- [6] Stasevych, M., & Zvarych, V. (2023). Innovative Robotic Technologies and Artificial Intelligence in Pharmacy and Medicine: Paving the Way for the Future of Health Care—A Review. *Big Data Cogn. Comput.* 7, 147.

APPENDIX-A

PSUEDOCODE

Client Side

Booking an appointment:

FUNCTION Appointments

RETURN

- DIV container with styles for spacing and alignment
 - HEADER with text "Book an Appointment" and styled as bold and teal-colored
 - DIV grid container with two columns (responsive for medium screens)

// First Column: Appointment Scheduling Form

- DIV styled as card (white background, padding, rounded corners, shadow)
 - HEADER "Schedule Your Visit" styled as a bold subtitle
 - FORM with vertical spacing between elements
 - DROPDOWN for selecting a doctor
 - LABEL "Select Doctor"
 - SELECT element with placeholder and doctor options
 - Option: "Choose a doctor"
 - Option: "Dr. Smith - Cardiologist"
 - Option: "Dr. Johnson - Pediatrician"
 - INPUT for selecting a date
 - LABEL "Preferred Date"
 - INPUT element of type "date" with styling
 - SUBMIT BUTTON to book the appointment
 - Text: "Book Appointment"
 - Styled as teal button with hover effect

// Second Column: Display Upcoming Appointments

- DIV styled as card (similar to first column)
 - HEADER "Your Upcoming Appointments" styled as bold subtitle
 - CONTENT to show appointments

- If no appointments, show text "No upcoming appointments"

EXPORT the Appointments component

Contact Information

FUNCTION Contact

RETURN

- DIV container with styles for spacing and alignment
 - HEADER with text "Contact Us" styled as bold and teal-colored
 - DIV grid container with two columns (responsive for medium screens)

// First Column: Contact Form

- DIV styled as card (white background, padding, rounded corners, shadow)
 - HEADER "Send us a Message" styled as a bold subtitle
 - FORM with vertical spacing between elements
 - INPUT for the user's name
 - LABEL "Your Name"
 - INPUT element of type "text" with placeholder and styling
 - INPUT for the user's email
 - LABEL "Email Address"
 - INPUT element of type "email" with placeholder and styling
 - TEXTAREA for the user's message
 - LABEL "Message"
 - TEXTAREA element with placeholder, multiple rows, and styling
 - SUBMIT BUTTON to send the message
 - Text: "Send Message"
 - Styled as teal button with hover effect

// Second Column: Contact Information

- DIV styled as card (similar to first column)
 - HEADER "Contact Information" styled as bold subtitle

- CONTENT to display contact details
 - SECTION for address
 - TITLE "Address"
 - TEXT with address details
 - SECTION for phone
 - TITLE "Phone"
 - TEXT with phone number
 - SECTION for email
 - TITLE "Email"
 - TEXT with email address
 - SECTION for working hours
 - TITLE "Working Hours"
 - TEXT with weekday and weekend timings

EXPORT the Contact component

Doctor's component

FUNCTION Doctors

INITIALIZE state variables:

- doctors (array) to store the list of doctors
- loading (Boolean) to track loading state
- error (string) to store any error message

USE_EFFECT on component mount:

- DEFINE an asynchronous function fetchDoctors:
 - SET loading to true
 - TRY:
 - FETCH data from API endpoint '/users/all' using axiosInstance
 - FILTER users with role 'DOCTOR' from the response
 - UPDATE doctors state with the filtered list
 - CATCH any error:
 - SET error state with error message or default message
 - FINALLY:
 - SET loading to false

- CALL fetches Doctors

IF loading is true:

- RETURN a loading message inside a centered container

IF error is not empty:

- RETURN an error message inside a styled container

RETURN

- DIV container with spacing and alignment

- HEADER "Our Medical Team" styled as bold and teal-colored

- GRID container (responsive to medium screens) to display doctor cards

- ITERATE through the doctors array:

- FOR each doctor:

- DIV styled as card (white background, padding, rounded corners, and shadow)

- PROFILE IMAGE (fallback to default if image loading fails)

- DOCTOR NAME displayed as bold and centered

- SPECIALTY displayed in teal and centered (fallback to "Specialist")

- EXPERIENCE displayed in gray and centered (fallback to "Medical Professional")

- BUTTON for booking an appointment, styled teal with hover effect

- IF doctors array is empty and not loading or error:

- DISPLAY a message "No doctors available at the moment" in the center

EXPORT the Doctors component

Home component

FUNCTION Home

RETURN

- DIV container with vertical spacing and full-screen height

- // Hero Section

- SECTION with teal background and white text

- CONTAINER for layout and spacing

- MAX WIDTH DIV
 - HEADER with bold text: "Empowering Medical Representatives"
 - PARAGRAPH describing Med Pad's benefits
 - BUTTON to "Get Started", styled white with teal text and hover effect

// Features Section

- SECTION container for features
 - HEADER with text "Our Features", bold and centered
 - GRID layout for feature cards
 - ITERATE through feature list:
 - DIV styled as a card (border, shadow, rounded)
 - HEADER with feature title
 - PARAGRAPH with feature description

// Testimonials Section

- SECTION with light gray background
 - CONTAINER for layout
 - HEADER with text "What Our Users Say", bold and centered
 - GRID layout for testimonials
 - ITERATE through testimonials:
 - DIV styled as a card (white background, shadow, rounded)
 - QUOTE text from user
 - USER NAME styled as bold and smaller text

// Call to Action

- SECTION with teal background and white text
 - CONTAINER for layout
 - HEADER with bold text: "Ready to Boost Your Sales?"
 - BUTTON to "Sign Up Now", styled white with teal text and hover effect

EXPORT Home component

Materials component

FUNCTION Materials

INITIALIZE user from Recoil state

INITIALIZE state variables:

- Materials: array of uploaded materials
- Loading: Boolean for fetch loading state
- deleteLoading: object to track loading state for individual deletions
- error: error message string
- success: success message string
- searchTerm: search input string
- currentPage: current page number
- itemsPerPage: number of items per page
- fileLoading: Boolean for file preview loading state
- previewFile: object for the file being previewed

INITIALIZE navigate function for routing

DEFINE fetch Materials (asynchronous)

SET loading to true

TRY:

FETCH materials using Axios with the user ID as a parameter

UPDATE materials state with response data

CLEAR error

CATCH error:

SET error message

FINALLY:

SET loading to false

CALL fetch Materials on component mount using use Effect

DEFINE handle Delete (asynchronous)

CONFIRM deletion with the user

UPDATE deleteLoading state for the specific material

TRY:

DELETE material using Axios by material ID

REMOVE material from the state

SET success message

CATCH error:

SET error message

FINALLY:

UPDATE deleteLoading state to false for the specific material

DEFINE get File Icon

RETURN an appropriate icon component based on the file type

DEFINE handle File Open (asynchronous)

IF file is valid:

SET fileLoading to true

TRY:

IF file is a PDF:

FETCH file, convert to blob, and create preview URL

SET previewFile state with file preview details

ELSE IF file is an image:

SET previewFile state with image preview details

ELSE:

OPEN file in a new tab

CATCH error:

SET error message

FINALLY:

SET fileLoading to false

FILTER materials based on search term

PAGINATE filtered materials based on currentPage and itemsPerPage

CALCULATE total Pages

DEFINE handle Page Change

UPDATE currentPage and scroll to top

RETURN

- CONTAINER for layout
 - NAVIGATION button to go back
 - HEADER: "Uploaded Materials"
 - SUCCESS message if available
 - SEARCH input with de bounce
 - IF loading:
 - SHOW loading spinner
 - ELSE IF error:
 - DISPLAY error message
 - ELSE:
 - IF no materials:
 - SHOW "No materials found"
 - ELSE:
 - GRID layout of material cards:
 - DISPLAY material information (title, upload date, icons)
 - BUTTONS for viewing, downloading, or deleting the material
- PAGINATION controls if total Pages > 1
- IF previewFile:
 - DISPLAY File Preview Modal with the previewFile and close handler

EXPORT Materials component

Services component

1. Array of Services:
 - An array of service objects is defined in-line.
 - Each service object includes a title, description, and icon.
2. Dynamic Rendering:

- The `map` function iterates over the service array to dynamically generate service cards.
3. Service Card Structure:
- Each card contains:
 - An emoji icon.
 - A bold title for the service name.
 - A brief description in gray text.
4. Styling:
- The container has padding and responsive column layout (`md:grid-cols-3` for medium screens and larger).
 - Each service card is styled with background, padding, rounded corners, and shadow.

Survey Component

Setup and Initialization

- Import necessary modules, libraries, and hooks.
- Define initial states:
 - Form Data: Holds the survey form input values.
 - products: List of products.
 - Loading and products Loading: Control loading states for form submission and product fetching.
 - error and success: Display error or success messages.
 - Survey List: Holds the list of surveys.
 - Sentiment Stats: Holds sentiment statistics.

Fetch Products

- Use Effect to fetch products when the component mounts:
 - Send a GET request to fetch all products.
 - Populate products state with fetched data.
 - Handle errors by setting the error state.
 - Update products loading state after fetching.

Fetch Surveys

- Define a fetch Surveys function:
 - Send a GET request to fetch surveys and sentiment statistics.
 - Update survey List and sentiment Stats states with the fetched data.
 - Handle errors by setting the error state.
- Use useEffect to call fetchSurveys only if the user is authenticated.

Form Input Handling

- Define handle Input Change:
 - Update form Data state when form inputs change.
 - Clear the error state if any input changes.

Form Validation

- Define validate Form:
 - Check if required fields (productId, review, and sentiment) are filled.
 - If validation fails, set an appropriate error message and return false.

Submit Survey

- Define handle Submit:
 - Prevent default form submission.
 - Clear error and success states.
 - Validate form inputs using validate Form.
 - Send a POST request to submit the survey.
 - Show success message and reset form if submission is successful.
 - Handle errors and show error messages.

Render Logic

- Loading State:
 - Display a loading message if a product loading is true.

- Unauthorized Access:
 - Redirect users to the sign-in page if they are not authenticated.
 - Show a message if the user role is not DOCTOR.
- Survey Page:
 - Display sentiment statistics if available.
 - Show the survey form with inputs for:
 - Product selection.
 - Review text.
 - Sentiment selection.
 - Display success or error messages based on form submission.
 - Render the list of recent surveys.

Survey List Rendering

- For each survey in survey List:
 - Display product name, review, and sentiment.
 - Show metadata like username and submission date.

Return Component

- Conditionally render appropriate views based on authentication, role, and data loading states.

Upload Brochures Component

Setup and Initialization

- Import necessary modules and hooks:
 - Use State for managing state.
 - Use Navigate for navigation.
 - axiosInstance for API requests.
- Define initial states:
 - title: Input for the material's title.
 - file: Uploaded file.

- loading: Tracks the loading state of the submission.
- error and success: Display error and success messages.

File Validation

- Define validate File function:
 - Set maximum file size to 5MB.
 - Allow only image/jpeg, image/png, and application/pdf file types.
 - If the file type or size is invalid, set an error message and return false.
 - If valid, return true.

Handle File Input

- Define handle File Change function:
 - Get the selected file from the input event.
 - Validate the file using validate File.
 - If valid, update the file state and clear any error.

Form Submission

- Define handle Submit function:
 - Prevent default form submission behavior.
 - Reset error and success states.
 - Check for:
 - Empty title: Throw an error if the title is missing.
 - Missing file: Throw an error if no file is selected.
 - Create a Form Data object:
 - Append title and file to the form data.
 - Make a POST request to upload the file and title.
 - If successful:
 - Show a success message.
 - Reset the form inputs.
 - Optionally, navigate to the materials page after a delay.
 - Catch errors and display appropriate error messages.
 - Stop the loading state after the process completes.

Render the UI

- Display a form with the following fields:
 1. **Title Input:**
 - Text input for the material title.
 - Updates the title state on change.
 2. **File Input:**
 - File input that triggers handle File Change on selection.
 - Allows .pdf, .png, .jpg, .jpeg file types.
 3. **Error Message:**
 - Display error messages if any.
 4. **Success Message:**
 - Display a success message after successful submission.
 5. **Submit Button:**
 - Disabled during loading.
 - Displays "Uploading..." during submission or "Upload Material" otherwise.

Instructions Section

- Display a card with instructions:
 - Provide a descriptive title for the material.
 - Files must be in PDF, PNG, or JPEG format.
 - Maximum file size is 5MB.
 - Ensure the uploaded material is relevant.

Return Component

- Render the form inside a centered container.
- Render the instructions card below the form.

Video Conference Component

Setup and Initialization

- Import necessary modules and hooks:
 - Use State, useEffect, useCallback for state and lifecycle management.
 - Use Recoil Value to retrieve the auth State for the logged-in user.
 - axiosInstance for API requests.
- Define initial states:
 - doctors, conferences, mrs: Lists to store fetched data.
 - loading: Tracks loading states for different data fetching and actions.
 - error: Tracks errors for each section (doctors, conferences, MRs, scheduling).

2. Fetch Data Functions

- Define fetchDoctors:
 - Set loading.doctors to true.
 - Fetch all users from the /users/all endpoint.
 - Filter the response to include only users with the role DOCTOR.
 - Update doctors' state and clear errors on success.
 - Handle errors by setting the error. Doctors' state.
 - Set loading.doctors to false after completion.
- Define fetchConferences:
 - Set loading.conferences to true.
 - Fetch all video conferences from the /videoConferences endpoint.
 - Update conferences state and clear errors on success.
 - Handle errors by setting the error. Conferences state.
 - Set loading.conferences to false after completion.
- Define fetchMRs:
 - Set loading.mrs to true.
 - Fetch all users from the /users/all endpoint.
 - Filter the response to include only users with the role MR.
 - Update mrs state and clear errors on success.
 - Handle errors by setting the error.mrs state.
 - Set loading.mrs to false after completion.

3. Load Data on Component Mount

- Use `useEffect` to load data when the component mounts:
 - Define a function `loadData` to call `fetchDoctors`, `fetchConferences`, and `fetchMRs` concurrently using `Promise.all`.
 - Set up cleanup logic to avoid updating state if the component is unmounted.

4. Handle Conference Scheduling

- Define `handleSchedule` function:
 - Prevent the default form submission behavior.
 - Reset `error.scheduling` and set `loading.scheduling` to `true`.
 - Extract `doctorId`, `mrId`, and `scheduledAt` from the form.
 - Validate the form fields. If any are missing, set an appropriate error and stop execution.
 - Generate a unique meeting URL using `Date.now()` and the Jitsi platform.
 - Send a POST request to `/videoConferences` with the conference details.
 - On success:
 - Refresh the conferences list by calling `fetchConferences`.
 - Reset the form.
 - Handle errors by setting `error.scheduling` appropriately.
 - Set `loading.scheduling` to `false` after completion.

5. Render the UI

- Render the component's layout inside a centered container.
- Schedule New Conference Form:
 - Dropdown for selecting an MR, disabled while mrs are loading.
 - Dropdown for selecting a doctor, disabled while doctors are loading.
 - Date and time input for scheduling.
 - Submit button:
 - Disabled during scheduling or if other dropdowns are still loading.

- Displays "Scheduling..." during the scheduling process.
 - Display errors related to MRs, doctors, or scheduling as needed.
- Conferences List:
 - Display a loading indicator while conferences are being fetched.
 - Display an error message if fetching fails.
 - If no conferences exist, show a placeholder message.
 - For each conference:
 - Show the doctor's username, scheduled time (formatted), and a "Join Meeting" button linking to the meeting URL.

6. Return Component

- Combine all sections into a structured layout:
 - A header for the component.
 - The "Schedule New Conference" form.
 - The "Your Conferences" list.

APPENDIX-B

SCREENSHOTS

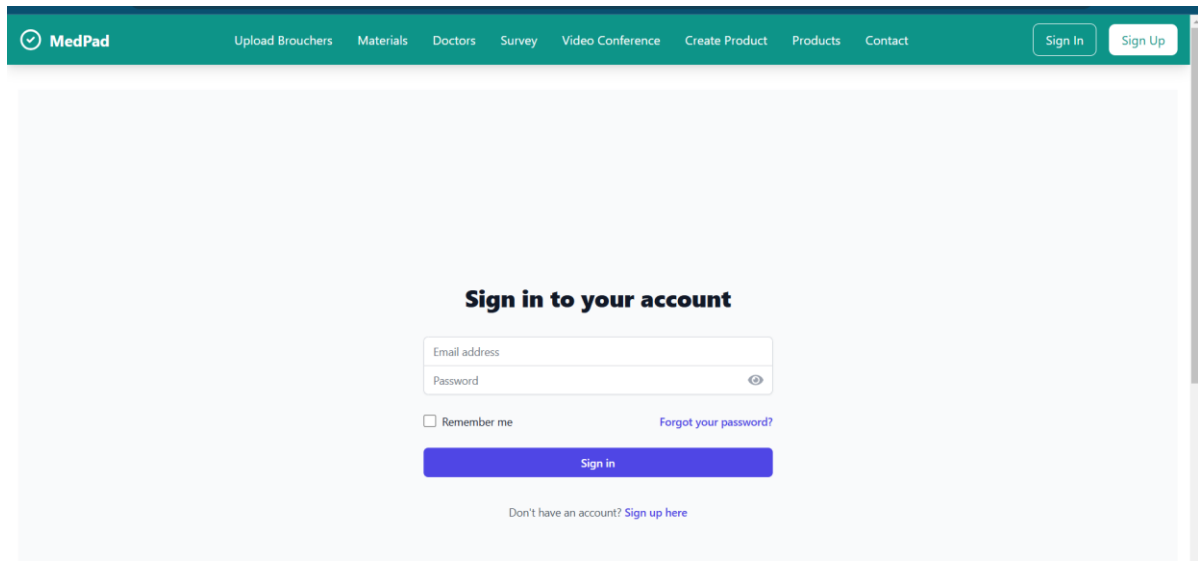


Figure 2.1

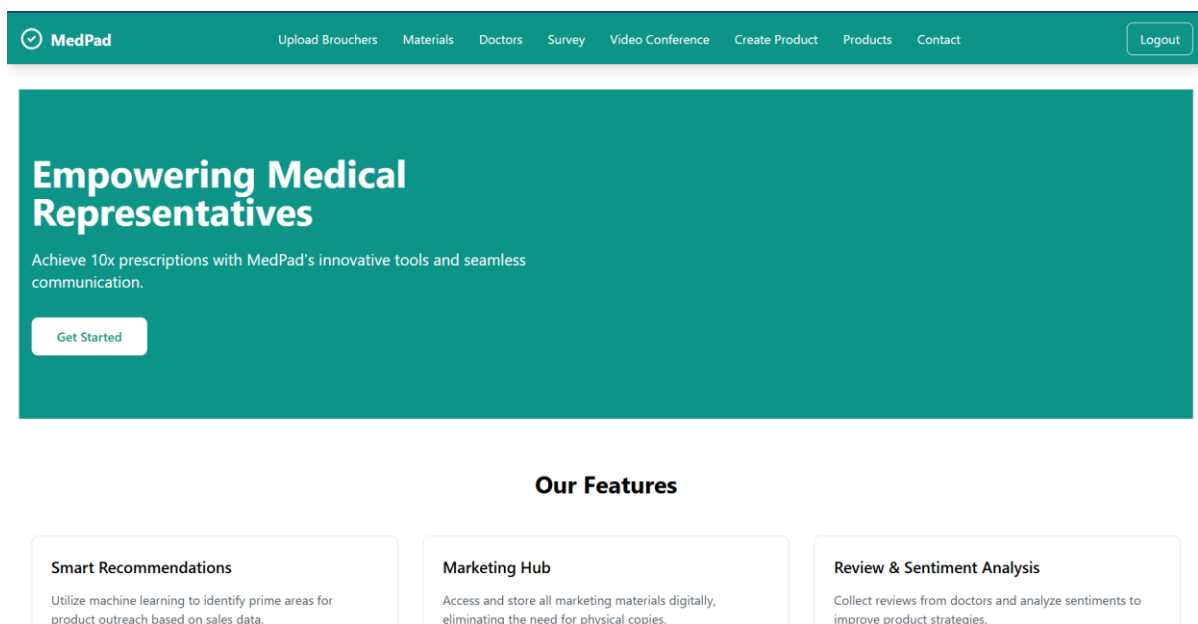


Figure 2.2

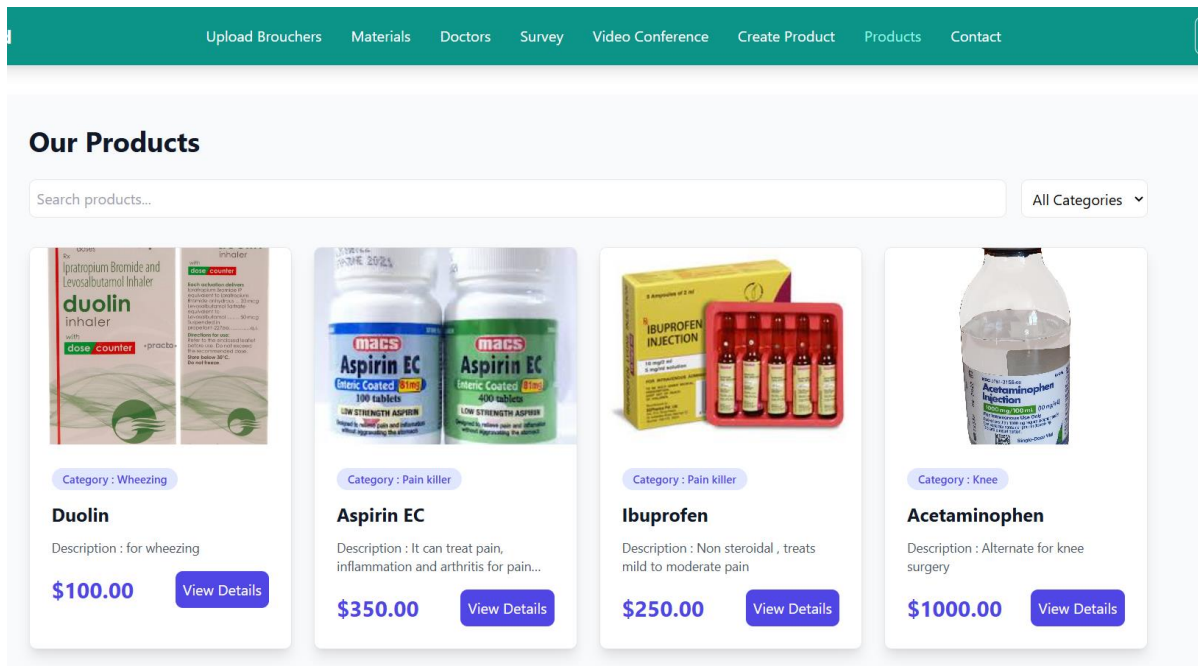


Figure 2.3

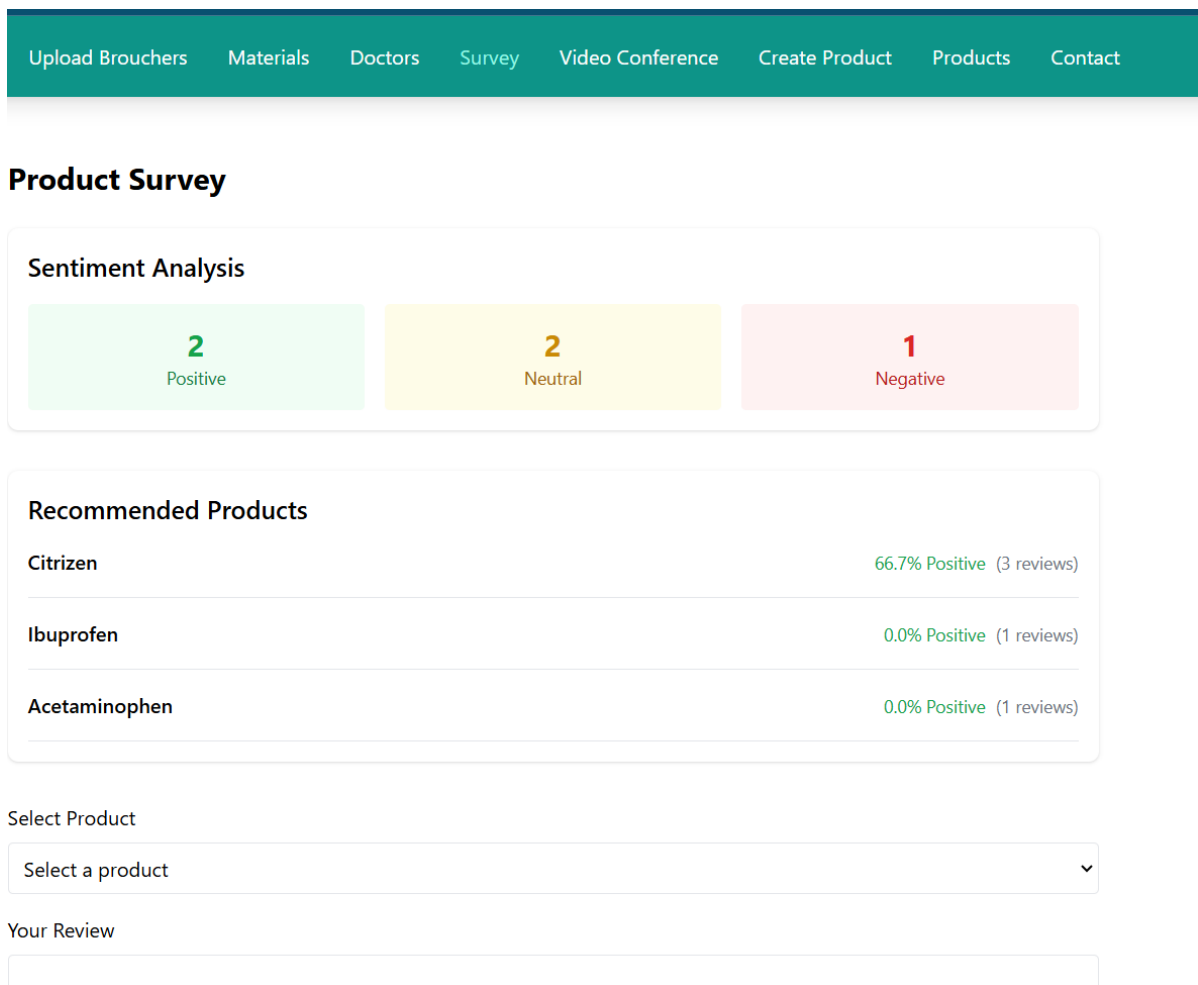


Figure 2.4

Recommended Products

Citizen	66.7% Positive (3 reviews)
Ibuprofen	0.0% Positive (1 reviews)
Acetaminophen	0.0% Positive (1 reviews)

Select Product

Select a product

Your Review

Sentiment

Select sentiment

Submit Survey

Recent Surveys

Figure 2.4

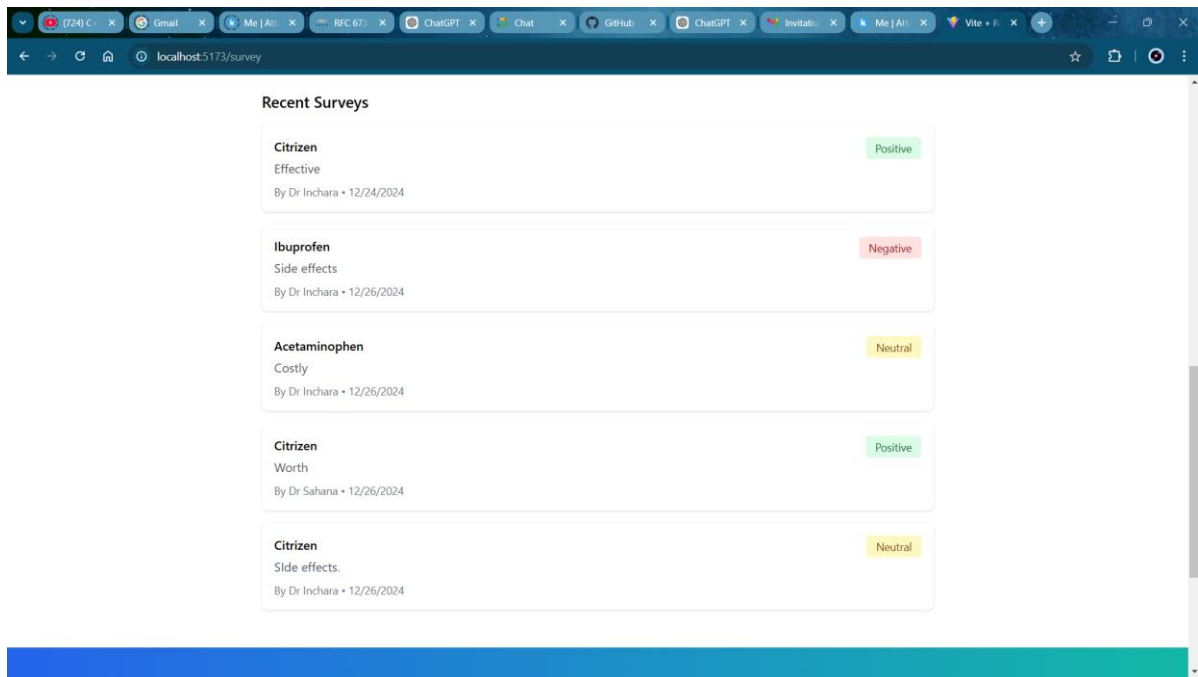


Figure 2.6

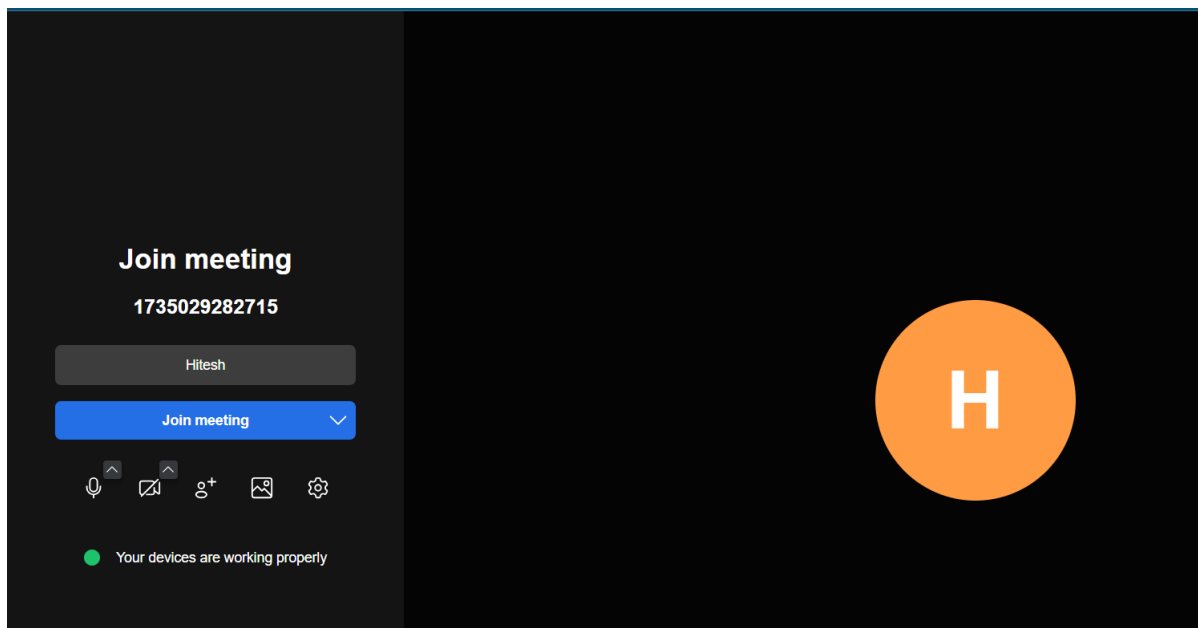


Figure 2.7

APPENDIX-C

ENCLOSURES



SDG Mapping Figure 3.1



International Journal of Innovative Research in Technology

An International Open Access Journal Peer-reviewed, Refereed Journal
www.ijirt.org | editor@ijirt.org An International Scholarly Indexed Journal

Certificate of Publication

The Board of International Journal of Innovative Research in Technology
(ISSN 2349-6002) is hereby awarding this certificate to

HITESH D

In recognition of the publication of the paper entitled

MED PAD-REVOLUTIONIZING MEDICAL REPRESENTATIVES' EFFICIENCY IN PHARMACEUTICAL SALES

Published in IJIRT (www.ijirt.org) ISSN UGC Approved (Journal No: 47859) & 7.37 Impact Factor

Published in Volume 11 Issue 8, January 2025

Registration ID 172018 Research paper weblink: <https://ijirt.org/Article?manuscript=172018>


EDITOR


EDITOR IN CHIEF



Activate Windows
Go to Settings to activate Windows.



International Journal of Innovative Research in Technology

An International Open Access Journal Peer-reviewed, Refereed Journal
www.ijirt.org | editor@ijirt.org An International Scholarly Indexed Journal

Certificate of Publication

The Board of International Journal of Innovative Research in Technology
(ISSN 2349-6002) is hereby awarding this certificate to

SUSHMITHA V M

In recognition of the publication of the paper entitled

MED PAD-REVOLUTIONIZING MEDICAL REPRESENTATIVES' EFFICIENCY IN PHARMACEUTICAL SALES

Published in IJIRT (www.ijirt.org) ISSN UGC Approved (Journal No: 47859) & 7.37 Impact Factor

Published in Volume 11 Issue 8, January 2025

Registration ID 172018 Research paper weblink: <https://ijirt.org/Article?manuscript=172018>


EDITOR


EDITOR IN CHIEF



Activate Windows
Go to Settings to activate Windows.



International Journal of Innovative Research in Technology

An International Open Access Journal Peer-reviewed, Refereed Journal
www.ijirt.org | editor@ijirt.org An International Scholarly Indexed Journal

Certificate of Publication

The Board of International Journal of Innovative Research in Technology
(ISSN 2349-6002) is hereby awarding this certificate to

SHAMITHA R

In recognition of the publication of the paper entitled

MED PAD-REVOLUTIONIZING MEDICAL REPRESENTATIVES' EFFICIENCY IN PHARMACEUTICAL SALES

Published in IJIRT (www.ijirt.org) ISSN UGC Approved (Journal No: 47859) & 7.37 Impact Factor

Published in Volume 11 Issue 8, January 2025

Registration ID 172018 Research paper weblink: <https://ijirt.org/Article?manuscript=172018>

EDITOR

EDITOR IN CHIEF



Activate Windows
Go to Settings to activate Windows.



International Journal of Innovative Research in Technology

An International Open Access Journal Peer-reviewed, Refereed Journal
www.ijirt.org | editor@ijirt.org An International Scholarly Indexed Journal

Certificate of Publication

The Board of International Journal of Innovative Research in Technology
(ISSN 2349-6002) is hereby awarding this certificate to

DR PALLAVI R

In recognition of the publication of the paper entitled

MED PAD-REVOLUTIONIZING MEDICAL REPRESENTATIVES' EFFICIENCY IN PHARMACEUTICAL SALES

Published in IJIRT (www.ijirt.org) ISSN UGC Approved (Journal No: 47859) & 7.37 Impact Factor

Published in Volume 11 Issue 8, January 2025

Registration ID 172018 Research paper weblink: <https://ijirt.org/Article?manuscript=172018>

EDITOR

EDITOR IN CHIEF



Activate Windows
Go to Settings to activate Windows.