

BE PROJECT SEMESTER VII REPORT

for

AI/ML OPTIMIZATION OF MEDICAL COMMERCE

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BACHELOR OF ENGINEERING

IN

COMPUTER ENGINEERING

OF GOA UNIVERSITY



2023-2024

COMPUTER ENGINEERING

PADRE CONCEICAO COLLEGE OF ENGINEERING

VERNA GOA – 403722

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Submitted as a requirement for Semester VII Project examination.

2023-2024

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ACKNOWLEDGMENT

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ABSTRACT

Never before then, in the aftermath of the deadly Covid-19 pandemic, has there ever been a more somber recognition of the of having the required medical equipment, when required. The computing term for this phenomenon is widely referred to as “On-Demand Service”. This painful reality was made evident for the world to see, in the sheer unpreparedness and lack of infrastructure in hospitals all around the world including our home state of Goa. To quote Dr Pratik Sawant of GARD (Goa Association of Resident Doctors), ”It was a combination of lack of personnel, dearth of medical equipment and low supplies of medicines”.

This predicament is inexcusable given the technological advances of the 21st century. Hence it becomes incumbent upon us as Software Professional’s to work towards optimizing medical commerce. Our ecommerce medical website aims to make healthcare more affordable and accessible. The platform offers discounts and substitutes for expensive branded products. This saves patients time and money while providing privacy and flexibility. In essence, our website is at the intersection of healthcare and eCommerce. We utilize technology to provide users more transparency, convenience, and agency over their health. By implementing the latest machine learning techniques in recommendations systems, we aim to make the website more tailored towards the customer’s requirements. While the traditional model requires hospitals to visit multiple providers for equipment and services, we offer everything on a single platform in a streamlined manner.

LIST OF FIGURES

Figure	Name	Page No.
Fig. 1.1	abc	(3)
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LIST OF TABLES

Table No.	Table Description	Page. No
1	Admin	
2	Cart	
3	Category	
4	Customer	
5	Order_product	
6	Orders	
7	Products	
8	Supplier	

LIST OF ABBREVIATIONS

1	AI	Artificial Intelligence
2	ML	Machine Learning
3	CF	Collaborative Filtering
4	NCF	Neural Collaborative Filtering
5	UI	Machine Learning
6	WHO	World Health Organisation

CHAPTER 1

INTRODUCTION

E-Health is fundamentally transforming the landscape of healthcare. It refers to the utilization of information and communication technologies to deliver health services, manage patient information, provide telemedicine, enable wearable health monitoring devices, and much more. E-Health improves access, efficiency, quality, and safety across the healthcare ecosystem.

A key subset of eHealth is medical commerce the buying and selling of pharmaceuticals, insurance, and other health products online or via mobile devices. Medical Commerce provides more convenient access to medications, supplements, devices and eliminates geographic restrictions through e-pharmacies.

1.1 Purpose

Medical e-Commerce refers to the selling, purchasing and distribution of medical equipment also known as “therapeutic gadgets” as per the World Health Organization (WHO) by incorporating the procedures of e-commerce. The COVID-19 pandemic brought forth many challenges to the medical sector. The dearth of medical equipment, disruption of supply chains and lack of coordination among the various stakeholders illustrate the many shortcomings in the traditional model. One of the primary reasons for the failure of the traditional model was lack of accessibility and the dependence on intermediate agents. This problem is significantly reduced if one is able to access an online platform which conforms to industry standards. Therefore, it becomes incumbent upon us as Software Professional’s to work towards optimizing medical commerce.

To overcome the problems mentioned above, we aim to study the various algorithms of e-commerce recommendation systems with special emphasis on neural collaborative filters. We also hope to understand the gaps and pitfalls of the current procedures in medical commerce and determine how e commerce can help in reducing those gaps. We also seek to provide on-demand services for healthcare providers (hospitals) to search for products based on their needs and make detailed requests accordingly and finally to apply our finding and research

towards building a dynamic platform (known as EquipMed) for medical equipment retailers to promote their products.

We hope that our work here today can play a small but significant role in making medical commerce faster, more accessible to rural health centers and cheaper by virtue of providing a diverse array of options for hospitals to choose from ,using enhanced recommendation systems while also allowing suppliers to expand their geographical scope

1.2 Scope

Our project will focus on the issues surrounding, distribution, buying and selling of medical equipment which is a vast field in and off itself, e-Health is a vast field with many domains and sub-domains. It is even possible to take a particular piece of equipment and build an entire application around that single product. E-health even extends to wearable embedded systems or e-health records. There is a lot of scope for innovation in all these fields but we feel that medical commerce is the most pressing of all these fields.

The features of our project are:

- A dynamic user friendly web interface
- A user recommendation system based on collaborative filtering

CONCLUSION

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*Regular Text [Times Roman, 12, left & right justified]

REFERENCES

- 1.
- 2.

INSTRUCTIONS ON PROJECT DISSERTATION WRITING / SUBMISSION

The previous pages specify the Sem 7 Project Report format.

The following pages are the guidelines for writing Sem 7 Project Report. Do not include them in your document.

- **Everything mentioned in RED in the above format must be replaced as per your project and font color should be changed to BLACK.**
- **All font styles mentioned should be strictly followed.**
- **Minimum number of pages: 20**
- **Number of project books per group: 02**
- **The booklet must be spiral bound.**

- **A soft copy of the prepared report should be submitted to the project guide well in advance for checking. Hard copy should be printed only after guides approval.**

Detailed Guidelines

1. The document name should be in the following format
BEProjectReportCP#For2024
Where CP# is the project group code number.
2. Header and Footer must be updated.
3. **All text placed in box bracket [] or RED should be replaced by the respective data.**
4. Only Chapter headings and sections headings are to find a place in the Table of Contents. No sub-section headings must be included in the table of contents.
5. Acknowledgements: The following order shall be maintained.
 - i. The Principal
 - ii. The HOD
 - iii. The Faculty Guide.
 - iv. The Organization Guide / Staff (if applicable)
 - v. Others if any

Designations of the staff must be mentioned.

6. All Chapters shall begin on a fresh page. No gaps are to be left after Sections / Sub Sections. Additional chapter other than those mentioned in the contents may be included if required after consultation with the guide.

7. All figures and tables must be numbered in the text, and must find a place as close as possible to the point of reference. (Same page/ succeeding page). E.g., Fig. 4.6 represents figure number 6 in the 4th Chapter, Fig. 5.1 represents figure number 1 in the 5th Chapter.
 - i. Figure title must be centered at the bottom of the figure and appear as per the format
 - ii. Table title must be centered and it must appear on the top of the table as per the format.
 - iii. The format for numbering the equation is also indicated.
8. Every Chapter must begin with some text (in the form of an introduction / out line) before the first section of the Chapter concerned opens. Additional chapter other than those mentioned in the contents may be included if required after consultation with the guide.
9. References: Standard format prescribed below are to be observed.
10. Table of contents must match exactly with the Headings in the body of the text. This must carefully be checked.
11. Ensure that the report has the project title that was approved at the beginning of sem 7.
12. **A copy of the prepared manuscript before final printing and SPIRAL binding must be submitted to the guide for his / her approval.**
13. All source code listings, hard copies of reports etc are to be brought for the Viva- voce Examination.

Introduction

Purpose

Project Scope

Literature Survey

< Describe the various analysis and research made in the field of your interest and the results already published, taking into account the various parameters of the project and the extent of the project. Add the reference number in the square brackets or parenthesis. This will refer to the citation in the references list. For example

“... the theory has proved the point effectively [2].”

“Williams [4] has presented the theory forward in 2008.”>

Overall Description

Project Perspective

<Describe the context and origin of the project being specified. For example, state whether this project is a follow-on member of a project family, a replacement for certain existing systems, or a new, self-contained project. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

Project Functions

- To study the various algorithms of e-commerce recommendation systems with special emphasis on neural collaborative filters.
- To provide on-demand services for healthcare providers(hospitals) to search for products based on their needs and make detailed requests accordingly.
- To study the gaps and pitfalls of the current procedures in medical commerce and determine how ecommerce can help in reducing those gaps
- To apply our finding and research towards building a dynamic platform (tentatively known as EquipMed) for medical equipment retailers to promote their products.

User Classes and Characteristics

<Identify the various user classes that you anticipate will use this project. User classes may be differentiated based on frequency of use, subset of project functions used, technical expertise, security or privilege levels, educational level, or experience.>

Operating Environment

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>

Requirements

Functional Requirements<Defines the function of the system under different conditions.>

Other Nonfunctional Requirements<Describes how the system should perform. This includes reliability, security, performance, maintainability etc.>

Hardware Requirements<Hardware required to develop the project.>

Software Requirements< Software required to develop the project >

System Design

<This section illustrates organizing the functional requirements for the project by system features, the major services provided by the project. You may include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams as the System Design Diagram 1, System Design Diagram 2 and so on in the below subsections>

System Design Diagram 1

System Design Diagram 2...

Implementation and Testing

<This section illustrates implementation and testing. You may include important code snippets and screenshots in this section and name the sub-titles accordingly.>

References

<This section provides the full citations for all the references you have used. The references should be numbered serially in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g [3]. The section on references should list them in serial order in the following format.

a) For Textbooks

[Ref number] Name of the author(s), Title of the book, Publisher, Edition, Year of publication

[1] A.V. Oppenheim and R.W. Schafer, Digital signal processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975

b) For Papers

[Ref number] Name of the author(s), Title of the paper, Publisher, Volume no. , Year of publication, Page nos. from – to

[2] Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981 , pp 1901-1907

c) For Website-

[Ref number] Author's initials. Authors Surname. (Year, Month. Day). Title of web page [Online]. Available: URL

[3] M. Holland. (2002). Guide to citing internet sources [Online]. Available: http://www.bournemouth.ac.uk/library/using/guide_to_citing_internet_sourc.html

d) For Reports-

[Ref number] Author's initials. Author's Surname, "Title of report," Abbreviated Name of Company., City of Company., State, Report number, year.

[4] P. Diamant and W. L. Luptakin, "V-line surface-wave radiation and scanning," Dept. Elect. Eng., Colombia Univ., New York, Sci Rep. 85, 1991.

e) For E-Books-

[Ref number] Author's initials. Author's Surname. (Year, Month Day). Book Title (edition) [Type of medium]. Available: URL

[5] W. Zeng, H. Yu, C. Lin. (2013, Dec 19). Multimedia Security Technologies for Digital Rights Management [Online]. Available: <http://goo.gl/xQ6doi> >