UE19CS309A

Capstone Review II

PROJECT TITLE : MEDICAL TOURISM RECOMMENDER SYSTEM

PROJECT ID : TEAM 6

PROJECT GUIDE: PROF. BHARATHI R

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TABLE OF CONTENTS

01.

PROBLEM STATEMENT

PROBLEM STATEMENT:

What?
According to a survey, healthcare expenses have risen dramatically in most regions of the world, and in certain areas, people are unable to access high-quality treatment due to a lack of infrastructure.

When?
As a result, people seek out locations where they can avail high-quality treatment at a reasonable cost.

Whom does it affect?
High healthcare costs disproportionately affect lower-middle-class families, uninsured adults and those with lower incomes.

Our project seeks to address the above three W's by providing access to good quality healthcare at lower costs through " Medical tourism in India ".

02.

INTRODUCTION

INTRODUCTION TO MEDICAL TOURISM :

- Medical tourism refers to people traveling abroad to obtain medical treatment.
- In the past, this usually referred to those who traveled from less-developed countries to major medical centers in highly developed countries for treatment unavailable at their hometown.
- In recent years it may equally refer to those from developed countries who travel to developing countries for lower-priced high-quality medical treatments.
- The motivation may be also for medical services unavailable or non-licensed in the home country.
- Medical tourism most often is for surgeries (cosmetic or otherwise) or similar treatments, though people also travel for dental tourism or fertility tourism.
- People with rare conditions may travel to countries where the treatment is better understood. However, almost all types of healthcare treatments are available, including psychiatry, alternative medicine, convalescent care, and even burial services.
- Health tourism is a wider term for travel that focuses on medical treatments and the use of healthcare services. It covers a wide field of health-oriented tourism ranging from preventive and health-conductive treatment to rehabilitation and curative forms of travel.

MAJOR REASONS FOR THE RISE IN THE MEDICAL TOURISM [WORLDWIDE] :

- Rising cost of health care.
- High quality treatment is provided at affordable prices in many parts of globe.
- The ease and affordability of international travel.
- Improvements in both technology and standards of care in many countries.
- Long wait times for certain procedures.
- People residing in countries that lack proper medical infrastructure can avail high quality treatment.

REASONS FOR THE RISE OF MEDICAL TOURISM IN INDIA :

- **Cost** : Most estimates found that treatment costs in India start at around one-tenth of the price of comparable treatment in the United States or the United Kingdom.The most popular treatments sought in India by medical tourists are alternative medicine, bone-marrow transplant, cardiac bypass, eye surgery, and hip replacement.
- **Quality of Care** : India has 39 JCI accredited hospitals.The city of Chennai has been termed "India's health capital".Multi- and super-specialty hospitals across the city bring in an estimated 150 international patients every day.
- **Ease of travel** : The government has removed visa restrictions on tourist visas that required a two-month gap between consecutive visits for people from Gulf countries which is likely to boost medical tourism. A visa-on-arrival scheme for tourists from select countries has been instituted which allows foreign nationals to stay in India for 30 days for medical reasons.In 2016, citizens of Bangladesh, Afghanistan, Maldives, Republic of Korea and Nigeria availed the most medical visas.
- **Language** : Despite India's diversity of languages, English is an official language and is widely spoken by most people and almost universally by medical professionals. In Noida, a number of hospitals have hired language translators to make patients from Balkan and African countries feel more comfortable while at the same time helping in the facilitation of their treatment.

03.

SUGGESTIONS FROM REVIEW I

SUGGESTIONS FROM REVIEW I :

- Focus on scraping data from official websites.
- Dataset must be validated
- Getting the actual range of prices for the treatments.
- Find out all the possible recommendation systems
- Look for enhancements that are possible in the existing models.
- Look for ways to improve accuracy of the models.
- Find out ways to collaborate with hospitals and if possible get the data from them.

FEASIBILITY STUDY :

1. **Technical Feasibility :**
   We will make use of web technologies like HTML/CSS/Javascript/MERN stack to create the website
   Frontend : We intend to use technologies like HTML , CSS , JS , React etc.
   Backend : We intend to use technologies like NodeJS, PHP , etc.
   Database : We intend to use technologies like MongoDB , mySQL etc.
   We would fetch the data via web scraping tools like BeautifulSoup and other technologies.
   Challenges : The possible challenges we might face is fetching data from hospitals all over India.
   Market Analysis : There are few existing websites like https://medsurgeindia.com, https://medigence.com
   The disadvantages in these websites include :
   - Personalized recommendations aren't present.
   - The UI isn't appealing.
   - They are localized only to allopathy.
   - Some of these websites don't have medical insurance assistance.
   - These websites aren't personalized to the budget friendliness of the user.
2. **Economic Feasibility** : Overall the project is feasible in terms of economic aspect .
3. **Social Feasibility** : This idea has a huge social impact as it will drive the patients to a high quality and affordable treatment and would improve their health. A person would not trust a piece of software as it is the matter of life and death. To gain this trust we plan to put the relevant facts in the website.

TARGET GROUPS AND CHARACTERISTICS:

- The target population includes all the individuals that seek medical treatment in abroad.
- Majorly users will include people of countries where specific infrastructure is not available,lower-middle-class families, uninsured adults and those with lower incomes.
- This system would be incorporated with a privacy mechanism is advantageous to both the hospitals and the patients with special needs in terms of privacy violation protection, scandals, and longevity of the patients

CONSTRAINTS / ASSUMPTIONS / DEPENDENCIES AND RISKS :

CONSTRAINTS :

- Obtaining data from hospitals is difficult as they need to protect the privacy of their patients.
- We cannot validate the data that is scraped so we assume it is accurate since it is scraped from official websites.
- If the data is inaccurate it can cause issues to the tourists who seek treatment in India by possibly crossing the budget.

RISKS :

- Any slight flaws in providing a suggestion can mean the difference between life and death for a person.
- The end user must have faith in a piece of software to make treatment decisions for him or her.
- The medical treatments offered by a facility may not be at par with the developed nations even if it declared so.

ASSUMPTIONS :

- We assume that the data scraped from the websites of the hospitals is accurate and valid.

04.

ABSTRACT AND SCOPE OF THE PROJECT

ABSTRACT AND SCOPE OF THE PROJECT :

Purpose, Objective and Goal :

- We intend to create a **website** that provides access to the best health care plan at affordable prices using **ML technologies** like **recommendation systems**.
- In addition to helping people get access to **healthcare at lower costs,** it also helps those in under developed countries get the opportunity to undergo high quality treatment.

Benefits :

- **Compared** to other medical tourism **destinations**, **India will inevitably take a lead**, due to the cost effectiveness of treatment available in this country
- **For example**, a patient from UK who plans to travel to a medical tourism destination has more chances of saving better if he/she decides to visit India than Thailand due to better quality treatment.
- In addition to being cost effective, the government of India provides some form of **medical insurance** which helps the patients to cure their ailments at affordable price.
- Patient is personally recommended with the best hospital for his/her medical and economic conditions using certain advanced recommendation system.
- Patient is also suggested with traditional treatment types such as Ayurveda,Naturopathy, Siddha etc.
- Thus the patient would be assisted from beginning to the end of his/her medical voyage.

ABSTRACT AND SCOPE OF THE PROJECT:

Limitations :

- Main disadvantage of medical tourism is that the patient and their family members are not sure about the qualifications of the doctors.
- The medical treatments offered by a facility may not be at par with the developed nations even if it declared so.

05.

LITERATURE SURVEY

LITERATURE SURVEY :

The following link has the summary of the papers read by us
We read papers in the following domain : Medical Tourism, Recommender Systems, Hospital Recommender Systems, Patient-Doctor Relationship, Trust Factor based recommender systems, Privacy backed recommender system, Sentiment Analysis in medical tourism.

Link : https://pesuonline.sharepoint.com/:x:/s/CapstoneProject2022-Team6/EZyCRzzLlr1IkC8p_kAu_DYB1HhbALIpFcBnXkgeNq_y7w?e=C9Jq7I

KEY POINTS FROM THE LITERATURE SURVEY :

- Most of the papers that we came across were based on collaborative filtering or hybrid recommender systems.
- We came across multiple improvements to the existing recommender system like adding trust factor between the patient and the doctor , adding sentiment analysis to recommend based on the sentiments of the online reviews , surveys from doctors , K-Means for clustering the similar patients.
- The papers also gave us an idea about how we can implement our project and what would be the ideal system architecture.
- One of the papers also hinted on making use of blockchain to secure the data of the patient and protect their privacy.
- Many of the methodologies were able to deal with problems like sparse inputs , cold start problem , Synonymy , Grey sheep where users aren’t part of any group.
- To evaluate the results the papers made us : Recall , Precision , F1 Score , Accuracy , Hit ratio.

06.

FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

FUNCTIONAL REQUIREMENTS :

- The web application must receive input from the user regarding his/her preferences like their budget , location , distance from airport.
- The web application must display the appropriate treatments via dropdowns and suggestions.
- The web application must display the appropriate details of the treatment to the user based on the recommendation and the filtering.
- The web application must also display details of the medical insurance provided by the hospital if any.
- The web application must also display all the details of the doctor and the hospital for the recommended treatment.

NON FUNCTIONAL REQUIREMENTS :

- To recommend the treatments to the user , once the user enters basic treatment related words like kidney stones , the possible list of treatments must be generated by the web application from which the patient can select.
- The web application shall recommend the appropriate hospital and doctor to the patient based on their preferences by using various recommendation algorithms.
- The web application shall also display the results in low response time.
- The web application shall also have an internal connection with the medical insurance companies to connect the patient to the appropriate insurance need.

07.

EXPECTED DELIVERABLES

CAPSTONE PHASE I DELIVERABLES :

- Defining a clear problem statement.
- Defining the project objectives.
- Determining the scope and major tasks.
- Designing the project Plan (Gantt chart).
- Literature Survey.
- Project Requirement Specifications.
- High–Level Design Document (HLD).

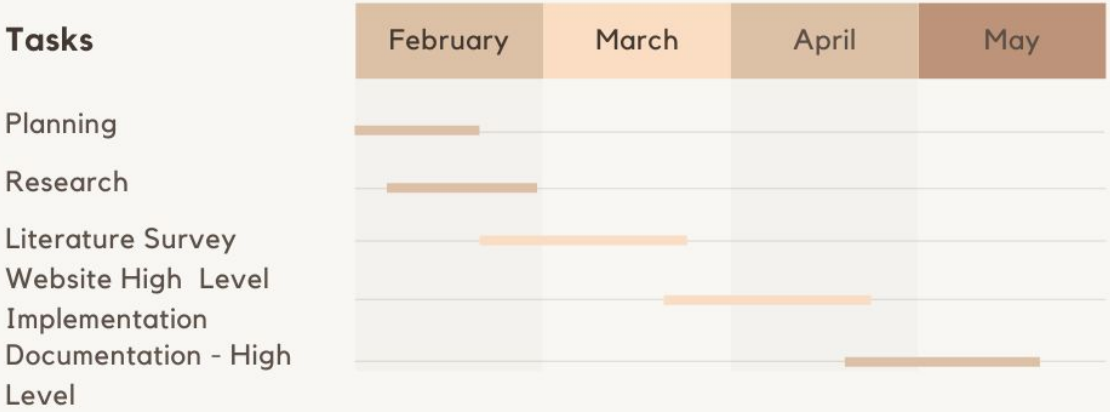
CAPSTONE PHASE II DELIVERABLES:

- Low–Level Design Document (LLD).
- Design philosophy and its suitability for the project –
  - UI design
  - Back–end design
- Inputs on the technology/platforms/middle–wares to be used in project execution.
- Implementation of the project hardware and software modules.
- Test plan and test cases.
- Demonstrate the final working Software/Hardware model.
- Hard and soft copy of the report.

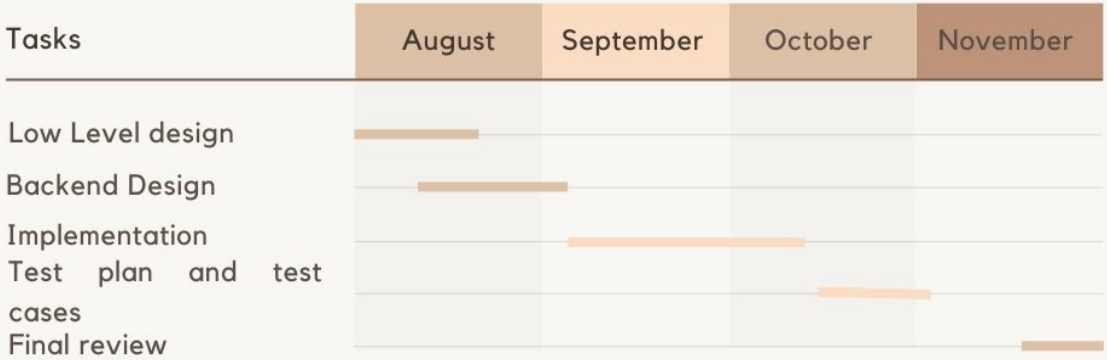
08.

CAPSTONE PHASE I AND PHASE II TIMELINE

Gantt Chart
CAPSTONE PHASE - I



Gantt Chart
CAPSTONE PHASE - II



09.

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THANK YOU