Human Computer Interaction Project Abstract

Applying Usability and HCI Principles in Developing Medical Website

GROUP MEMBERS:

First Name	Last Name	Registration Number	Roll Number
Aman	Chopra	140911358	44
Csaradhi	Tejas	140911310	37
Tanveer	Sapra	140911266	32
Vibhavari		140911013	04

Synopsis:

In this project we have built a website which caters to patients' need to store their medical data securely. This website acts as a user personalized medical database.

Human Computer Interaction Project Abstract

Cardigram, a real time data analytics and prediction module is an inbound attempt to create an online host for presenting data using visualizing tools like animated charts and tables. It also predicts the gensini score which is an index of severity of coronary artery disease in patients.

Cardigram is subjected to high scale data presentation values which would convert the test reports of patients into presentable tables and easy to analyse charts.

The site is primarily written in **HTML**, **CSS** and **Node.js**. The back end uses **MongoDB** and hence uses concepts of Database Design and Maintenance.

Statistics and **Machine Learning** are used for Data presentation and CAD prediction. This is done in the R Programming Language.

Domain: Medical and Health care.

Functionalities:

1. Stores patient's medical data.
2. Generate animated charts from the uploaded data.
3. Can save patient's report in any format which can be downloaded later.
4. Generate tables from patient's data which can be indexed and sorted.
5. Predicts Gensini score using R which tells the severity of coronary artery disease.

HCI Principles included:

Application of Human Computer Interaction principles is important to make the site as user friendly as possible and successful. We have tried to improve the safety, utility, effectiveness, efficiency and usability of our website using the following principles:

1. **Purpose**: The purpose of website is clearly defined in the front page using banners and gif images.

2. **Audience**: This website is designed for all kind of audience. Anyone can use it to store their data.

3. **Page Linking**: Different pages of the site are linked together in an efficient way. Hierarchical organization is used to link pages.

4. **Navigation tools**: Tools like links on the side bar and hamburger menu are provided to navigate the web site easily.

5. **Length of pages**: Short pages of not more than two screens in length are used. Only the opening page is long to give all the details of website and hence internal links and automatic scrolling is provided so that user experience is smooth. The size of opening

page is small so that it can be loaded quickly.

6. **Visual design**: Visual elements throughout the site are consistent. Font colours and background colours have a good contrast and the text is easy to read.

7. **Text design**: Short sentences and bulleted-list are used. Sans serif font Arial is used and all the spellings and grammar is correct.

8. **Graphics design**: Images, parallax, themes and animated items are used to make the web site attractive. The graphics size is kept as small as possible so that it does not increase the uploading time.

Modules in the project:

Frameworks/Database/libraries/ML Algorithms used:

Bootstrap: An open source toolkit for developing with HTML, CSS, and JS. It quickly prototype the ideas with its Sass variables and mixins, responsive grid system, extensive prebuilt components, and powerful plugins built on jQuery. It makes our website responsive and compatible with all the devices ranging from smartphones to computers.

R packages used are:

- **MASS (Ridge regression)**
- **lars (Lasso regression)**
- **neuralnet (Neural networks)**

MongoDB: Stores data in flexible, JSON-like documents. It helps in Ad hoc queries, indexing, and real time aggregation which in turn provide powerful ways to access and analyze the data.

Expected Results:

Highly interactive, comprehensive, responsive and easy interface for users to securely store their personalized medical date and generate charts, tables to easily analyze their health status. The web site is responsive and follows security paradigms like hashing to store user data securely.