

PROJECT DESIGN PHASE-II  
SOLUTION REQUIREMENTS  
(FUNCTION & NON-FUNCTIONAL REQUIREMENTS)

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| DATE         | 10 OCTOBER 2022  |
| TEAM ID      | PNT2022MID37943  |
| PROJECT NAME | Visualizing and Predicting Heart Diseases with an Interactive Dash Board |
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FUNCTION REQUIREMENTS:

FOLLOWING ARE THE REQUIREMENTS OF THE PROPOSED SOLUTION.

| FR.NO | FUNCTIONAL REQUIREMENT | SUB REQUIREMENT (STORY /SUB-TASK)  |
|-------|------------------------|--|
| FR-1  | User Registration      | Cardiovascular diseases are the most common cause of death worldwide over the last few decades in the developed as well as underdeveloped and developing countries.  |
| FR-2  | User Confirmation      | The purpose of this paper is to describe the development and data validation of a HF dashboard that monitors the overall metrics of outcomes and treatments of the veteran patient population with HF while providing guidance to clinicians on mainstay of pharmacologic therapies. |
| FR-3  | App installation       | Users can connect their 23andMe information to the MyGeneRank app using an iPhone or Android smartphone. After syncing the data, the app calculates the user's risk score for a heart attack based on the latest genetic risk factors for coronary artery disease (CAD).             |

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| FR4  | Location settings  | Coronary artery disease is a common heart condition that affects <b>the major blood vessels that supply the heart muscle.</b>  |
| FR-5 | Detecting location | The app was <b>95% accurate</b> as an ECG for the detection of AF. The study was presented at the American Heart Association's Scientific Sessions.  |
| FR-6 | User Interface     | The proposed work <b>predicts the chances of Heart Disease and classifies patient's risk level</b> by implementing different data mining techniques such as Naive Bayes, Decision Tree, Logistic Regression and Random Forest.   |
| FR-7 | Database           | The Cleveland Heart Disease Data found in the UCI machine learning repository <b>consists of 14 variables measured on 303 individuals who have heart disease.</b>  |
| FR-8 | Server             | The heart and vascular system are highly vulnerable to a variety of environmental agents, including tobacco smoke, solvents, pesticides, and other inhaled or ingested pollutants, as well as extremes in noise and temperature. |

## NON-FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution

| FR NO: | NON-FUNCTIONAL REQUIREMENTS | DESCRIPTION  |
|--------|-----------------------------|--|
| NFR-1  | Usability                   | A total of 43 medical records were reviewed and 66 HF dashboard data discrepancies were identified during development. Discrepancies identified included: generation of multiple EF values on a few patients, missing or incorrect ICD codes, laboratory omission, incorrect medication issue dates, patients incorrectly noted as nonconcordant for medications, and incorrect dates of last cardiology appointments. |
| NFR-2  | Security                    | Continuous refinement with input from multiple level of stakeholders is crucial to development of clinically useful dashboards. Extraction of all relevant information from EMRs, including the use of natural language processing, is crucial to development of dashboards that will help improve care of individual patients and populations.  |
| NFR-3  | Reliability                 | Easy to carry.<br>User friendly.<br>Flexible.  |

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| NFR-4 | Availability | <p>Access to health care may be restricted not only because of financial reasons, but also because of geographic barriers, waiting times and other reasons. In Europe, around 3% of the population on average in countries that are OECD members reported unmet needs for medical examination due to cost, travel distance or waiting lists in 2013, according to the EU-SILC survey. The share of population reporting such unmet medical care needs was highest in Greece and Poland, and lowest in the Netherlands and Austria.</p> |
| NFR-5 | Performance  | <p>Many organisations have separate and disperse set of data for many years. Disperse and separation data have negative impacts for the organizations. Thus, the concept of data warehousing has emerged. From data warehouse concept many different systems and disintegrated data can be modelled and become integrated data.</p>  |
| NFR-6 | Scalability  | <p>platform applies several principles and technologies to ensure a secure big data environment. The first important privacy tenet is that no Protected Health Information (PHI) data are used (stored or transferred) the platform. The second important factor is that all data in transit and at rest are end-to-end encrypted and de-identified using the best practices in cipher suites; hence, even if an attacker accesses any data, it would be encrypted and de-identified.</p>  |

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| NFR-7 | Evaluability | <p>This study managed to provide a significant contribution in computing the strength scores with significant predictors in heart disease prediction. From the evaluation results we obtained important rules and achieved highest confidence score by utilizing the computed strength scores of significant predictors on Weighted Associative Rule Mining in predicting heart disease.</p>  |
| NFR-8 | Dynamicity   | <p>The Local Trends in Heart Disease and Stroke Mortality Dashboard is an intuitive, self-guided, online dashboard that provides high-quality data on trends in local CVD mortality to public health practitioners, clinicians, and community leaders for use in informing policy and program decisions. When first visiting the dashboard, users are shown a curated landing page that briefly describes the dashboard and allows for navigation to views at the national, state, and county levels.</p> |
| NFR-9 | Desirability | <p>It is also known as attributes selection. It is the procedure of detecting and eliminating as many irrelevant and redundant features. It concentrates on decreasing the number of irrelevant features. This process permits learning procedures to work quicker and more efficiently. Also, it decreases the dimension of the data</p>   |