Project Design Phase-I
Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID23446
Project Name	**Visualizing and Predicting Heart Diseases with an Interactive Dash Board**
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Predicting and diagnosing heart disease is the biggest challenge in the medical industry and it is based on factors like physical examination, symptoms and signs of the patient .Heart disease is perceived as the deadliest disease in the human life across the world. In particular, in this type of disease the heart is not capable in pushing the required quantity of blood to the remaining organs of the human body in order to accomplish the regular functionalities. Some of the symptoms of heart disease include physical body weakness, improper breathing, swollen feet, etc. The techniques are essential to identify the complicated heart diseases which results in high risk in turn affect the human life. Presently, diagnosis and treatment process are highly challenging due to inadequacy of physicians and diagnostic apparatus that affect the treatment of heart patients.
2.	Idea / Solution description	K-means clustering is an unsupervised class of machine learning algorithm. Usually, unsupervised algorithms project the desired output without referring any value. In K-means clustering algorithm, the data are clustered in such a way that it has highest intra-class similarity and minimal inter-class similarity. This algorithm lessens the sum of squares distance from the centroid within the cluster. The algorithm divides the data into k clusters with a centroid. K-means iteratively finds the centre that reduces the distance among individual points in a cluster and the cluster centre.

		Tableau is one of the business intelligence software used to analyse data and visualize the insights in the form of graph and charts. User can develop and share an interactive dashboard which shows the hidden pattern, trends, density and variation of data. Tableau uses centroid-based k-means clustering algorithm that divides the data into K-number of clusters. Dashboards are created with the data set after applying K-means algorithm. It provides visual appealing clusters in order to predict the occurrence of heart disease from the given dataset.
3.	Novelty / Uniqueness	Heart stroke and vascular disease are the major cause of disability and premature death. Chest pain is the key to recognize the heart disease. In this work, the heart diseases are predicted by considering major factors with four types of chest pain. K-means clustering is one of the simplest and popular unsupervised machine learning algorithms. Here the datasets are clustered and based upon the clusters the happening of chest pain is predicted. The role of exploratory data using tableau provided a visual appealing and accurate clustering experience.
4.	Social Impact / Customer Satisfaction	. In this work, the heart diseases are predicted by considering major factors with four types of chest pain. K-means clustering is one of the simplest and popular unsupervised machine learning algorithms.
5.	Business Model (Revenue Model)	Invasive diagnostic method includes incise procedures in which instruments are used to cut the skin, mucus membrane and connective tissues. In contrast, non-invasive methods are used to diagnose diseases without opening the skin. Some of the machine learning algorithms based on non-invasive methods are Support Vector Machine (SVM), K- means clustering, K-Nearest Neighbour (KNN), Artificial Neural Network (ANN), Naive Bayes, Logistic Regression and rough set. Dashboard will also help in collecting customer feedback.
6.	Scalability of the Solution	This model can be easily adopted among lot of patients having heart diseases and it can be easily deployed. It can be used and accessed by everyone and it can handle the requests from the patients.