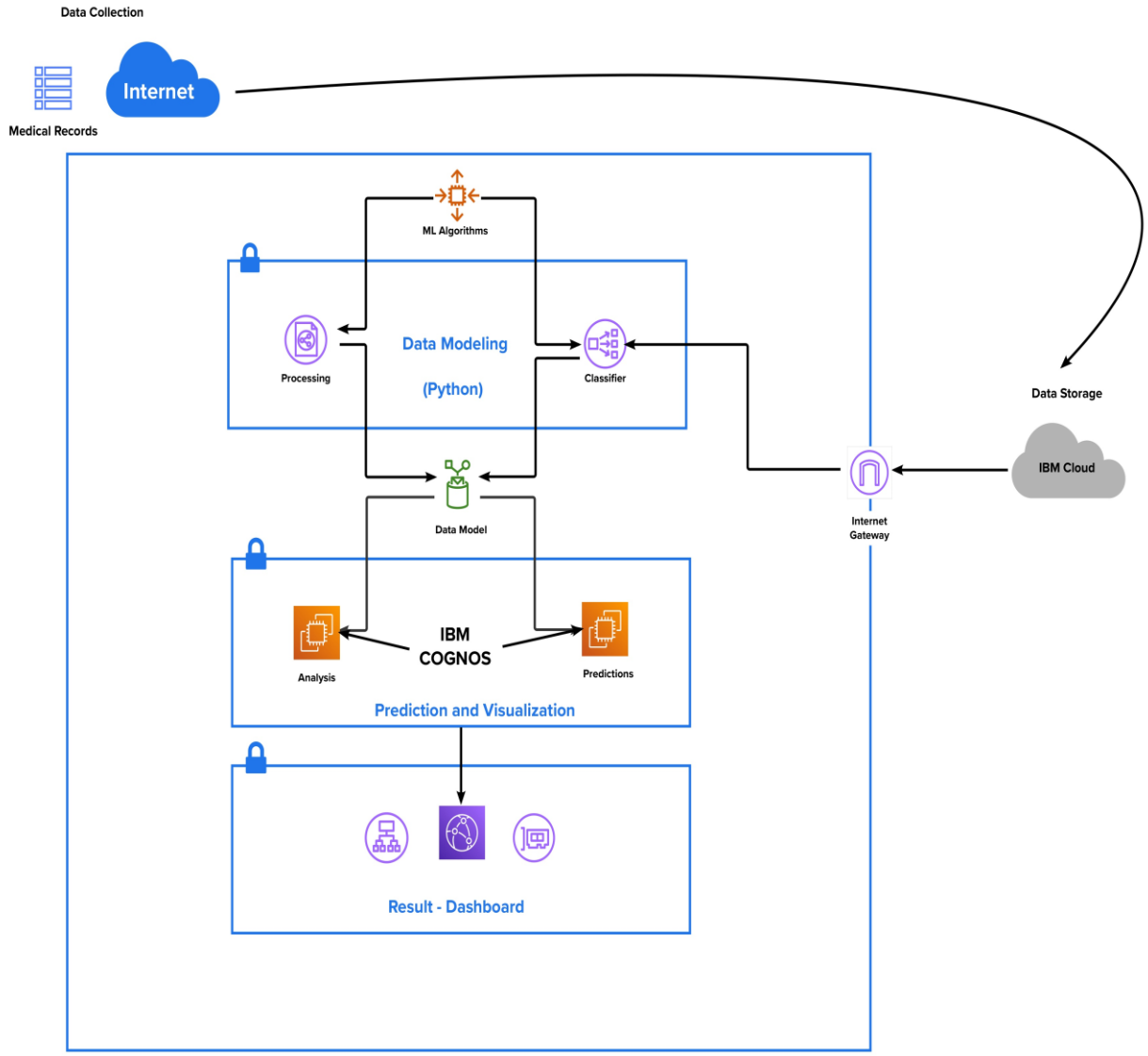
Solution Requirements

(Solution Architecture, Functional and Non – Functional Requirements)

Date	15 October 2022
Team ID	PNT2022TMID23310
Project Name	Visualizing and Predicting Heart Diseases with an Interactive Dashboard
Maximum Marks	4 Marks

Solution Architecture:



FUNCTIONAL REQUIREMENTS:

- The below mentioned are considered to be the functional requirements for the proposed solution.

FR No.	Functional Requirement (EPIC)	Subject Requirement (Story/ Sub-Task)
FR – 1	Dataset Collection	To acquire the best results, data is gathered from a variety of sources, especially those that specifically cater to real-world data. In this instance, we make use of a data set of individuals who have had examinations and testing to identify heart disease. The data set is a matrix where the rows represent the patients and the columns represent the factors or traits (features) that will be put to the test.
FR – 2	Manual Exploration	This process is crucial for the development of machine learning algorithms. Since we study the data set, we should rank or categorize each individual as either sick or not. We create the data set, which serves as the training dataset for the algorithms.
FR – 3	Data Pre-processing	Data pre-processing is a crucial phase in the machine learning process since the caliber of the data and the information that can be extracted from it directly affects how well our model can learn. For this reason, it is crucial that we preprocess the data before introducing it to our model.
FR – 4	Data Modeling	This stage involves applying and evaluating the chosen algorithms in order to determine which is the most effective.
FR – 5	Data Analysis and Prediction	The insights obtained from the model construction predicts the necessary output in accordance with user needs.
FR – 6	Visualization	We apply different techniques to achieve the final results, which are visualized using various representations

NON - FUNCTIONAL REQUIREMENTS:

- The below mentioned are considered to be the non - functional requirements for the proposed solution.

NFR No.	Non - Functional Requirement	Description
NFR – 1	Quality of Dataset	Dataset should be gathered in such a way it is well suited to serve its specific purpose without any anomalies as the final result is dependent on the dataset selected.
NFR – 2	Runtime, Adaptation, Evolution	To take into account a needs-based approach to runtime system operation, where functional and quality requirements might be tracked in real-time using information from the system that is actually running. Work in this field proceeded further to take requirements-based runtime adaptation into account. For instance, if a particular quality need is not properly met at runtime, the system will evolve and alter to try to improve performance or quality while taking quality trade-offs into account.
NFR – 3	Accuracy & Performance	The majority of machine learning (ML) work discusses algorithm accuracy (typically precision and recall), or how "accurate" the output is in relation to reality. More research on algorithm performance is being done, including comparisons of performance in various circumstances.
NFR – 4	Fairness	Concentrate on technological ways to improve the fairness of ML algorithms, concluding that removing sensitive features is insufficient to guarantee fair results, and taking into account the trade-off between fairness and other NFRs. The accurate implementation of fairness depends more on how it is defined and measured than how it is implemented, according to research in this area that has sought to find mathematical or formal definitions of fairness, such as statistical parity or individual fairness. Engineers seek to take into account fairness' negative impacts and view it in the context of a larger system.

NFR – 5	Transparency	Although the outcomes of ML can have a substantial impact on the actual world, it is frequently unclear how these outcomes are obtained, which undermines confidence and openness. To address this problem, it is important to better the ML results explanations.
NFR – 6	Security and Privacy	Introduce a technique to protect privacy in ML with an emphasis on minimising runtime and communication overhead. A threat model for ML that takes into account the rise in ML-related security and privacy issues to be recognized.
NFR – 7	Testability	Testing the outcome of ML systems to improve software testing strategies.
NFR – 8	Reliability	Looking at the reliability of individual ML predictions, focusing on reliability estimation