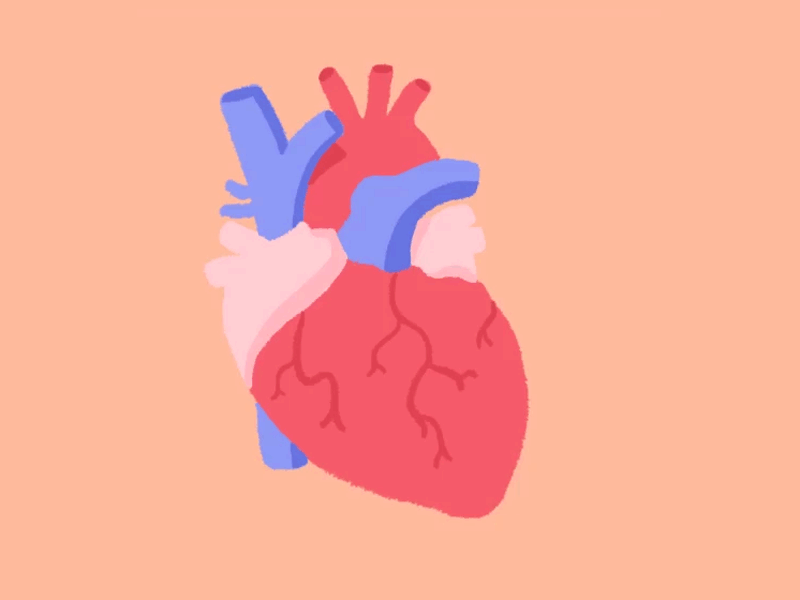
**High Level Design (HLD) Document**

**Heart Disease Diagnostic Analysis**

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**Bhushan Patil**

**Document Version Control**

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**Abstraction**

Heart disease is a term which covers any disorder of the heart. Heart Studies show that the number of deaths due to heart disease have increased significantly over the past decade in India or in the world so becoming a major health concern to deal with. Heart disease is becoming the cause of death in India. Studies show that from 1990 to 2016 the death rate due to heart disease increased around 34% from 155.7 to 209.1 deaths per 1 lakh population in india.

Thus, preventing heart disease has become necessary to every human being. Good data-driven system for predicting heart disease can improve the entire research and prevention process, making sure that more people can live healthy lives.

**1 Introduction**

**1.1 Why this High-Level Design Document?**

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions before coding and can be used as a reference manual for how the modules interact at a high level.

**The HLD will:**

• Present all of the design aspects and define them in detail.

• Describe the user interface being implemented.

• Describe the hardware and software interfaces.

• Describe the performance requirements.

• Include design features and the architecture of the project.

• List and describe the non-functional attributes like:

- Security

- Reliability

- Maintainability

- Portability

- Reusability

- Application compatibility

- Resource utilization

- Serviceability

**1.2 Scope**

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

**2 General Description**

**2.1 Product Perspective & Problem Statement**

Health is real wealth in the pandemic time we all realized the brute effects of covid-19 on all irrespective of any status. You are required to analyze this health and medical data for better future preparation. We have 303 individual heart rate disease datasets by which we need to extract various information such as Heart disease rates, Heart disease by gender, age.

We need to create a dashboard with the best data extracted from datasets. We need to find key metrics and factors and show the meaningful relationships between attributes.

**2.2 Tools used**

Business Intelligence tools and libraries such as NumPy, Pandas, Seaborn, Matplotlib, MS-Excel, MS-Power BI, Jupyter Notebook and Python Programming Language are used to build the whole framework.



**3. Design Details**

**3.1 Functional Architecture**

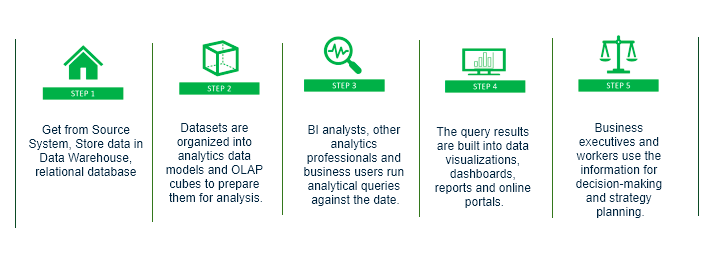
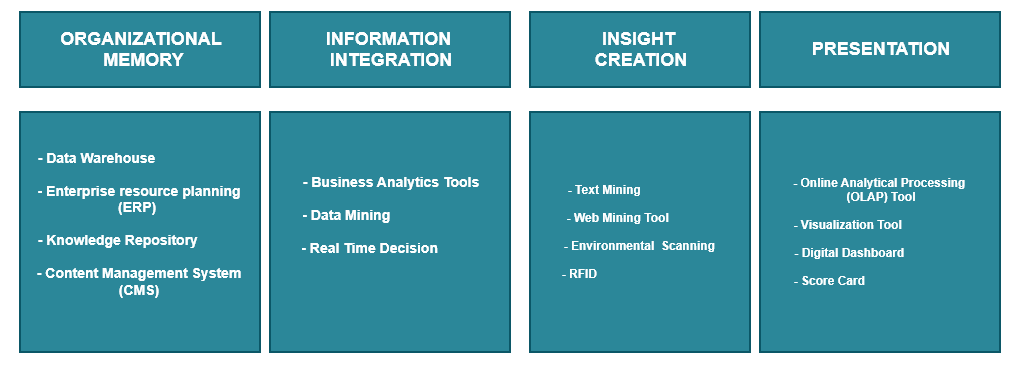


Fig 1 : Functional Architecture of Business Intelligence

**How BI works**



**3.2 Optimization**

**1. Your data strategy drives performance**

• Minimize the number of fields.

• Minimize the number of records.

• Optimize extracts to speed up future queries by materializing calculations, removing columns and the use of accelerated views

**2. Reduce the marks (data points) in your view**

• Practice guided analytics. There’s no need to fit everything you plan to show in a single view. Compile related views and connect them with action filters to travel from overview to highly-granular views at the speed of thought.

• Remove unnecessary dimensions from the detail shelf.

• Explore, Try displaying your data in different types of views.

**3. Limit your filters by number and type**

• Reduce the number of filters in use. Excessive filters on a view will create a more complex query, which takes longer to return results. Double-check your filters and remove any that aren’t necessary.

• Use an include filter. Exclude filters load the entire domain of a dimension while including filters do not. An include filter runs much faster than an exclude filter, especially for dimensions with many members.

• Use a continuous date filter. Continuous date filters (relative and range-of date filters) can take advantage of the indexing properties in your database and are faster than discrete data filters.

• Use Boolean or numeric filters. Computers process integers and Booleans (t/f) much faster than strings. Use parameters and action filters. These reduce the query load (and work across data sources).

**4. Optimize and materialize your calculations**

• Perform calculations in the database.

• Reduce the number of nested calculations.

• Reduce the granularity of LOD or table calculations in the view. The more granular the calculation, the longer it takes.

✓ LODs - Look at the number of unique dimension members in the

calculation.

✓ Table Calculations - the more marks in the view, the longer it will take to calculate.

• Where possible, use MIN or MAX instead of AVG. AVG requires more processing than MIN or MAX. Often rows will be duplicated and display the same result with MIN, MAX, or AVG.

• Make groups with calculations. Like include filters, calculated groups load only named members of the domain.

• Use Booleans or numeric calculations instead of string calculations. Computers can process integers and Booleans (t/f) much faster than strings. Boolean>Int>Float>Date>DateTime>String.

**4. KPI**

Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the disease.



As and when the system starts to capture the historical/periodic data for a user, the dashboards will be included to display charts over time with progress on various indicators or factors.

**4.1 KPIs (Key Performance Indicators)**

Key indicators displaying a summary of the Heart Disease and its relationship with different metrics.

1. Percentage of People Having Heart Disease

2. Age Distribution based on Gender.

3. Gender Distribution Based on Heart Disease

4. Chest Pain Experienced by People Suffering from Heart Disease.

5. Blood Pressure, Cholesterol Level and Maximum Heart Rate of

people according to their Age and Heart Disease Patients.

6. ST Depression Experienced by People According to their age and

heart disease.

**5 Deployment**

Prioritizing data and analytics couldn’t come at a better time. Your company, no matter what size, is already collecting data and most likely analysing just a portion of it to solve business problems, gain competitive advantages, and drive enterprise transformation. With the explosive growth of enterprise data, database technologies, and the high demand for analytical skills, today’s most effective IT organizations have shifted their focus to enabling self-service by deploying and operating Power BI at scale, as well as organizing, orchestrating, and unifying disparate sources of data for business users and experts alike to author and consume content.

Power BI prioritizes choice in flexibility to fit, rather than dictate, your enterprise architecture. Power BI Desktop and Power BI Service leverage your existing technology investments and integrate them into your IT infrastructure to provide a self-service, modern analytics platform for your users. With on-premises, cloud, and hosted options, there is a version of Power BI to match your requirements.