**Technical Documentation format – Data Analytics**

**Title of the project:**

**Abstract:**

* Provide a brief overview of the project objectives, methodologies used.

**Problem Statement:**

When COVID-19 hit, Karnataka's government ran into big problems handling the fast-growing number of COVID-positive patients. Dealing with patient info by hand from many sources and districts took too long and didn't work well. This scattered method made it hard to give up-to-date and useful info to thousands of frontline workers, which hurt patient care. The government needed one central automated system to bring together and match up patient data from different platforms. This was key to make sure patients got good care, hospitals used their resources well**.**

**Method:**

* Data gathering
* Data understanding
* Data cleaning
* Modelling
* Visualization
* EDA
* Statistical analysis
* Descriptive analysis

**Table of Contents:**

1. **Introduction:**

Fractal built a system to automate patient data management for Karnataka during COVID, improving care, resource allocation, and public health outcomes.

**Significance:**

* Got patients help faster.
* Made better use of limited resources.
* Helped leaders make smarter decisions.
* Supported efforts to stop the spread of the virus.
* Saved time for healthcare workers.
* Could handle a growing number of cases.

**Outline the goals and objectives**

Goals**:**

* Improve patient care by making data collection and sharing faster and more accurate.
* Help leaders make better decisions by giving them real-time data.
* Reduce deaths by ensuring patients get the care they need quickly.
* Stop the spread of the virus by aiding contact tracing and quarantine efforts.

Objective:

This project, visualized through a Python-powered Power BI dashboard, aims to create a centralized platform managing COVID-19 data across Karnataka. By automating data processing and integration, it facilitates real-time insights for improved patient care, resource allocation, and public health measures. This ultimately strives to enhance decision-making and optimize response efforts, leading to better patient outcomes

Define any key terms or concepts used throughout the documentation.

Features:

* Page Navigation
* Slicers
* Tooltip
* Drilldown

**2. Project Overview:**

* Describe the scope of the project, including the data sources used.

Scope:

Limitations:

**3. Data Collection:**

* Detail the process of data acquisition, including sources, formats, and any preprocessing steps.

Data Cleaning:

* Checked Data types
* Remove duplicates
* Remove null value-Mean, mode
* Remove unnecessary columns
* Split columns

Data Merge:

* Left join – Patients and test file

Data Modelling:

* One to many relation
* Many to one

Dax Functions:

1.HomeIsolationPatients =

CALCULATE(

COUNT('healthcare'[PatientID]),

'healthcare'[HealthcareRequirement] = "Home Isolation"

)

2. MortalityRate =

DIVIDE(

    CALCULATE(

        COUNT('healthcare'[PatientID]),

        'healthcare'[Outcome] = "Deceased"

    ),

    [Total Patients],

    0

)

3. No.ofHospitals =

DISTINCTCOUNT('healthcare'[Hospital])

4. No.ofHospitals =

DISTINCTCOUNT('healthcare'[Hospital])

5. TotalHospitalizedPatients =

CALCULATE(

    COUNT('healthcare'[PatientID]),

    'healthcare'[HealthcareRequirement] IN {"ICU", "HDU", "Regular Ward"}

)

6. Age Category =

SWITCH(

    TRUE(),

    patients\_test[Age] >= 0 && patients\_test[Age] <= 14, "Children",

    patients\_test[Age] >= 15 && patients\_test[Age] <= 24, "Youth",

    patients\_test[Age] >= 25 && patients\_test[Age] <= 64, "Adults",

    patients\_test[Age] >= 65, "Seniors",

    "Unknown"

)

7. AverageAge =

AVERAGE(patients\_test[Age])

8. ICU Patients = CALCULATE(

    COUNTROWS(Healthcare),

    Healthcare[HealthcareRequirement] = "ICU"

)

8. Percentage Home Isolation =

DIVIDE(

    CALCULATE(

        COUNTROWS(Healthcare),

        Healthcare[HealthcareRequirement] = "Home Isolation"

    ),

    COUNTROWS(Healthcare)

) \* 100

9. Total Patients =

COUNT(patients\_test[PatientID])

**4. Data Analysis:**

Charts

* Column chart
* Pie chart
* Donut chart
* Bar chart
* KPI card

**5. Implementation**

Address Non-Compliance: Analyse reasons and develop targeted interventions like educational materials or addressing social determinants of health.

Optimize ICU Resources: Assess ICU bed/staff needs based on patient data (24.6% ICU) and consider expanding capacity or optimizing allocation.

Enhance Data Collection: Ensure the dashboard captures crucial information like demographics, home isolation rates, and overall patient volume.

**6. Evaluation:**

The effectiveness of the follow-up improvements can be evaluated by tracking key metrics. We'll monitor if "Lost to Follow-Up" rates decrease and compliance rates improve. ICU resource allocation will be reviewed based on bed occupancy and staffing needs. Finally, we'll assess if the dashboard now captures all essential patient data. This multi-pronged approach will reveal the impact of the changes and guide further improvements.

**7. Conclusion:**

* Summarize the key findings and insights obtained from the analysis.

Key Findings and Insights Key Findings and Insights:

* Patient Demographics: The data appears to represent 1000 patients with a relatively even spread across four age groups and slightly more females than males.
* Risk Factors: There are four risk factor categories, with higher prevalence among Seniors and Adults compared to Children and Youth. Discuss the implications of the results and any recommendations for future work.
* Healthcare Resource Utilization: Overall utilization is currently low (19.74%). Most patients (754) are recovering at home, utilizing resources like home isolation. However, data on bed occupancy by type (regular, HDU, ICU) is incomplete.

Implications:

* The low resource utilization could be due to decreased healthcare demand or overallocation in anticipation of a surge.
* The distribution of patients by risk factors and healthcare needs suggests a potential link between risk factors and resource utilization (e.g., higher risk patients requiring hospitalization).

Incomplete data on bed occupancy by type limits understanding of the specific resource needs.

Recommendations:

* Investigate the reasons behind the high prevalence of risk factors in Seniors and Adults.
* Analyse the correlation between risk factors and healthcare resource utilization (hospitalization, ICU care).
* Consider targeted interventions to address risk factors in high-risk populations (Seniors, Adults).
* Obtain complete data on bed occupancy by type (regular, HDU, ICU) for better resource allocation.

**8. References:**

Python, SQL, pandas, NumPy ,matplotlib ,seaborn

**9. Appendices:**

* Include supplementary materials such as additional data tables, code listings, or technical specifications.