BrightLearn Data Analytics Case Study Project Plan & Project Outcome

Case Study: Hospital Readmission Analysis Analyst: Musawakhe Andrew Nzama Date: 30/11/2025

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1. PROJECT PLAN

1.1 Objective - Analyze hospital patient readmission data to identify trends, patterns, and risk factors. - Provide actionable, data-driven recommendations to reduce readmissions and improve patient care.

1.2 Scope - Dataset: Hospital patient admissions and readmissions. - Analysis Dimensions: - Patient demographics (age, gender) - Medical history and diagnoses - Admission frequency and readmission patterns - Department-specific readmission trends - Deliverables: - SQL queries for data extraction - Data analysis & visualization (Python / Tableau / Power BI) - Dashboard for hospital management - Insights and recommendations report

1.3 Tools & Technologies - Data Analysis: Python (pandas, numpy, matplotlib, seaborn) - Database: SQL (MySQL / PostgreSQL) - Visualization / Dashboard: Power BI / Tableau / Looker - Version Control: GitHub

1.4 Project Timeline

Phase	Tasks	Timeline
Data Collection & Cleaning	Load dataset, handle missing values, clean data	Day 1-2
Exploratory Data Analysis	Demographics, admission patterns, correlations	Day 3-4
SQL Data Queries	Write queries for readmission counts, trends	Day 4
Visualization & Dashboard	Charts, trends, department heatmaps	Day 5-6
Insights & Recommendations	Identify risk factors, suggest interventions	Day 6-7
Documentation & Submission	README, presentation, GitHub submission	Day 7

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1. PROJECT OUTCOME

2.1 Key Insights - Readmission Trends: - Patients aged 51–70 had the highest readmission rate. - Departments with most readmissions: Cardiology and General Surgery. - Risk Factors: - Patients with multiple comorbidities are more likely to be readmitted. - Short intervals between discharges increase likelihood of readmission. - Demographics: - Gender distribution had minimal impact on readmission likelihood.

2.2 Data-Driven Recommendations 1. High-Risk Patient Monitoring: Implement post-discharge follow-ups for patients aged 51+ with comorbidities. 2. Department Focus: Prioritize Cardiology and General Surgery for readmission reduction programs. 3. Preventive Care Interventions: Develop care plans and education

programs for patients with frequent admissions. 4. Performance Tracking: Use dashboards to monitor monthly readmission trends and effectiveness of interventions.

2.3 Deliverables - SQL Queries: For extracting and summarizing readmission data. - Visualizations: Age group distribution, readmission trends, department heatmaps. - Dashboard: Interactive dashboard displaying metrics, trends, and risk areas. - Documentation: README, presentation slides, and project report.

2.4 Conclusion - Demonstrates ability to independently explore data, identify patterns, and communicate insights. - Provides actionable recommendations for improving hospital performance and patient care.