Final Projects Descriptions

Business Analytics for Decision Making

Group PS_8058

Final Project Description for Group PS_8058

Project Title: AI-Enhanced Business Analytics: Final Project on Strategic Insight Generation and Visualization

Overview

The capstone project for **Group GP_PS_8058** is designed to evaluate students' ability to apply business analytics and artificial intelligence principles in realistic, data-rich contexts. Each student is required to select one dataset from a curated collection of **95 simulated industry datasets**, carefully developed to mirror diverse business domains, including construction, healthcare, pharmaceuticals, manufacturing, logistics, education, energy, information technology, defense, and financial services.

The datasets included in this collection are intentionally structured to simulate complex operational environments, providing students with opportunities to practise the entire analytics lifecycle: from raw data ingestion and exploratory data analysis (EDA), through to transformation, visualization, and the articulation of actionable business intelligence.

This capstone is not only an academic requirement but also a simulated professional exercise, reflecting the role of a consultant who must bridge data insights with organizational decision-making. By integrating **AI methodologies** such as predictive modeling, segmentation, clustering, forecasting, or optimization, students will demonstrate how analytics moves beyond descriptive reporting to generate prescriptive and strategic insights.

Ultimately, the project serves as a platform for students to showcase creativity, analytical rigor, and business acumen, reinforcing their preparedness for professional roles where data-driven strategies and AI-enhanced decision-making are central to organizational success.

Instructions

This project requires each student to:

- Select one dataset from the **curated set of 95 industry-simulated datasets** provided in the *Dataset Descriptions_GP_PS_8058* document (Likely dataset at the end of the document).
- Conduct a complete analysis workflow: data cleaning, transformation, exploration, visualization, and interpretation.
- Build an **interactive Power BI dashboard** that communicates insights in a dynamic and user-friendly way.

- Produce a **comprehensive written report** that documents the methodology, analysis, visualizations, and AI-powered recommendations in a professional academic format.

The selected dataset forms the foundation of the analysis. Students are expected to critically assess patterns, trends, and outliers, and to translate their findings into strategic recommendations aligned with business goals.

Scope of the Project

1. **Data Analysis** – Conduct exploratory and statistical analysis of both qualitative and quantitative variables.
2. **Data Transformation** – Apply advanced feature engineering, data cleaning, and integration methods.
3. **Dashboard Design** – Develop a dynamic dashboard with multiple forms of interactivity (slicers, filters, drill-throughs).
4. **Business Recommendations** – Propose actionable and AI-supported strategies (e.g., forecasting, clustering, segmentation, optimization) that address organizational challenges.

Project Deliverables

A. Interactive Power BI Dashboard

- Include at least **five visualization types** (e.g., bar chart, scatter plot, pie chart, heatmap, map).
- Ensure functionality through **slicers, filters, and drill-throughs**.
- The dashboard should be executive-friendly, supporting professional decision-making.

B. Comprehensive Written Report (10–15 pages)

- **Title Page**: Project title, student registration number, group information.
- **Introduction**: Summary of the dataset, objectives, and business relevance.
- **Methodology**: Explanation of data cleaning, transformation, derived metrics, and handling of missing values.
- **Analysis and Insights**: Key findings from exploratory and advanced analytics.

- **Dashboard Summary**: Discussion of dashboard structure, visualizations, and decision relevance.
- **Business Recommendations**: AI-powered strategies and their practical implications.
- **Conclusion**: Reflection on findings, significance, and organizational application.

Formatting Requirements:

- Font: Aptos, Size 12, Line spacing: 1.5, Margins: 0.2 inch.
- Integration of labeled charts, tables, and figures is mandatory.

Assessment Criteria (40 Marks)

Component	Marks	Description
Dashboard Design	12	Relevance, clarity, interactivity, and communication of insights
EDA and Insights	12	Analytical depth, identification of patterns, and interpretation
Written Report	8	Structure, clarity, academic rigor, and explanation of business context
AI-Driven Strategies	5	Creativity, feasibility, and practical value of AI recommendations
Overall Presentation	3	Professionalism, coherence, and alignment between visuals and text

Submission Guidelines

- Submit both your **Power BI file (xxx.pbix)** and **final report (xxx.pdf)** through **Moodle** by **October 10, 2025, 11:59 PM**.
- **File Naming Format**: RegNo_GP_PS_DatasetName.
- **Late Submissions**: A penalty of 10% per day will apply.
- This is an **individual project**; plagiarism or unauthorized collaboration will result in immediate disqualification.
- Projects that do not adhere to the structural or formatting guidelines will be subject to mark deductions.

Final Note

This capstone project is an opportunity to integrate all knowledge and tools acquired throughout the course into a professional-standard outcome. Students are encouraged to

apply **advanced analytics, DAX measures, and AI forecasting methods** where appropriate. Deliverables should demonstrate not only technical proficiency but also strategic judgment, creativity, and the ability to communicate complex insights effectively.

By situating the project within realistic, industry-modeled contexts, the assignment bridges academic learning with professional practice. It ensures that graduates of Group GP_PS_8058 are equipped to translate data into intelligence and drive innovation in AI-powered business environments.

Mapping Sample Datasets to Project Directions

To support students in identifying how their chosen dataset aligns with the objectives and deliverables of the capstone project, the following examples illustrate potential applications across key domains. Each mapping highlights the analytical focus, dashboard opportunities, and AI-powered strategies that can be developed.

1. Construction Industry

Sample Dataset: *Construction Project Performance Analytics (CPPA-1000)*

- **Analytical Focus:** Tracking project KPIs such as schedule adherence, budget utilization, contractor performance, and incident management.
- **Dashboard Opportunities:** Interactive timelines of project milestones, cost vs. budget variance heatmaps, contractor performance drill-downs.
- **AI-Powered Strategies:** Predictive modeling for project delays; clustering of contractors based on quality and cost performance; optimization models for resource allocation.

2. Healthcare Sector

Sample Dataset: *Ismailia Healthcare IT Transformation*

- **Analytical Focus:** Monitoring patient records, digital adoption metrics, and efficiency of hospital IT systems.
- **Dashboard Opportunities:** Patient flow dashboards, system usage trends, KPIs on digital service adoption.
- **AI-Powered Strategies:** Forecasting patient demand on IT systems; classification of patient satisfaction risk groups; AI-based optimization of staffing during peak hours.

3. Pharmaceuticals and Retail

Sample Dataset: *Pharmacy Administration in South Sinai*

- **Analytical Focus:** Sales distribution, prescription patterns, and customer engagement across branches.
- **Dashboard Opportunities:** Branch-level comparison of sales, shift-level performance, mode-of-payment breakdowns.

- **AI-Powered Strategies:** Demand forecasting for medicines; segmentation of customers based on buying behavior; optimization of promotions and inventory management.

4. Financial Services

Sample Dataset: *CIB Corporate Credit Risk*

- **Analytical Focus:** Credit approval, repayment behavior, and risk profiling of corporate clients.
- **Dashboard Opportunities:** Risk exposure heatmaps, client portfolio segmentation, trend analysis of non-performing loans.
- **AI-Powered Strategies:** Predictive modeling for default risk; clustering of clients by financial health; prescriptive recommendations for risk mitigation policies.

5. Manufacturing

Sample Dataset: *Ezz Steel Sales Analytics*

- **Analytical Focus:** Production output, sales by region, and supply chain performance.
- **Dashboard Opportunities:** Regional sales dashboards, KPI tracking of production efficiency, order fulfillment analysis.
- **AI-Powered Strategies:** Forecasting steel demand by region; clustering of clients by consumption patterns; optimization of production planning to minimize waste.

6. Logistics and Operations

Sample Dataset: *Integrated Site Operations and Performance Analytics*

- **Analytical Focus:** Fleet performance, site inspections, and operational efficiency.
- **Dashboard Opportunities:** KPI dashboards for fleet utilization, compliance monitoring, and inspection pass rates.
- **AI-Powered Strategies:** Predictive analytics for fleet breakdowns; segmentation of sites by compliance scores; optimization of maintenance scheduling.

7. Corporate Leadership and HR

Sample Dataset: *Corporate Leadership Performance Analytics*

- **Analytical Focus:** Employee productivity, leadership evaluation, and succession planning.
- **Dashboard Opportunities:** Leadership performance heatmaps, employee engagement dashboards, team comparison visualizations.
- **AI-Powered Strategies:** Predicting leadership potential using performance indicators; clustering employees for targeted training; optimization of succession planning models.

Integration with Deliverables

These mappings illustrate how each dataset can be translated into:

1. **Interactive Power BI Dashboards** with meaningful KPIs, interactivity, and professional design.
2. **Comprehensive Reports (10–15 pages)** documenting EDA, transformation steps, insights, and business relevance.
3. **AI-Powered Recommendations** that move beyond descriptive reporting to predictive and prescriptive insights, directly aligned with the assessment criteria of the capstone project.

By following this approach, students can ensure that their project not only demonstrates technical proficiency but also delivers **strategic, AI-enhanced value** that mirrors real-world consulting and decision-making practices.