***Power BI Sales Analytics with AI Capabilities***

**Problem Statement**

Businesses face challenges in monitoring sales performance, forecasting future trends, and identifying opportunities or risks due to the fragmentation of data across categories (e.g., Electronics, Household), locations (e.g., Bangalore, Delhi), and time periods. The goal is to create a comprehensive tool that provides real-time insights, accurate forecasting (with 99.72% accuracy), and proactive management to optimize inventory, resources, and revenue in a volatile market influenced by holidays and seasonal fluctuations.

**Approach**

* Data Collection and Integration: Aggregated data from CSV files (daily/monthly sales, drilldown details, geo-sales with latitude/longitude, holidays) and executive summaries. Used Power BI for ETL (Extract, Transform, Load) processes.
* Visualizations: Created donut charts for product categories, bar charts for location breakdowns, line charts for trends, and geographic maps using latitude/longitude data.
* Forecasting: Applied time-series models (e.g., Prophet-like algorithm) to generate **n-day sales** and revenue predictions, including upper/lower bounds and accuracy metrics (e.g., MAPE at 160%, standard deviation of 446.214)..
* AI and Advanced Analytics: Integrated machine learning for anomaly detection, heatmap matrices for category-location correlations, holiday impact analysis, and risk scoring.
* Tools: Power BI Desktop for dashboard creation, with interactive filters for dates, locations, and categories.

**Key Metrics**

* Key Metrics: Total sales quantity: 71,471 units; Total revenue: ₹4.89M; Average daily sales: ₹585.83; Top category: Electronics (19K units, 27.28% share); Top location: Bangalore.
* Sales Trends: Monthly sales: April (20,298), May (17,245), June (15,816), July (18,112). Daily sales peaked at 1,962 on April 21 and 1,962 on other high days.
* Forecasting Outcomes: Next **n-day** average forecasted sales: ~584 units/day; Revenue projections stable (e.g., ₹41,106 on July 31, dropping to ₹19,452 on August 1). Forecast accuracy: 99.72%, with bounds showing low volatility.
* Geographic Insights: Bangalore led with strong Electronics sales; Heatmaps revealed correlations like high Household sales in Delhi
* Anomaly and Holiday Impact: Detected seasonal dips (e.g., around holidays like Good Friday on April 18); AI identified a strong downward trend (-198 predicted uplift) and opportunities in Beverages.

**Project Highlights**

* Electronics dominates revenue (27.28%), accounting for ~69% of sales from the top 3 categories, reducing risk through portfolio balance.
* Forecasting accuracy of 99.72% enables reliable **n-day** planning, with stable forecasts (e.g., 2.0K-2.6K daily range) and controlled variance for inventory optimization.
* AI-driven features like anomaly detection and holiday analysis (e.g., impact from Buddha Purnima on May 12) provide proactive alerts, identifying growth in underperforming segments like Beverages (14.13% share).
* Interactive Power BI dashboard offers real-time insights, enabling dynamic filtering by date, location, and category for tailored decision-making.
* Geographic focus: Top cities (Bangalore, Chennai) show consistent demand; Interactive maps highlight market penetration opportunities in Kolkata and Mumbai.
* Overall business impact: Enables data-driven decisions for resource allocation, risk mitigation, and revenue growth in a predictable sales environment.