**📊 Predictive Layer Report**

**🔮 Objective**

The Predictive Layer leverages historical pizza sales data to **forecast future sales trends** at both the overall level and by category. This helps business stakeholders anticipate demand and plan ahead for inventory, staffing, and promotions.

The predictive layer adds forward-looking intelligence to the pizza sales dashboard by using forecasting models on the historical data. Two line chart visuals were created:

1. **Overall Sales Forecast** (Total Price vs Order Date with forecasting)
2. **Category-Wise Sales Forecast** (Line chart with slicer for Classic, Supreme, Veggie, and Chicken pizzas)

**📌 Key Insights**

1. **Overall Sales Forecast (Top Chart)**
   * Forecast line shows the **expected total sales trajectory** for the coming period.
   * Shaded grey band indicates the **confidence interval** (range of possible outcomes).
   * Current prediction shows a **growth trend of ~7.5%**, suggesting strong demand continuation.
2. **Category-Level Forecast (Bottom Chart with Slicer)**
   * Users can select **Chicken, Classic, Supreme, or Veggie pizzas** to view **category-specific forecasts**.
   * Each category shows its own demand trend and seasonality.
   * Actionable for **menu planning** and **inventory control** (e.g., more cheese and chicken stock if those categories trend upward).

**✅ Actionable Recommendations**

* **Inventory Planning:**  
  Pre-stock raw materials based on the forecasted growth. For example, if **Classic pizzas** are predicted to peak in upcoming weeks, ensure higher ingredient availability.
* **Promotions & Marketing:**  
  Run targeted offers in low-growth categories (e.g., if Veggie demand dips, push discounts or bundle deals).
* **Staffing Decisions:**  
  Use weekly sales predictions to optimize kitchen staff and delivery staff scheduling.
* **Category Strategy:**  
  Focus R&D and new product launches around **fast-growing categories** to ride the demand wave.

**Overall Sales Forecast**  
The forecast line indicates a steady upward trend in overall sales, with noticeable peaks around weekends.

* **Action:** Increase bulk procurement of core ingredients such as cheese, flour, and packaging material by **10% in advance** to ensure uninterrupted supply.
* **Action:** Extend delivery hours and allocate additional staff on **Fridays and Saturdays** to maximize revenue during peak demand periods.

**Category-Wise Sales Forecast**  
When sliced by pizza categories, distinct demand patterns emerge:

* **Classic Pizzas:** Forecasts show consistently high and stable demand.
  + **Action:** Position Classic pizzas as the **default highlight** on menus and online platforms to maintain strong sales momentum.
* **Supreme Pizzas:** The forecast reveals fluctuations with visible peaks in specific months.
  + **Action:** Introduce **seasonal combo promotions** during peak months to capture surges in demand.
* **Veggie Pizzas:** The forecast line remains comparatively flat, indicating limited growth.
  + **Action:** Optimize inventory by slightly **reducing fresh vegetable stock**, while also testing a **new Veggie flavor** to stimulate customer interest.
* **Chicken Pizzas:** Forecasts show occasional spikes in demand.
  + **Action:** Launch **“Weekend Chicken Feast” campaigns** to align promotions with forecasted high-demand weeks