**Data Spark: Illuminating Insights for Global Electronics**

**Dataset Details:**

1. Customer.csv
2. Strore.csv
3. Sales.csv
4. Product.csv
5. ExchangeRate.csv

**Data cleaning and preparation:**

1. A duplicate row and null value check was performed on key columns, including customer key, order number, and product number.
2. Null values were identified in 10 rows of the state code field within the customer file, and these were filled with 'NAP' first 3letter of country name.
3. An 'age' column was created in the customer dataset using the date of birth field.
4. The delivery date column in the sales dataset had over 50% null values, so it was removed due to its lack of significant impact on the analysis.
5. The sales dataset contained $ symbols in the Unit Cost and Unit Price columns, which were removed to facilitate calculations.
6. Necessary formatting adjustments were made to the data columns, including converting strings, decimals, and integers where required.

A Power BI dashboard was created using the cleaned data and integrated into the MySQL database.

**Customer Data Insights:**

* **Gender Breakdown:**
  + Percentage of male, female, and other gender categories.
  + **Actionable Insight:** Targeted advertising based on the gender in customer base.
* **Age Distribution:**
  + Customers are segmented into age groups (e.g., 18-25, 26-35, etc.).
  + Highlight the largest customer age group.
  + **Actionable Insight:** Offer age-relevant products or services, and curate content marketing based on popular age groups.
* **Geographical Distribution:**
  + City, state, country, and continent-wise distribution.
  + **Actionable Insight:** Focus on regions with the highest customer density for promotions and product distribution.

**Actionable Recommendations:**

1. **Personalized Marketing**: Based on demographics, tailor offers, ads, and messages to resonate with specific age groups and locations.
2. **Loyalty Programs**: Develop reward systems for high-frequency buyers to increase retention and encourage repeat purchases.
3. **Geographical Expansion**: Based on location analysis, consider expanding operations or distribution centres in high-concentration areas.

**Sales Data Insights:**

* **Goal:** Understand the total sales trends over time, identify seasonal patterns, and assess the overall business trajectory.

**Key Insights:**

* **Total Sales Trends:**
  + Analysed total sales figures across different time periods (yearly).
  + To Identify upward or downward trends.
  + **Actionable Insight:** Focus marketing and promotional efforts during peak periods and introduce campaigns during slow seasons.
* **Seasonality:**
  + Identified periods of increased or decreased sales activity (e.g., holiday seasons, Black Friday).
  + **Actionable Insight:** Plan inventory, staffing, and promotions around key high-demand seasons to maximize revenue.

**Actionable Recommendations:**

1. **Trend-Based Marketing**: Leverage identified sales trends and seasonality to design timely campaigns that align with peak sales periods.
2. **Product Strategy**: Increase focus on best-selling and high-revenue products for promotions while considering stock adjustments for low-performing items.

**Product Data Insights:**

* **Goal:** Identify which products are driving sales and which are underperforming to optimize inventory and marketing efforts.

**Key Insights:**

* **Most Popular Products:**
  + Identified the top-selling products based on the number of units sold or revenue generated.
  + **Actionable Insight:** Promote these products more heavily, ensure they’re well-stocked, and consider bundling with other products for cross-selling opportunities.
* **Least Popular Products:**
  + Highlight the products with the lowest sales.
  + **Actionable Insight:** Investigate why certain products are underperforming (e.g., pricing, lack of awareness, or low demand). Consider discounting, rebranding, or discontinuing these products.
* **Product Sales Distribution:**
  + Show how sales are distributed across all products. This helps to identify if a few products dominate or if sales are spread evenly.
  + **Actionable Insight:** Focus on broadening the sales mix if there’s over-reliance on a few key products.

**Actionable Recommendations:**

1. **Product Promotions**: Focus on heavily promoting the top-selling products and identify opportunities for cross-selling or bundling with less popular products to clear slow-moving inventory.
2. **Profit Margin Optimization**: Prioritize high-margin products in marketing campaigns and explore ways to reduce costs for low-margin products (e.g., renegotiate supplier deals, adjust shipping).
3. **Price Adjustments**: For products with low sales but high potential, consider adjusting pricing or creating discounts to stimulate demand without sacrificing profitability.

**Store Data Insights:**

**Key Insights:**

* **Sales by Store:**
  + Analyse sales figures for each store and rank them from best to worst performers.
  + **Actionable Insight:** Focus on optimizing operations, staffing, and inventory for high-performing stores. For low-performing stores, analyze whether factors like location, staff, or product selection are affecting sales.

**Actionable Recommendations:**

1. **Optimize Store Efficiency**: Based on sales per square meter, focus on improving the layout and product placement in larger stores with low efficiency. For smaller but high-performing stores, consider expanding product lines or increasing inventory.