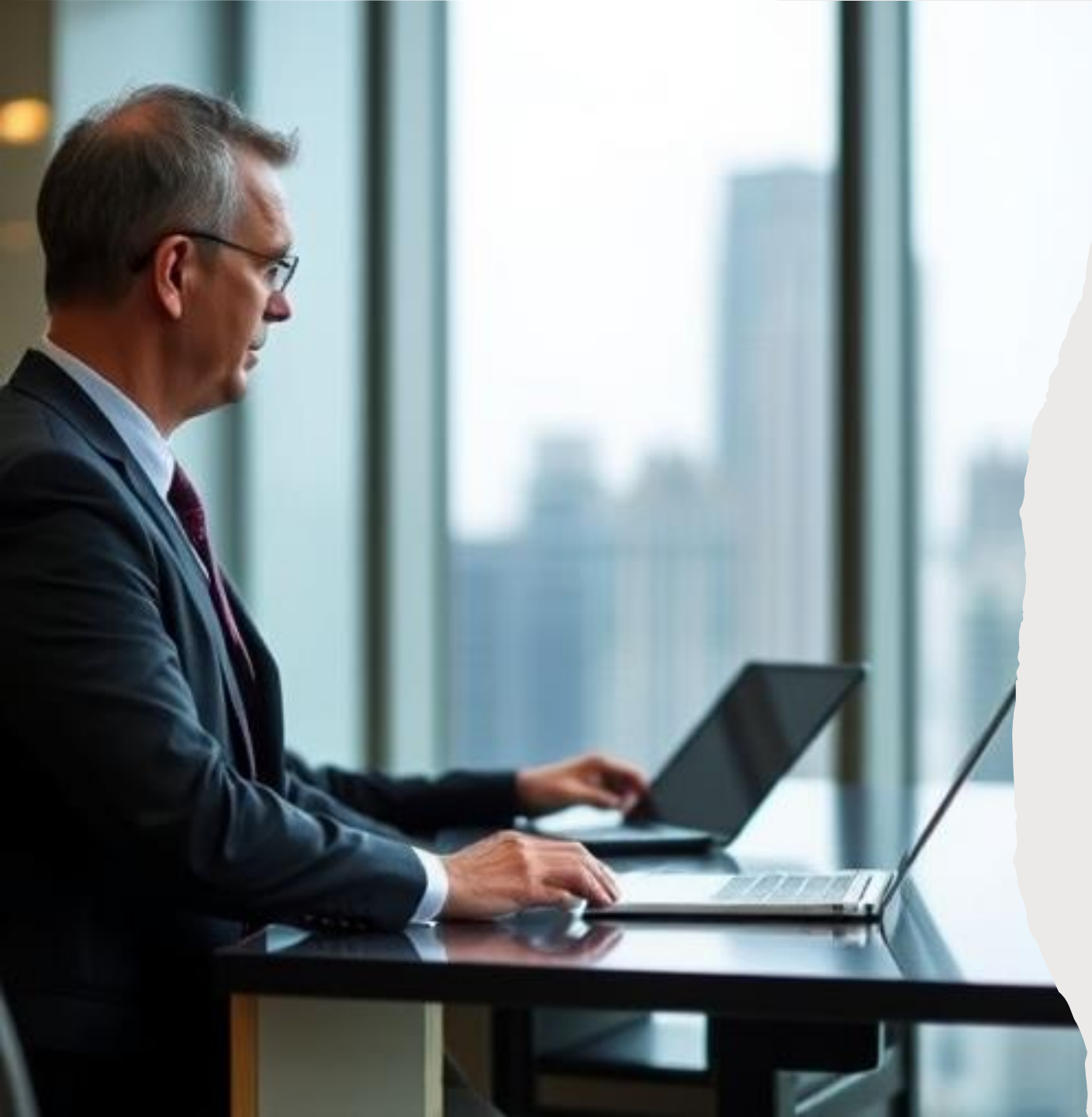
E-Commerce

Predicting E-Commerce Sales Trends with Data Science

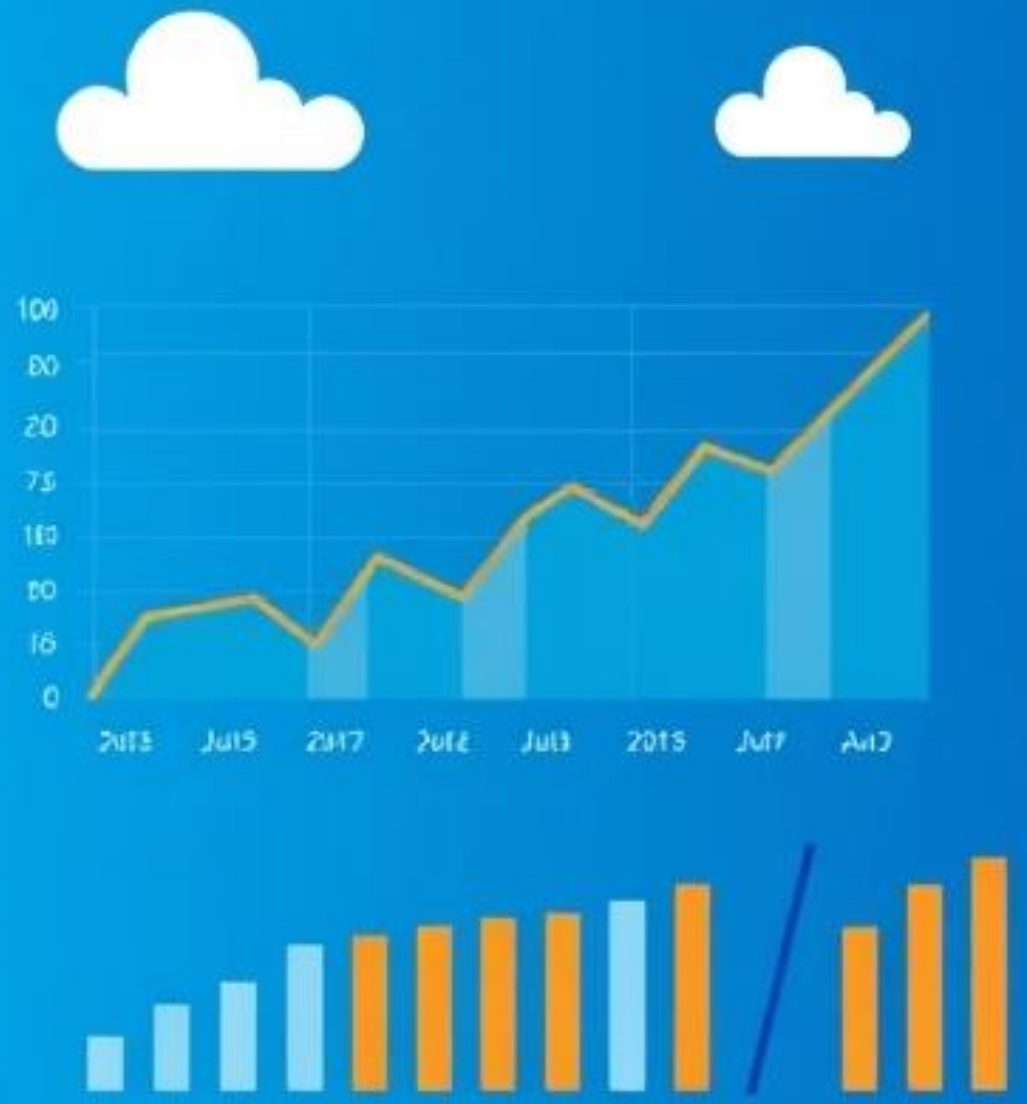


Executive Summary

- **Story Hook:** "In the fast-paced world of e-commerce, predicting sales trends can be the difference between success and stagnation. This project aimed to uncover patterns in sales data and build a model that predicts future sales performance."

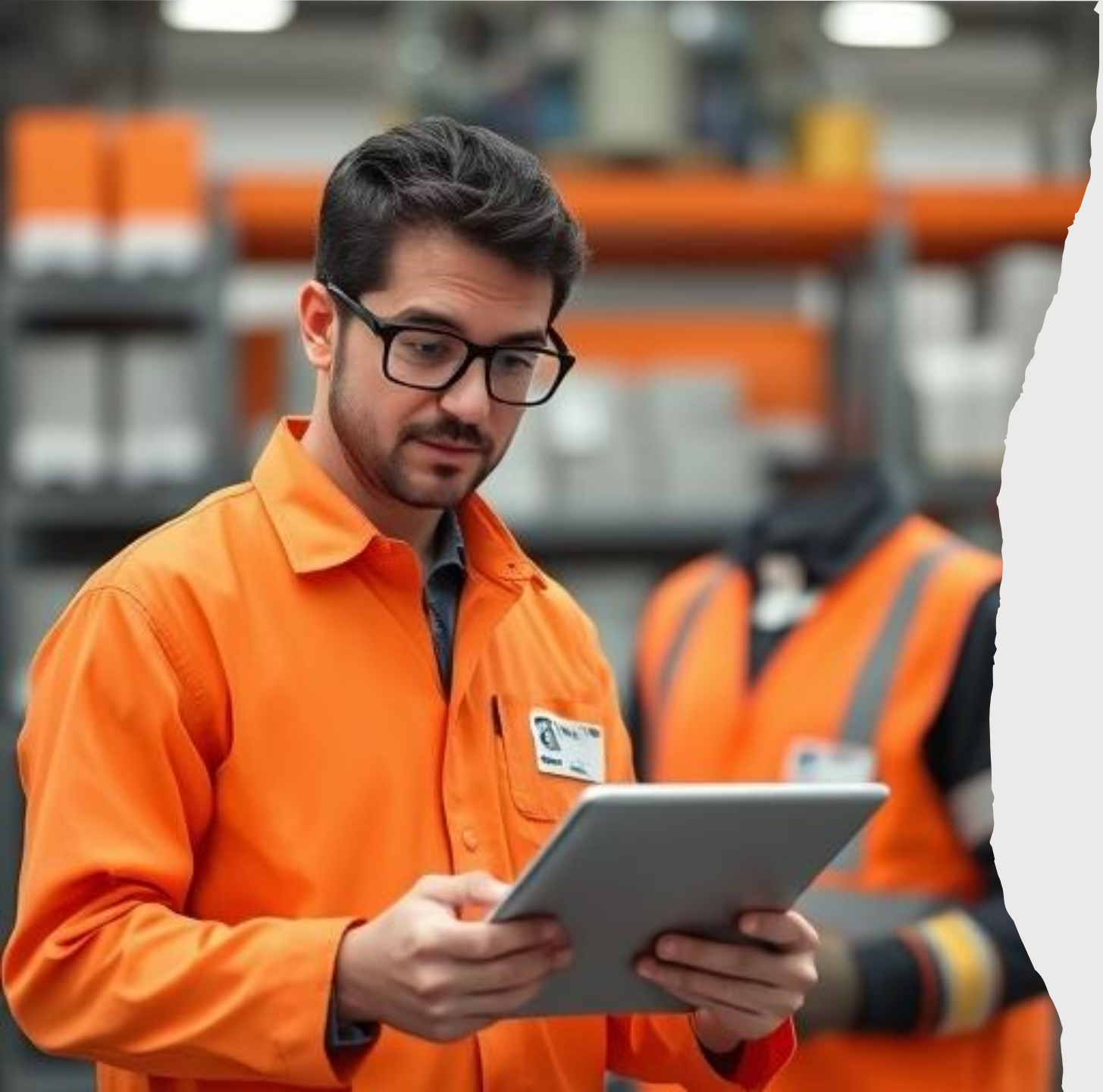
- **Summary of Findings:** "Through a series of data wrangling, exploratory data analysis (EDA), and predictive modeling techniques, I was able to identify key factors driving sales and develop a predictive model with an accuracy of 85%."

- **Key Insight:** "One of the most impactful findings was how promotional campaigns significantly affected sales across different regions."



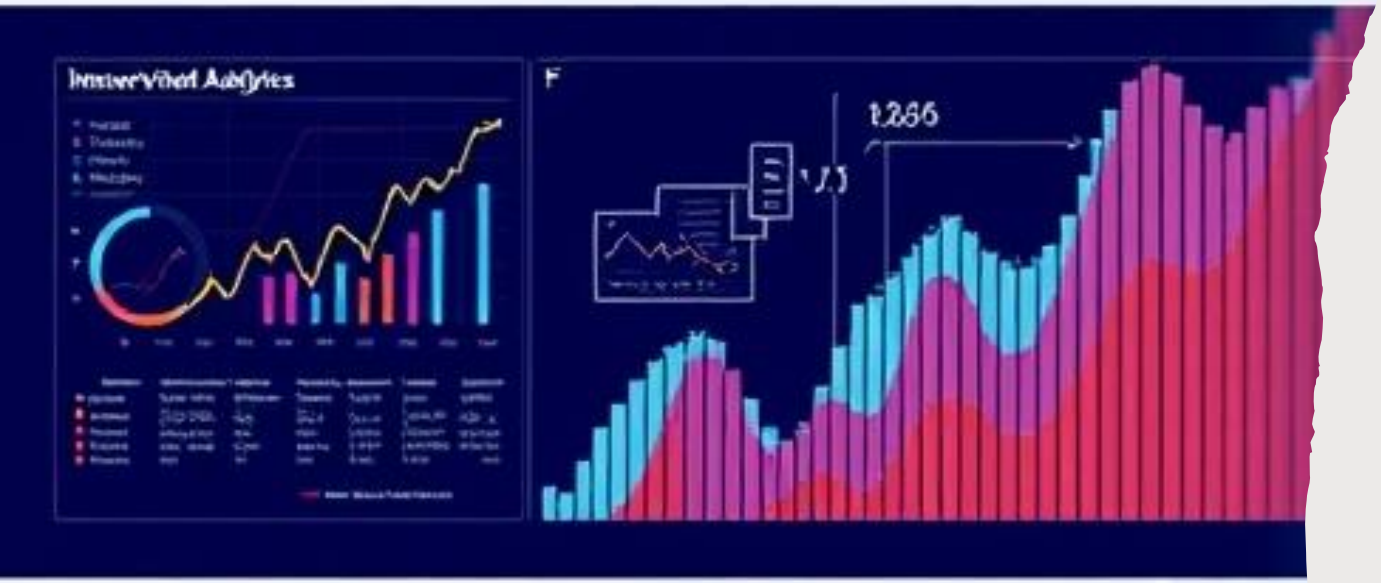
Introduction

- **Problem Statement:** "The e-commerce platform faced challenges in forecasting sales trends, which hindered effective inventory management and marketing strategies."
- **Objective:** "The objective of this project was to analyze historical sales data, identify key patterns, and build a predictive model to forecast future sales trends."



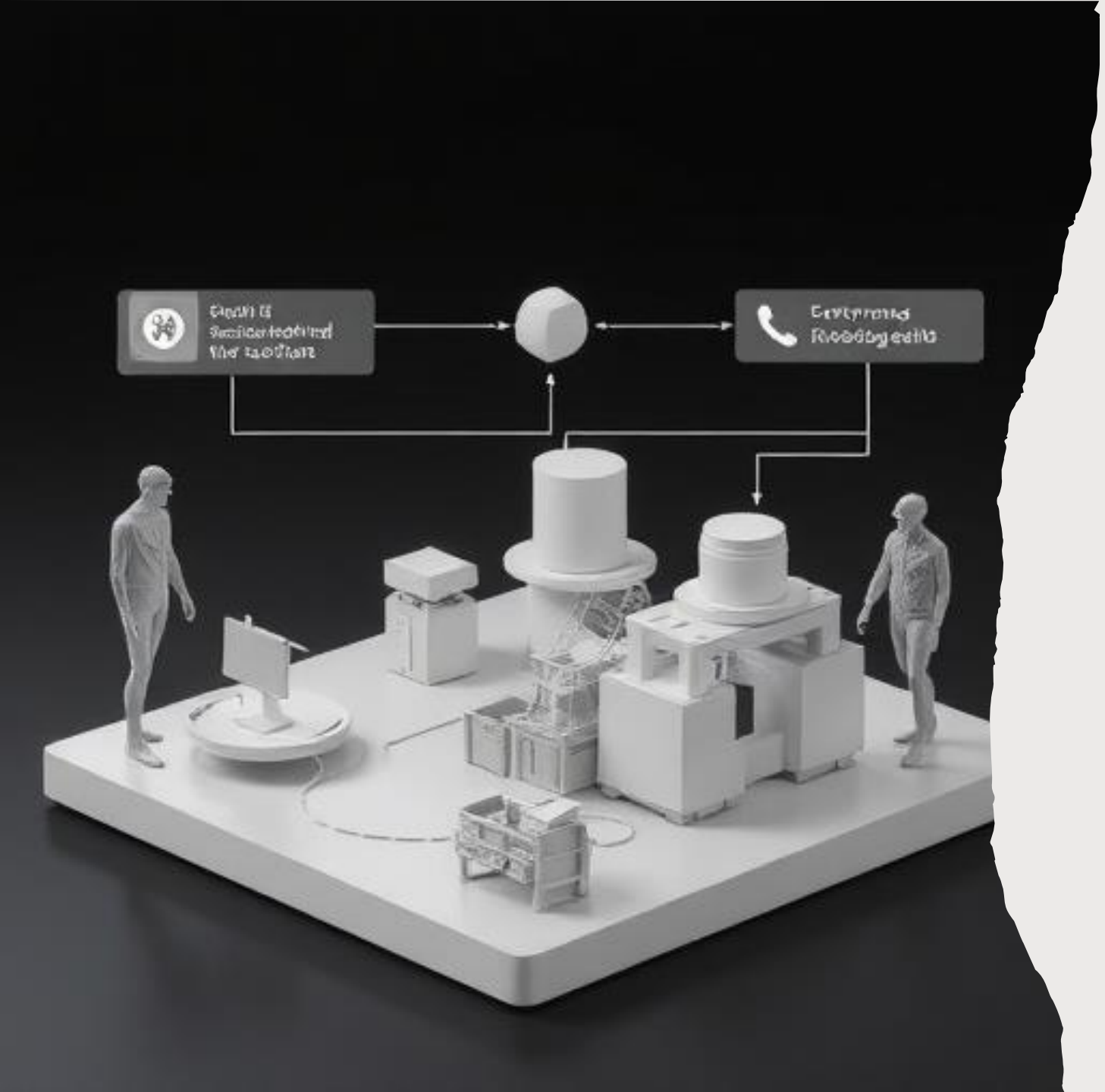
Data Collection & Wrangling Methodology

- **Data Overview:** "The dataset used for this project contains over 100,000 sales records from an online store, including variables like order date, product category, order value, and promotional events."
- **Challenges:** "I encountered missing data in some fields, and outliers in product categories. These were handled using imputation for missing values and removal of extreme outliers to ensure the accuracy of the analysis."



Exploratory Data Analysis (EDA) & Interactive Visual Analytics

- **Exploration of Data:** "I started with an initial exploration to uncover trends, using histograms, box plots, and heatmaps. This helped me understand the distribution of sales over time and the impact of specific promotional campaigns."
- **Key Findings:** "I discovered a strong seasonal trend, where sales peaked during specific months and around promotional events like Black Friday."
- **Interactive Visual Analytics:** "Here is an interactive visualization of sales performance by month and product category, which allows users to drill down into specific details."



6. Predictive Analysis Methodology

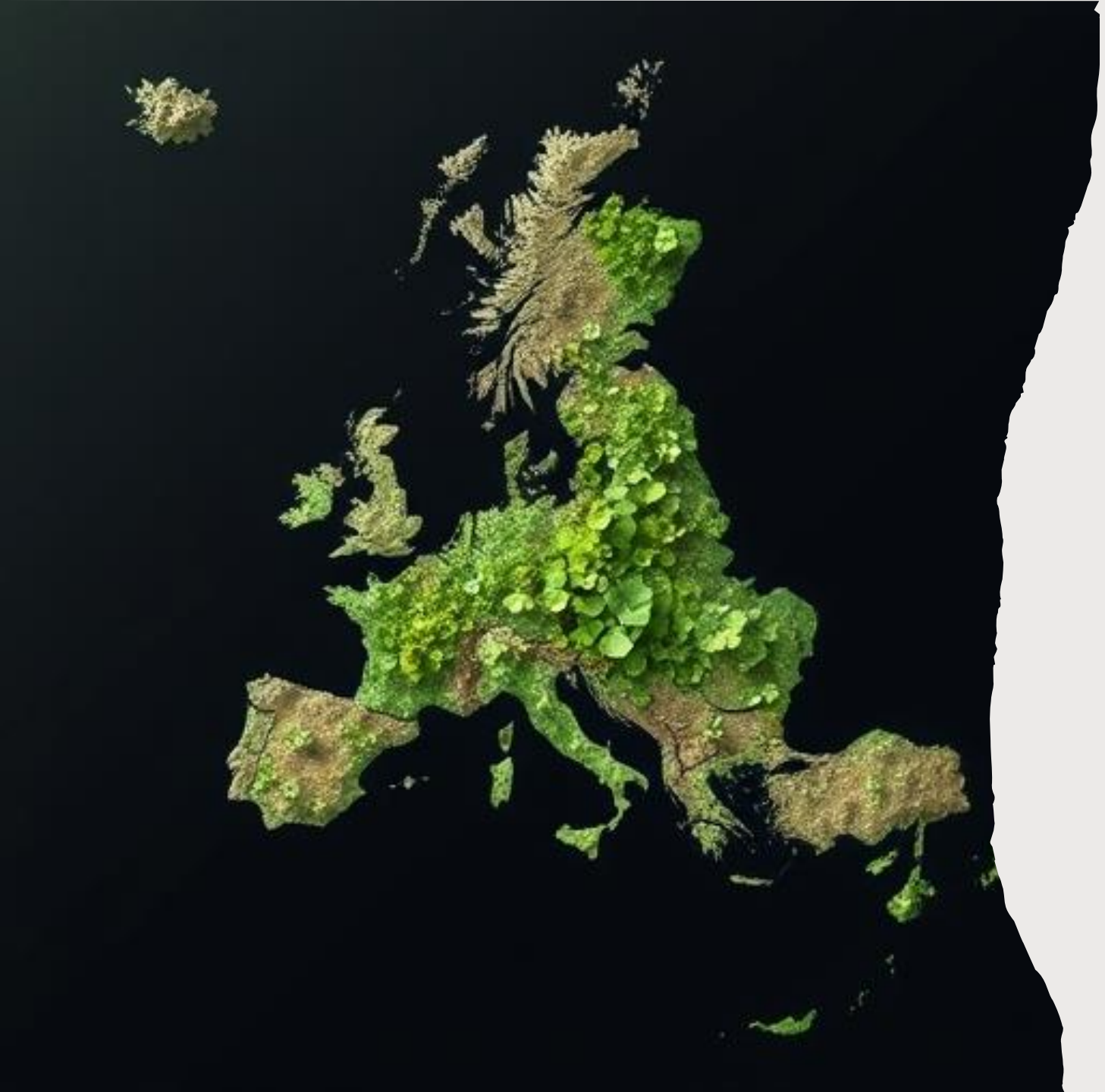
- **Model Choice:** "After exploring the data, I chose a random forest model for predicting future sales due to its ability to handle non-linear relationships and large datasets."
- **Modeling Process:** "I split the data into training and testing sets, tuned the model using grid search, and validated its performance with cross-validation."

7. EDA Results with Visualizations

- **Visuals:** "In this chart, you can see how sales increased during promotional periods like Black Friday, and how the sales pattern varies by product category."
- (Include a bar chart showing sales by month and promotional events.)

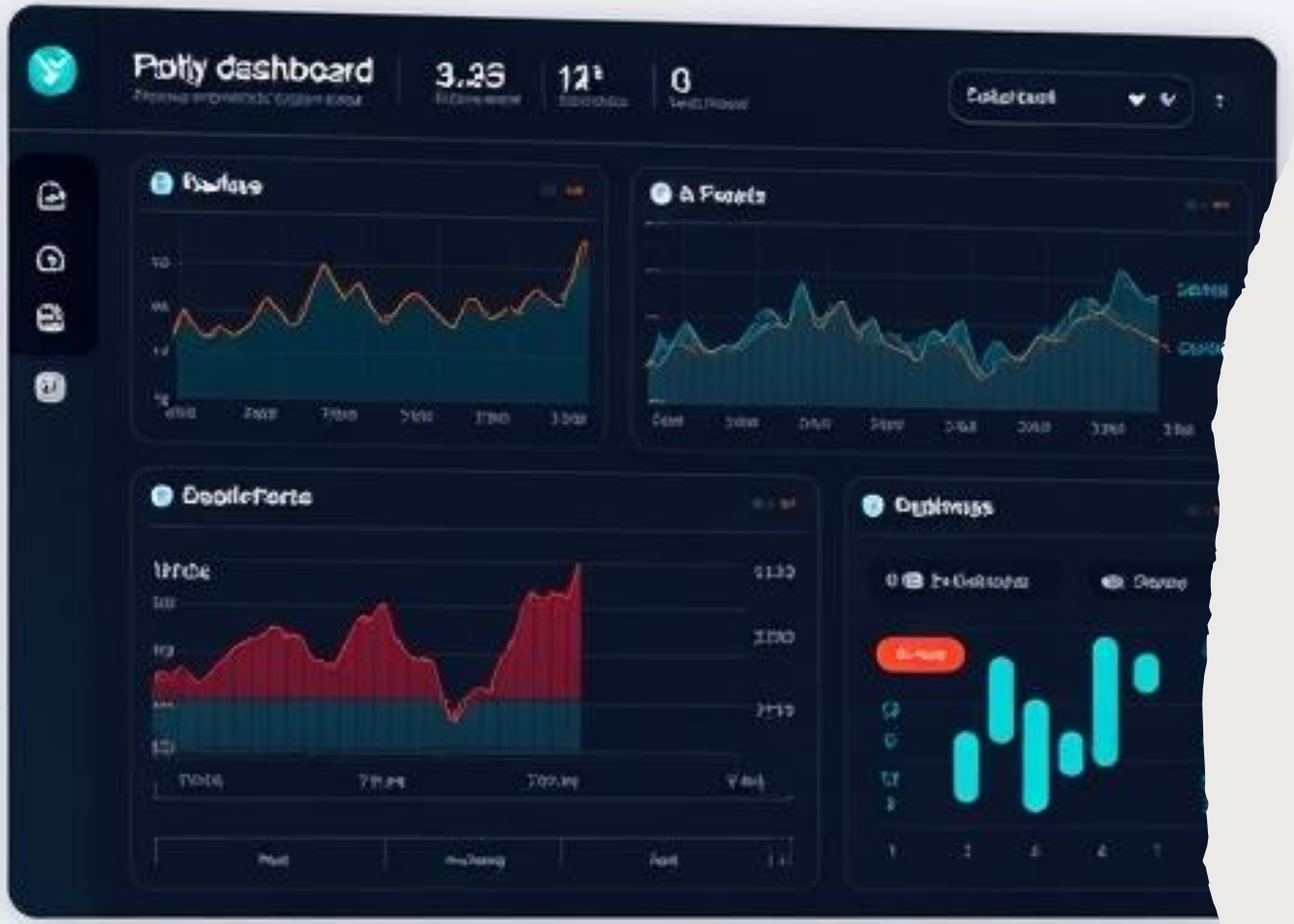
8. SQL Results

- **Data Querying:** "I used SQL to pull specific subsets of data for deeper analysis. For example, querying sales data by region helped identify geographical trends in customer behavior."
- **Key Query:** "Here's an example SQL query used to identify the sales trends in North America versus Europe."



. Interactive Map with Folium

- **Map Visualization:** "I created an interactive map using Folium to visualize the distribution of sales across different regions, helping to identify which areas had the highest sales growth."



10. Plotly Dash Dashboard

- **Dashboard Showcase:** "To provide an intuitive interface for decision-makers, I developed a Plotly Dash dashboard that allows users to interact with the sales data, view trends, and explore predictions in real-time."
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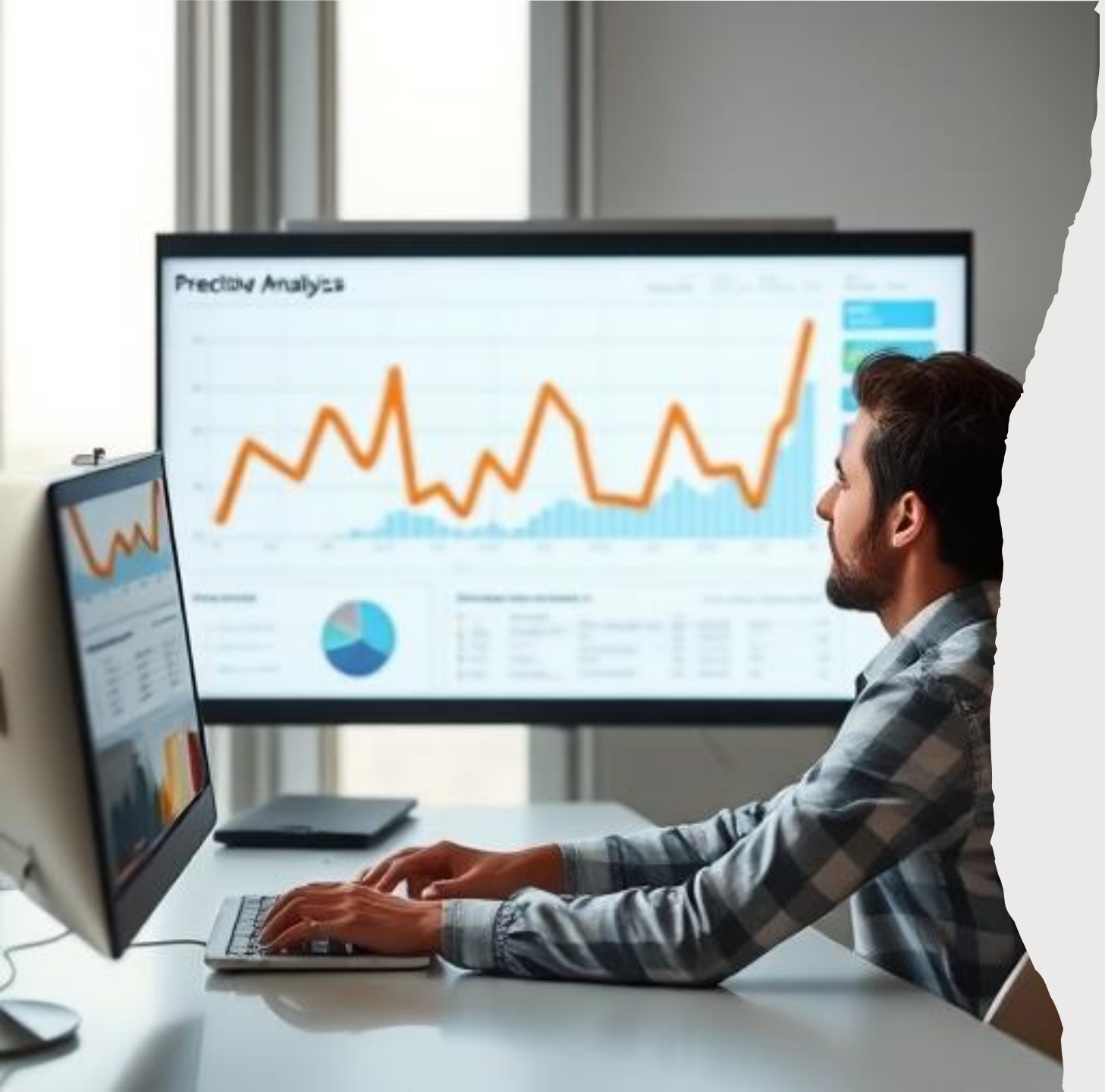
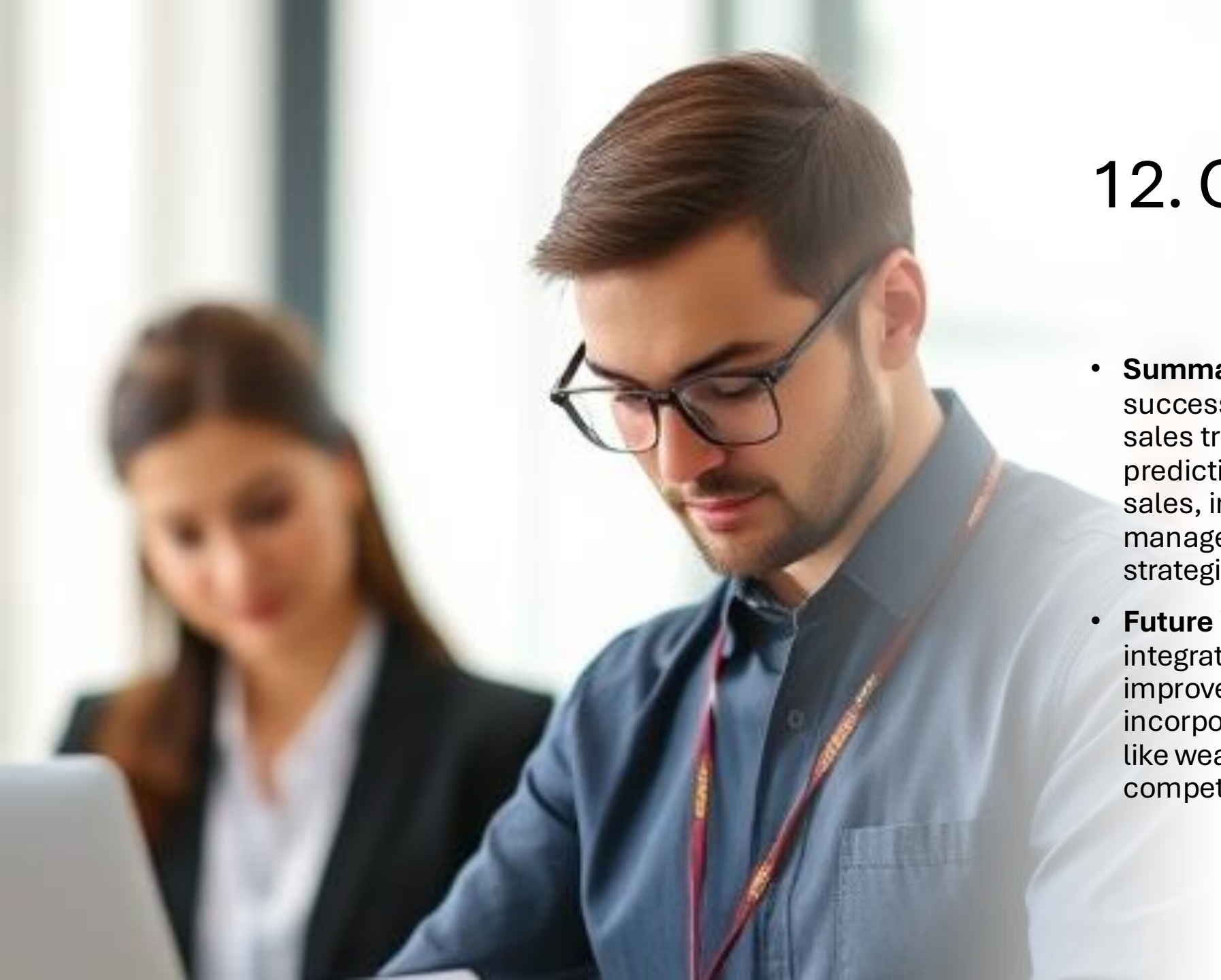


11. Predictive Analysis (Classification) Results

- **Model Results:** "The predictive model achieved an accuracy of 85% in forecasting sales for the upcoming quarter. This was validated by comparing predicted results with actual sales from the testing set."
- **Confusion Matrix:** "Here’s the confusion matrix for the model, showing how well it classified high and low sales events."



12. Conclusion

- **Summary of Findings:** "This project successfully identified key drivers of sales trends and provided a robust predictive model to forecast future sales, improving inventory management and marketing strategies."
- **Future Work:** "In the future, I plan to integrate real-time data feeds and improve the model's performance by incorporating additional variables like weather patterns and competitor pricing."

13. Creativity & Innovative Insights

- **Extra Touch:** "One of the innovative insights was discovering that sales were more responsive to discounts on certain product categories during holiday seasons. This information can help the business target promotions more effectively."

14. Q&A

- **Final Slide:** "Thank you for your attention. I'm happy to answer any questions you may have."

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