REAL-TIME SALES AND MARKETING DASHBOARD FOR A U.S.-BASED E-COMMERCE BRAND

1. Project Background

The client, an e-commerce company generating over \$8M in annual revenue, managed sales through Shopify, marketing via Meta Ads and Klaviyo, and inventory through Google Sheets. Their team struggled to get a unified view of business performance, often toggling across tools and missing time-sensitive opportunities.

They wanted an internal dashboard built in R Shiny that connected directly to data exports and APIs to track key metrics, visualize real-time performance, and help the team make faster, better-informed decisions. The dashboard needed to be browser-accessible within their intranet and updated multiple times a day.

2. Objectives

- Unify sales, marketing, and inventory data into one interactive dashboard.

- Provide campaign-wise ROI and ROAS tracking updated every 4 hours.

- Monitor low-stock alerts and sales performance by product category, SKU, and region.

- Enable account managers to track top customers and repeat purchase rates.

- Replace reliance on Excel for inventory checks and campaign reports.

3. Data & Integration

- **Sales Data**: Shopify export CSVs (via daily automated Dropbox sync).

- **Marketing Data**: Meta Ads & Klaviyo exports in CSV format (refreshed every 4 hours).

- **Inventory Data**: Google Sheets pulled via googlesheets4 API.

- **Customer Data**: Customer lifetime value and orders from Stripe export.

- **Preprocessing in R**:

  o Combined product-level sales with marketing spend and inventory position.

  o Mapped SKUs to campaigns and calculated net contribution margin per campaign.

  o Created customer segments (first-time, repeat, dormant).

4. Technology Stack

- **Frontend**: R Shiny with shinydashboardPlus, plotly, and reactable

- **Backend**: dplyr, lubridate, googlesheets4, readr

- **Visualization**: plotly for time-series and funnel views, highcharter for category-wise charts

- **Deployment**: Dockerized Shiny App hosted on AWS EC2 with cron jobs to update data

5. Key Features Implemented

5.1. Sales Overview Panel

- Daily, weekly, and MTD revenue

- Funnel: Site visits → Add to cart → Checkout → Purchase

- Comparison vs previous period and forecast

5.2. Campaign ROI Tracker

- Ad spend vs revenue per campaign

- Click-through rates, conversion rates, ROAS

- Customer acquisition cost (CAC) by channel

5.3. Inventory Status Panel

- SKU-wise current stock, reorder level, and alert threshold

- Moving average demand forecasting per SKU

- "Next 7-day depletion risk" dashboard

5.4. Customer Analytics

- Top 50 customers by LTV

- Purchase frequency and recency matrix

- Heatmap of purchases by U.S. states

5.5. Interactive Drilldowns

- Filters for date range, campaign, SKU, region

- Tooltips for unit economics breakdown per product

- Downloadable reports (PDF/Excel)

6. Results & Business Value

- Enabled **100% replacement** of Excel-based reporting within 2 weeks of launch.

- Detected overspending on two underperforming campaigns early, saving \\$6,400/month in ad waste.

- Helped optimize inventory replenishment cycles, reducing stockouts by **35%**.

- Reduced reporting turnaround time from **6 hours to less than 10 minutes**.

- Improved internal visibility and accountability for marketing and operations teams.

7. Challenges and Solutions

- **Challenge**: Shopify order data had inconsistent formatting due to historical changes. **Solution**: Created a robust ingestion function that standardized and reconciled records using SKU as the unique anchor.

- **Challenge**: Meta Ads export didn't directly map to Shopify conversions. **Solution**: Built attribution logic based on UTM parameters and temporal mapping using custom R functions.

- **Challenge**: Google Sheets rate limits caused latency in inventory updates. **Solution**: Implemented caching and asynchronous data pulls with failover logic to last successful pull.

8. Future Scope

- Integrate email campaign performance from Mailchimp and Postscript.

- Enable Slack-based alerts for low inventory or high-CAC anomalies.

- Add profit forecasting using ARIMA or Prophet models inside the dashboard.