

E-commerce Shopper Behaviour Dashboard

A comprehensive portfolio project demonstrating end-to-end data analytics: from cleaning 1 million user records through SQL in Python, to building an interactive Power BI dashboard that reveals actionable insights on conversion, returns, and customer engagement patterns.





ANALYTICS PROJECT

Project Scope & Dataset



Scale

1,000,000 unique users with 60 feature variables



Timeframe

Purchase dates spanning January 2025 to January 2027



Focus KPIs

Conversion, Returns, Session Time, Checkout Abandonment, Purchases, Spend



Deliverables

Cleaned dataset, SQL analysis notebook, interactive dashboard, insights presentation

Data Cleaning & Preparation

Rigorous data validation and transformation created a portfolio-ready dataset optimized for business intelligence analysis.

01

Type Standardization

Converted dates, numeric fields to proper formats and validated all ranges including rates and session durations

02

Missing Data Handling

Applied robust parsing methods for invalid dates and derived new Month field for time-series trend analysis

03

Identifier Validation

Verified user_id uniqueness per record, ensured categorical consistency across country and device_type dimensions

04

Feature Engineering

Created analysis-ready fields including month and age_band segments, confirmed no duplicate inflation in aggregations

KPI Performance Overview

1M

Total Users

Complete dataset analyzed

50.00

Avg Conversion Rate

Baseline performance metric

50.00

Avg Return Rate

Product satisfaction indicator

9.99

Weekly Purchases

Per user transaction frequency

60.01

Session Time (min)

Daily engagement duration

5.00

Monthly Abandonments

Checkout drop-off average

\$2,499

Monthly Spend

Average revenue per user

📄 These baseline metrics enable dimensional slicing by country, device type, and time period within the interactive dashboard

Monthly Trend Analysis

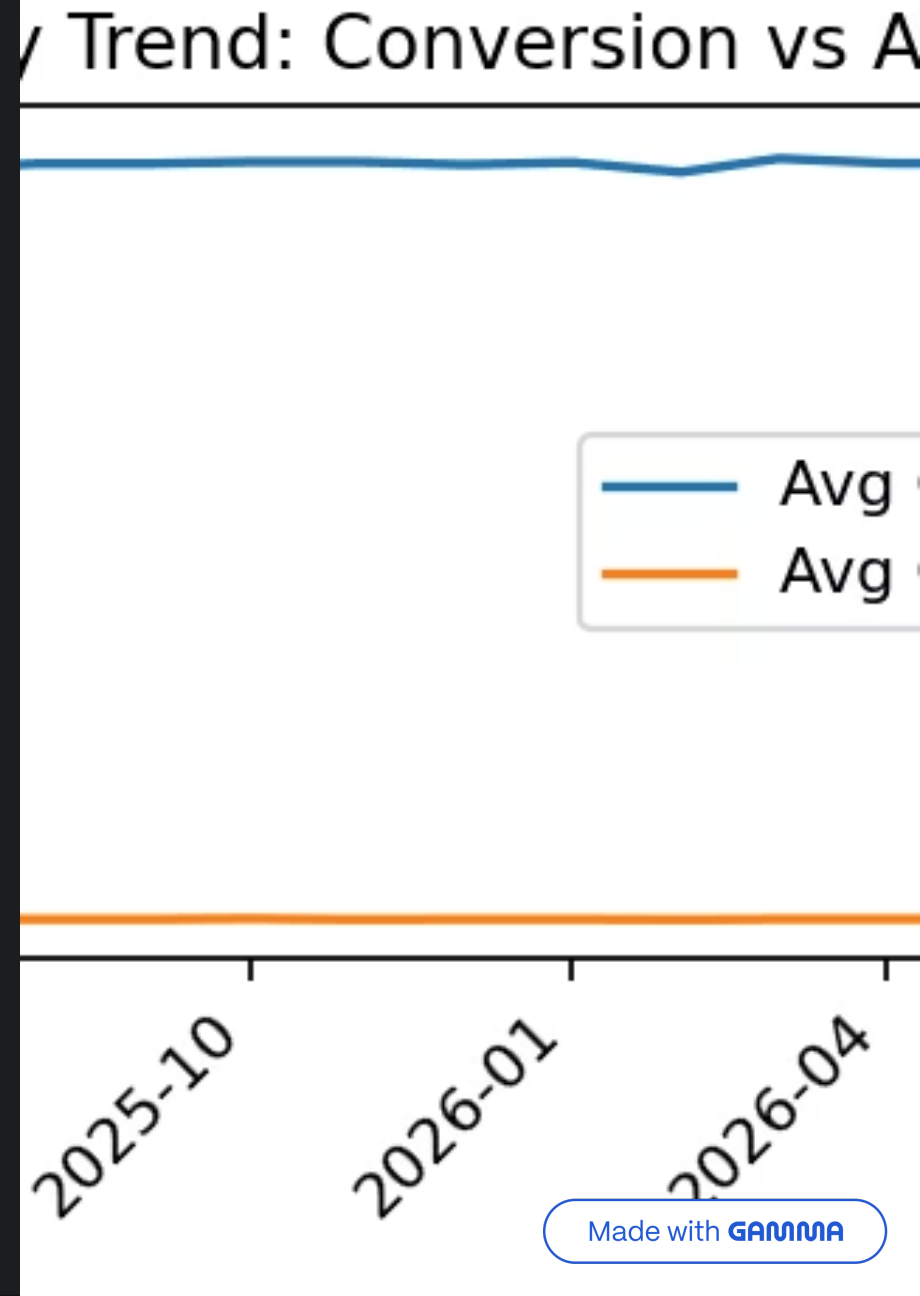
Conversion Rate vs Checkout Abandonment

Conversion Stability

Conversion rate maintains consistent performance around **50.04% across all months**, indicating reliable baseline behaviour with minimal seasonal variance.

Abandonment Patterns

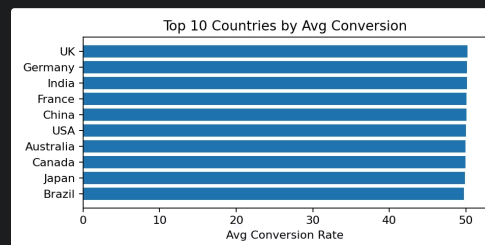
Checkout abandonments average 4.99 per month with no strong seasonality detected. Further segmentation by device and geography reveals actionable optimization opportunities.





Geographic Performance Leaders

Top Countries Ranked by Average Conversion Rate



Top Performer

UK leads at 50.21% conversion, representing the benchmark for optimization strategies

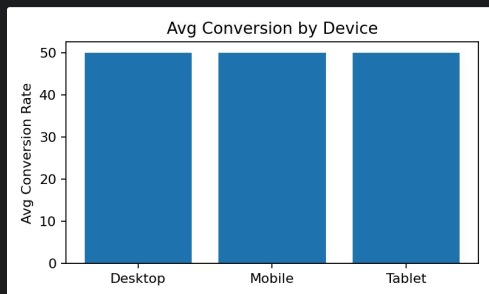
Regional Variation

Top 10 countries show minimal spread, with Brazil at 49.76% representing the lower bound

Dashboard Utility

Interactive Top N filter enables dynamic ranking analysis by any dimension

Dashboard Components



Segment Analysis: Device and age-band differences are relatively flat in aggregate, requiring filter combinations with spend and abandonment metrics to surface actionable insights.



KPI Cards

Six primary metrics: Users, Conversion, Returns, Session Time, Abandonments, and Purchases displayed prominently



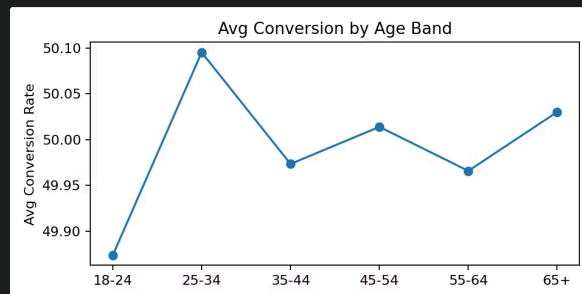
Geographic Ranking

Top 10 countries bar chart with dynamic Top N filter and descending sort functionality



Interactive Slicers

Dynamic filtering by month, country, and device type for granular segment exploration



Correlation Insights: Session time shows near-zero correlation (-0.0009) with conversion, indicating multivariate exploration is essential for optimization.



Trend Visualization

Monthly line chart comparing conversion rate against checkout abandonment patterns over time



Correlation Analysis

Session time vs conversion scatter plot with user_id granularity, color-coded by device type



Performance Optimized

Dashboard architecture balances interpretability with query performance for 1M+ records