Customer Behavior and Growth Performance Analysis

Executive Summary

This report presents the results of a data-driven analysis to understand and address the decline in revenue growth for an online retail business that continues to attract substantial traffic through both web and mobile channels. Despite the steady user acquisition, recent performance data indicates stagnating sales and a declining repeat purchase rate.

Three key questions guided this investigation:

- Are users failing to complete purchases due to conversion inefficiencies?
- Are users failing to return, indicating a retention problem?
- Or has the customer mix shifted toward lower-value users?

To investigate these issues, three analytical methods were applied: Cohort Analysis, Funnel Analysis, and RFM Segmentation. All analyses were performed using Python, SQL, and Tableau..

Findings reveal that customer engagement drops sharply after the first month of acquisition. Average Month 0 retention stands at 39.25%, showing that most new users do not make a purchase within their first month. Funnel analysis highlights significant drop-offs between the *Add to Cart* and *Booking* stages, hinting at purchase hesitation or checkout problems. Although mobile traffic accounts for approximately 90% of sessions, conversion rates remain nearly identical to web, implying that the mobile experience is not fully optimized.

RFM segmentation further clarifies the customer value imbalance. High-value users (Champions and Big Spenders) represent only around 20% of the user base but contribute to the majority of revenue. In contrast, over half of the customers fall into low-value groups such as “Occasional” and “Lost.” This skew indicates that new acquisitions are not converting into loyal, profitable customers — Limiting long-term growth potential.

In summary, while the business successfully attracts new visitors, it struggles to retain and convert them effectively. The combination of low repeat purchase rates, checkout inefficiencies, and a growing share of lower-value users has led to revenue stagnation.

Key Recommendations:

- **Enhance early user retention**: Introduce personalized engagement and purchase incentives during the first 30 days.
- **Optimize the funnel**: Simplify checkout flows and strengthen trust and clarity at key drop-off stages.
- **Re-engage lost users**: Use targeted offers to encourage "At Risk" and "Lost" customers to shop with us again.

Project Background

The company operates an online retail platform serving both web and mobile users. Over the past year, the platform attracted significant traffic — approximately 93K Web sessions and 838K Mobile sessions — but experienced slower revenue growth. This project is aimed to identify where in the customer journey users disengage or fail to convert and evaluate the relative value of customer segments.

Approach

Three main analytical methods were used to investigate the problem:

1. Cohort Analysis – tracked monthly customer retention rate over the past year with new users.

2. Funnel Analysis – measured user progression across key purchase stages to identify drop-offs and compare mobile vs web behavior.

3. RFM Segmentation – categorized users by recency, frequency, and monetary value to highlight high- and low-value groups.

1. Retention and Monthly Cohort Analysis

Overview

The cohort table tracks users who joined within the past year and their purchasing activity month by month. Month 0 indicates the percentage of users who made a purchase within the same month they joined.

Across all cohorts, **Month 0 retention averages 39.25%**, indicating that more than **60%** of new users who joined didn't purchase within the same month they joined.

Key Observations

- Initial Engagement Decline:
  Earlier cohorts (Aug–Nov 2021) had strong Month 0 engagement around 44–47%. However, cohorts from December 2021 (21.79%) and May 2022 (16.36%) show unusually low Month 0 retention, indicating weak initial engagement and fewer users returning in later months. This suggests either less-engaged customers are being attracted, or the onboarding process is no longer as effective at converting them.
- Early Drop-Off After 2–3 Months:
  Across all cohorts, retention falls below 25% by Month 3–4. Indicating users are engaging briefly, but then failing to return.
- Flattened Long-Term Retention Curve:
  Even the best-performing cohorts (August–November 2021) plateau after the 4th or 5th month. Ultimately, users are not convinced enough to make a repeat purchase.

Interpretation

The website continues to attract new visitors, but they are **not developing into repeat customers**. The rapid early drop-off suggests:

- The first experience isn't compelling enough to make them return.
- Users don't perceive ongoing value, or
- Marketing is too focused on attracting new users and is less focused on keeping them.

This makes the revenue unstable. Customers are constantly being replaced instead of building a consistent and loyal base, which is unsustainable.

2. Funnel Conversion Analysis

Overview

The funnel data compares the step-by-step user journey from homepage to booking, segmented by **mobile** and **web** traffic.

Funnel Stage	Mobile (%)	Web (%)
1. Homepage → Scroll	70.38	70.40
2. Scroll → Add to Cart	68.38	69.32
3. Add to Cart → Item Detail	53.74	53.58
4. Item Detail → Booking	32.32	32.61

Key Observations

- Mobile dominates traffic (about 90% of all sessions), yet conversion rates are nearly identical to web, suggesting mobile UX may not be optimized for its much larger audience.
- The largest drop-off occurs after Add to Cart, as many users revisit Item Detail pages. This indicates purchase hesitation or checkout confusion.
- Despite strong early engagement (Scroll and Add to Cart stages), only about one-third of sessions reach a booking.

Path Analysis Examples

Typical user journeys show multiple back-and-forth behaviors:

- **Example 1**: Homepage → Scroll → Add_to_Cart → Promo_Page → Item_Detail → Clicks → Booking
- **Example 2**: Homepage → Add_to_Cart → Search → Item_Detail → Scroll → Booking

Such looping patterns suggest users are **re-evaluating their purchase decision** mid-funnel, possibly due to:

- Incomplete or confusing product information,
- Lack of trust or price clarity at checkout,
- Missing reassurances (slow delivery, returns, payment security).

Interpretation

The problem isn't attracting users—it's converting them. Most people engage with the app, but too many drop off right before they complete a purchase. Since most of our traffic is on mobile, even small usability issues at this critical point have a major impact on the revenue.

3. RFM Customer Segmentation

Overview

Customer segmentation is based on all users who have made a purchase during the last year.

RFM analysis classifies customers based on:

- **Recency** (how recently they purchased),
- **Frequency** (how often they purchase), and
- **Monetary value** (how much they spend).

Segment	Users	Avg.Recency	Avg.Frequency	Avg.Monetary $
Big Spenders	1,886	17.1	40.0	1,505.27
Champions	5,718	15.4	17.6	544.52
Loyal	2,085	38.6	14.2	438.74
Frequent	3,730	36.5	7.9	259.07
Promising	2,771	53.7	6.3	246.76
Occasional	11,439	104.9	2.9	104.08
Lost	8,969	225.3	1.3	22.10
At Risk	689	74.6	5.6	120.06
One-Time Buyers	435	15.9	1.4	29.87

Key Observations

- High-value segments (Big Spenders + Champions) represent only ~20% of users but generate a disproportionate share of revenue.
- Low-value groups ("Occasional" and "Lost") dominate, together making up over 54% of the customer base.
- "At Risk" customers (689) represent an opportunity — they were once engaged but are on the verge of churn.

Interpretation

Revenue growth is limited because **the customer base has shifted towards low-value, infrequent buyers.**

There is a struggle to turn new users into loyal,high value customers.

Loyal, profitable customers are a minority, and **many previously active users have lapsed**.

This structure explains why revenue growth has slowed even with steady site traffic — new visitors are less expensive to acquire, but they also generate significantly less revenue over time.

Conclusion:

Revenue slowdown is not caused by a lack of traffic, but rather by **poor conversion efficiency and weak customer retention**. The issue lies **beyond acquisition — in retaining and monetizing those visitors effectively.**

Recommendations

1. **Boost Early Retention:**
   Engage new users within their first 30 days through personalized offers, onboarding incentives, and tailored product recommendations to encourage initial purchases.
2. **Optimize the Checkout Funnel:**
   Simplify the checkout process, improve price and delivery transparency to reduce hesitation at the "Add to Cart" stage. Prioritize mobile UX improvements to match its majority traffic share.
3. **Re-Engage Dormant Users:**
   Target "At Risk" and "Lost" segments with personalized campaigns and limited-time offers to recover fading customers and strengthen retention.
4. **Reward Loyalty and Value:**
   Introduce loyalty incentives and exclusive benefits for frequent buyers and high spenders to increase purchase frequency and lifetime value.