Customer Lifecycle & Revenue Analytics - Project Report

Project Objective

The objective of this project was to analyze customer retention, purchasing behavior, cohort performance, and lifetime revenue dynamics for an e-commerce business. The analysis focuses on identifying when customers churn, how value accumulates over time, and which points in the lifecycle drive the highest economic impact, with the goal of informing growth, retention, and monetization strategy.

Scope of Work

This project covers the full analytics lifecycle:

- Data cleaning and preprocessing of transaction data
- Customer-level cohort modeling and lifecycle segmentation
- Retention and survival-retention analysis across time periods
- Revenue cohort and cumulative Lifetime Value (LTV) modeling
- Dashboard design for business stakeholders
- Executive-level insights and actionable recommendations

All analysis was performed in Python (Jupyter Notebook) and visualized in Power BI.

Key Insights

1) Retention Behavior

- Customer churn is **heavily front-loaded**, with the majority of drop-off occurring within the **first 1–3 months**
- Retention stabilizes after Month-3 at approximately **18–22 percent**, indicating a consistent survival threshold
- Customers who remain active beyond Month-3 demonstrate **significantly higher repeat-purchase likelihood and value**
- Cohort-to-cohort performance varies, suggesting differences in **acquisition quality, onboarding experience, or customer intent**

Implication: Retention is primarily an **early-lifecycle problem**, not a late-stage engagement problem.

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2) Revenue & Lifetime Value Dynamics

- Revenue is **concentrated in the first 2–3 months** of a customer's lifecycle
- The cumulative LTV curve **flattens sharply after Month-3**, with diminishing incremental revenue beyond early periods
- High-performing cohorts drive stronger **early-period economic contribution**
- Late-period monetization impact is **minimal** relative to early activation and repeat purchasing

Implication: The greatest financial leverage lies in **accelerating early value realization**, not stretching long-tail monetization.

3) Customer Value Concentration

- A small portion of customers contributes a **disproportionate share of total revenue**
- Repeat-purchase customers deliver **multiple-times higher lifetime value** than single-purchase customers
- The first-purchase and onboarding experience strongly influences **future retention trajectory**
- Low-value cohorts churn early and rarely recover later in their lifecycle

Implication: Economic outcomes are driven by **customer quality and early-stage experience** rather than duration alone.

Strategic Recommendations

Short-Term Growth Priorities (Next 60–90 Days)

1. Focus retention and lifecycle effort on the **first 30–60 days after acquisition**
2. Implement **second-purchase activation programs** (nudges, replenishment reminders, early-cycle incentives)
3. Run **targeted win-back journeys** between Month-1 and Month-2, when recovery probability is highest
4. Strengthen onboarding and first-purchase experience for **underperforming cohorts**
5. Monitor **cohort-level Retention and LTV as core operating KPIs**

Business Impact of Findings

This analysis shifts the organization's retention strategy from "extending customer lifespan" to **improving early-lifecycle performance**, where both churn risk and revenue concentration are highest. Optimizing the first 60-day window is expected to deliver greater ROI than late-stage engagement initiatives, while also improving cohort quality and long-term unit economics.

Deliverables Included

- End-to-end data cleaning and analytics pipeline (Jupyter Notebook)
- Power BI dashboard covering retention, cohorts, and LTV
- Cohort retention, survival retention, and revenue cohort datasets
- Executive insights briefing and strategic recommendations

Next Analytical Opportunities (Future Work)

- Channel-wise or acquisition-source cohort comparison
- Product-level or category-level retention and LTV segmentation
- Customer lifetime profitability analysis instead of revenue-only
- Experiment design for **second-purchase uplift programs**

These extensions would provide deeper decision support for marketing, growth, and product teams.