Case Studies & Guesstimates for E-Commerce Industries

Part - II

Guesstimate Questions

Question 1.What will be the total annual revenue generated from furniture rentals in 2025?

Tier	Cities	Population per City
Tier 1	Bengaluru, Mumbai, Delhi, Hyderabad, Chennai	10,000,000
Tier 2	Pune, Gurugram, Noida, Ghaziabad, Faridabad, Jaipur	5,000,000
Others	Mysuru, Chandigarh, Vijayawada, Nashik	2,000,000

Step	Details	Calculation
Population Estimation	Total population in Tier 1, Tier 2, and Tier 3 cities	Tier 1: 50M, Tier 2: 30M, Tier 3: 8M Grand Total = 88M
Internet Penetration	Percentage of population with internet access	Tier 1: 50M * 80% = 40M Tier 2: 30M * 60% = 18M Tier 3: 8M * 40% = 3.2M Total = 61.2M
Awareness of Furlenco	Assume 20% of internet-penetrated population aware of Furlenco	Awareness = 61.2M * 20% = 12.24M
People Using Furlenco	Assume 2% of aware population use Furlenco	Users = 12.24M * 2% = 0.2448M (244,800 users)
Average Renting Revenue	Estimated annual revenue per user	Rs 7,500 per user
Total Revenue from Sales	Total renting revenue from Furlenco users	Rs 7,500 * 244,800 = Rs 183.6 crore

Question 2: What will be Furlenco's expected total annual expenditure in 2025?

Category	Percentage of Total Expenses	FY25 Projected Cost (Rs crore)	Remarks
Inventory Costs	35%	Rs 98.23	Sourcing, refurbishment, and maintenance costs.
Logistics	15%	Rs 42.10	Warehousing, delivery, and reverse logistics.
Marketing	15%	Rs 42.10	Increased focus on digital and offline campaigns for brand awareness.
Technology	15%	Rs 42.10	Platform upgrades, AI tools, and cybersecurity measures.
Employee Salaries	5%	Rs 14.03	Reduced focus on salaries (operations, support, and tech staff).
Insurance	5%	Rs 14.03	Coverage for damages, theft, and customer incidents.
Partnership Costs	10%	Rs 28.07	Payments to real estate agents and promotional platforms.
Total	100%	Rs 280.66 crore	Total Expenditure

Projected Revenue: Rs 183 crore
Target Loss: Rs 97.66 crore
Total Expenditure: Rs 280.66 crore

Q3. What will be the distribution of market share between online and offline furniture rental companies in India over the next five years?

The online furniture market is expected to grow at an annual rate of about 10.0% to 11.1% from 2023 to 2028.
The offline furniture market is expected to grow at a slower rate of 3.4% to 4.0% annually during the same period.

Year	Online Share (%)	Annual Growth Rate (Online)	Offline Share (%)	Annual Growth Rate (Offline)
2023	47.50%	-	52.50%	-
2024	49.00%	11.10%	51.00%	4.00%
2025	50.70%	11.00%	49.30%	3.80%
2026	52.10%	10.00%	47.90%	3.70%
2027	53.50%	9.80%	46.50%	3.60%
2028	55.00%	8.90%	45.00%	3.40%

4.What is the estimated increase in the number of e-commerce websites in the next three years?

Year	Annual Growth Rate (%)	Market Size (in $ Billion)	Estimated Total E-Commerce Websites (in Thousands)	Annual Growth Rate of Websites (%)	Increase in Number of Websites (in Thousands)
2024	19%	$70 Billion	600	20%	100
2025	19%	$83 Billion	720	20%	120
2026	19%	$99 Billion	864	20%	144

Annual Growth Rate: The **annual growth rate** of the e-commerce market is projected at **19%** each year

Increase in E-Commerce Websites: The number of active e-commerce websites is expected to grow by **20%** annually

Q 5. How much will global e-commerce sales grow annually over the next five years?

Global Growth Projections:

Projected Sales: The total global e-commerce sales are expected to increase steadily, from **$6.09 trillion in 2024** to **$8.09 trillion in 2028**, with annual increases in the range of **$0.47 trillion to $0.52 trillion**.

Growth Rate: Global e-commerce is expected to grow at an average annual growth rate (CAGR) of **7.6%** from 2022 to 2028, with year-on-year fluctuations due to market maturity in different regions, new market entrants, and shifts in consumer behavior.

Year	Global E-Commerce Sales (in Trillions USD)	Annual Growth Rate (%)	Estimated Growth in Sales (in Trillions USD)
2024	6.09	8.40%	0.47
2025	6.56	7.80%	0.47
2026	7.06	7.50%	0.5
2027	7.57	7.20%	0.51
2028	8.09	6.90%	0.52

Global Ecommerce Sales:

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Part - III

Cohort Analytics

Fundamental of Analysis

Categorization of Cohorts for Furlenco

In order to analyze customer behavior, retention, and lifetime value, Furlenco can categorize cohorts based on the following factors:

1. Cohort by Month

- Description: Cohorts can be grouped based on the month or quarter when customers signed up or made their first purchase.
- Purpose: This allows Furlenco to track how customer behavior evolves over time. For example, are customers from certain months more likely to churn? What is the retention rate for users who signed up in a specific month or quarter?
- Analysis Focus: Cohort analysis, churn rate, retention rate, lifetime value (LTV) over time.

2. Cohort by Age

- Description: Grouping customers based on their age or age ranges (e.g., 18-24, 25-34, 35-44, etc.).
- Purpose: Age demographics can play a significant role in product preferences. Younger customers might prefer more affordable or trendy furniture, while older customers may focus more on durability and quality.
- Analysis Focus: Product preferences, average order value (AOV), churn by age group, customer lifetime value (CLTV) by age.

3. Cohort by Demographics

- Description: Demographics can include various factors such as gender, location (city or region), education level, family status (e.g., single, married, with children), etc.
- Purpose: This categorization helps Furlenco understand how different customer groups behave. For example, urban customers might have different rental patterns compared to rural customers, or single customers might rent smaller items compared to families.
- Analysis Focus: Customer preferences, rental frequency, average order value, churn, customer satisfaction by demographic group.

4. Cohort by Income

- Description: Categorizing customers based on income levels, such as low, middle, and high income, or by specific income ranges.
- Purpose: Income influences customers' purchasing power, affecting the type of furniture they rent. Higher-income customers may opt for more premium products, while lower-income customers may prioritize affordability.
- Analysis Focus: Product preferences by income, average order value, customer lifetime value, churn rate based on income brackets, pricing strategy.

5. Cohort by Plan Type

- Description: Grouping customers based on the subscription or rental plan they choose. Furlenco could have various plans such as short-term rentals, long-term rentals, or subscription-based rentals.
- Purpose: This helps analyze customer retention based on the type of plan they choose, and whether customers who opt for longer-term rentals tend to stay longer.
- Analysis Focus: Retention rate, churn by plan type, average revenue per customer (ARPC), product preferences by plan type, customer satisfaction by plan.

After categorizing the cohorts, the next step is to summarize the metrics. Summarizing involves calculating key statistics that describe the data succinctly.

Key Metrics:

- **Mean**: The average value of a dataset.
- **Median**: The middle value in a dataset when ordered.
- **Standard Deviation**: A measure of the amount of variation or dispersion in a set of values.
- **Count**: The number of observations in a dataset.

Example:

- Category: Average Total Order Value
    - Mean Transaction Value: 32900

- Median Transaction Value: 17697
- Standard Deviation: 43245
- Count: 3000 transactions

3. Comparison

The final step is to compare the summarized metrics across different cohorts. Comparisons can be done in various ways to highlight differences and similarities.

Methods of Comparison:

- **By Percentage**: Compare metrics as percentages to provide a relative measure of difference.
  -
- **By Using Symbols**: Use symbols to denote changes and differences, making the comparison visually intuitive.
  - ↑ (Increase)
  - ↓ (Decrease)
  - ↔ (No change)

Example Comparison Table:

Metric	UNLMTD Essentials	UNLMTD Lite	UNLMTD Luxury	Comparison
Mean Transaction Value	20165	31217	38821	UNLMTD Luxury ↑ 24 %
Median Transaction Value	20994	31794	41394	UNLMTD Luxury ↑ 30%
Standard Deviation	14750	21947	29148	UNLMTD Luxury ↑ 32%
Count	376	349	413	UNLMTD Luxury ↑ 18%
Total Amount	7582333	10894744	16033276	UNLMTD Luxury ↑ 47%

Cohort Analysis is the process of grouping customers based on shared characteristics or behaviors within a specific time period and analyzing their actions over time. For example, customers who sign up in the same month or who have similar demographics can be grouped into cohorts to track their behavior, retention, and lifetime value.

Why it's needed for Furlenco:

- Customer Retention: Helps Furlenco identify patterns in customer behavior over time, improving retention strategies.
- Personalized Marketing: Enables targeted marketing based on cohort characteristics, enhancing customer engagement.

- Churn Reduction: Identifying high-churn cohorts allows Furlenco to address issues before customers leave.
- Optimized Product Strategy: Insights from cohorts help Furlenco understand which products or services work best for specific customer segments.

Importance of Cohort Analysis

1. **Behavioral Insights**: It helps in understanding how different groups of users behave over time, revealing patterns in user behaviour that may not be visible through aggregate data.
2. **Retention Analysis**: Businesses can track how long users stay active after their first interaction, which is crucial for identifying retention and churn rates.
3. **Performance Tracking**: It aids in measuring the effectiveness of changes in products, services, or marketing strategies by comparing cohorts before and after the change.
4. **Personalised Strategies**: Insights from cohort analysis can inform targeted marketing strategies and personalised user experiences.

Cohort Analysis Metrics with Example

General Overview		**Example: Furlenco**	
Step	**Details**	**Metric**	**Details**
Define Cohorts	Group users based on the month they made their first purchase.	**Purchase Frequency**	Track how often users from each cohort make a purchase over the next months.
Track Metrics	Monitor key metrics like purchase frequency, order value, and retention rate for each cohort over subsequent months.	**Average Order Value**	Measure the average value of orders for each cohort over the same period.
Analyze Data	Compare the performance of different cohorts to identify trends and patterns.	**Retention Rate**	Calculate the percentage of users from each cohort who continue to make purchases month after month.

Example - Let's take a hypothetical example of Furlenco and illustrate it in a tabular format based on the flowchart steps:

Step 1: Data Collection

We have created a hypothetical dataset of 3000 samples.

Step 2: Define Cohorts:

Cohort	Cohort Start Date	Cohort End Date
Jan 2023	2023-01-01	2023-01-31
Feb 2023	2023-02-01	2023-01-28
Mar 2023	2023-03-01	2023-03-31
Apr 2023	2023-04-01	2023-04-30
May 2023	2023-05-01	2023-05-31
Jun 2023	2023-06-01	2023-06-30
Jul 2023	2023-07-01	2023-07-31
Aug 2023	2023-08-01	2023-08-31
Sep 2023	2023-09-01	2023-09-30
Oct 2023	2023-10-01	2023-10-31
Nov 2023	2023-11-01	2023-11-30
Dec 2023	2023-12-01	2023-12-31

Step 3: Track Metrics

Metric	**Jan 2024 Cohort**	**Feb 2024 Cohort**	**Mar 2024 Cohort**
Number of Users	22	50	111
Repeat Purchases	11	21	68
Total Order Value	38046	26276	28023
Retention Rate	50%	44%	53%
Churn Rate	50%	56%	46%

Step 4: Analyse Patterns

Pattern	Jan 2024 Cohort	Feb 2024 Cohort	Mar 2024 Cohort
Average Order Value	38046	26276	28023
Average rent duration	5	4	5
Retention After First Month	50%	44%	53%

Step 5: Actionable Insights

Insight	Action
Targeted Marketing	Tailor campaigns to customer cohorts based on demographics and preferences.
Retention Strategies	Identify at-risk cohorts and implement personalized retention efforts
Pricing Optimization	Adjust pricing based on cohort income and plan type to maximize conversions.
Enhanced Customer Experience	Offer personalized product recommendations based on customer demographics.
Product Strategy	Focus on high-demand products for specific cohorts to improve inventory management.
Increase CLTV	Enhance customer lifetime value by offering long-term rental options to profitable cohorts.

Summary Table

Process Step	Details
Data Collection	Created a synthetic data containing UserID, Customer_Age, Subscription Plan, Subscription Status,Subscription Duration (Months), Churned Status, Total Order Value,Product Categories, Number of Items, Product IDs, Product Names,Signup Date, First Order Date, Last Order Date, Cohort Month, Lifetime Value, Transaction ID for analysis.
Define Cohorts	Grouped users into cohorts based on their first purchase month (Jan, Feb, Mar ,Apr,May,Jun,Jul,Aug,Sep,Oct,Nov,Dec 2023).
Track Metrics	Tracked number of users, initial order value, Churn Rate, total order value,Lifetime Value and retention rate for each cohort.
Analyze Patterns	Analysed average order value,Churn Rate, retention rate, and order value trends for each cohort.
Actionable Insights	Derived insights on retention rates, order value stability, and purchase frequency to inform strategic actions.

Conclusion of Cohort Analysis:

Cohort analysis is a powerful tool that allows businesses to segment customers based on shared characteristics or behaviors over time. For companies like Furlenco, it provides valuable insights into customer retention, preferences, and product performance. By identifying patterns within different cohorts (e.g., by age, plan type, or sign-up month), businesses can personalize marketing, optimize pricing, improve customer experiences, and reduce churn. This leads to more targeted strategies that enhance customer loyalty, increase lifetime value, and ultimately drive business growth. Cohort analysis is essential for making data-driven decisions and refining business strategies for better long-term outcomes.

The simple analysis can be done in Python as shown **here.**

A/B Testing

Objective:

To determine which free trial length 7 days or 14 days leads to higher sign-up rates and customer engagement.

Null Hypothesis:

- 7-day trial: Shorter trial periods might create urgency, pushing users to sign up faster.

Alternate Hypothesis:

- 14-day trial: Longer trial periods might attract more users as it reduces their perceived risk.

Test Setup:

1. Target Audience:

Select a random sample of users visiting the website/app.

Split the audience into two groups:

- Group A: Offered a 7-day free trial.
- Group B: Offered a 14-day free trial.

2. Variations:

- Group A (Control): Current default 7-day free trial offer.
- Group B (Variation): Introduce a 14-day free trial banner.

3. Placement:

- Update banners, landing pages, and popups on the website and app.
- Reflect the trial duration during the signup process.

4.Data Collection:

Created synthetic data for 1000 samples for each version (Group A and Group B), tracking the number of completed purchases for each version over a set period.

5. Metrics to Measure:

- Primary Metric: Sign-up Conversion Rate (number of sign-ups/total visitors).
- Secondary Metrics:
    - Engagement Rate during the trial (e.g., browsing, renting products).
    - Conversion to paid users after the trial period.
    - Retention Rate (percentage of customers staying after the first rental cycle).

6.Analysis:

- Compared the sign-up conversion rates between the two groups (7-day vs. 14-day trial).
- Performed statistical analysis (such as Chi-Square Test) to check if the difference in conversion rates is significant and got p-value of 0.0129
- Evaluated the engagement rates to assess if a longer trial increases user interaction.
- Measured retention and conversion to paid users for further insights into the long-term impact of the trial period.

7.Conclusion:

- Since the p-value is less than the threshold of `0.05`, we reject the null hypothesis.
- Based on the conversion rates, engagement, and retention data, determine whether the 7-day trial or the 14-day trial results in higher customer engagement and conversions.
- The 14-day trial should be adopted as the default trial duration across the platform to improve user acquisition, engagement, and paid conversions.

Summary:

Group	Total Users	Signed Up Users	Paid Conversions	Sign Up Rate (%)	Conversion Rate (%)	Overall Conversion Rate (%)
A	**1000**	**243**	**69**	**24.3%**	**28.4%**	**6.9%**
B	**1000**	**299**	**101**	**29.9%**	**33.78%**	**10.1%**

Statistical Significance: The Chi-Square test p-value of 0.0129 confirms that the difference in conversion rates is not due to chance.

Result: The 14-day trial results in higher customer engagement and conversions.

The simple analysis can be done in Python as shown **here.**

Conversion Rate Optimization (CRO)

Steps for CRO Based on A/B Testing Results

Analyze Current Performance
From the results:

- Group A (7-day trial): Overall Conversion Rate = 6.9%
- Group B (14-day trial): Overall Conversion Rate = 10.1%
- Group B outperforms Group A in terms of sign-ups, paid conversions, and overall conversion rates.

Identify Factors Contributing to Higher Performance in Group B

- Longer trial period (14 days) reduces perceived risk and allows users more time to experience the platform.
- Potentially more attractive messaging or placement of banners related to the 14-day trial.

Run Funnel Analysis:

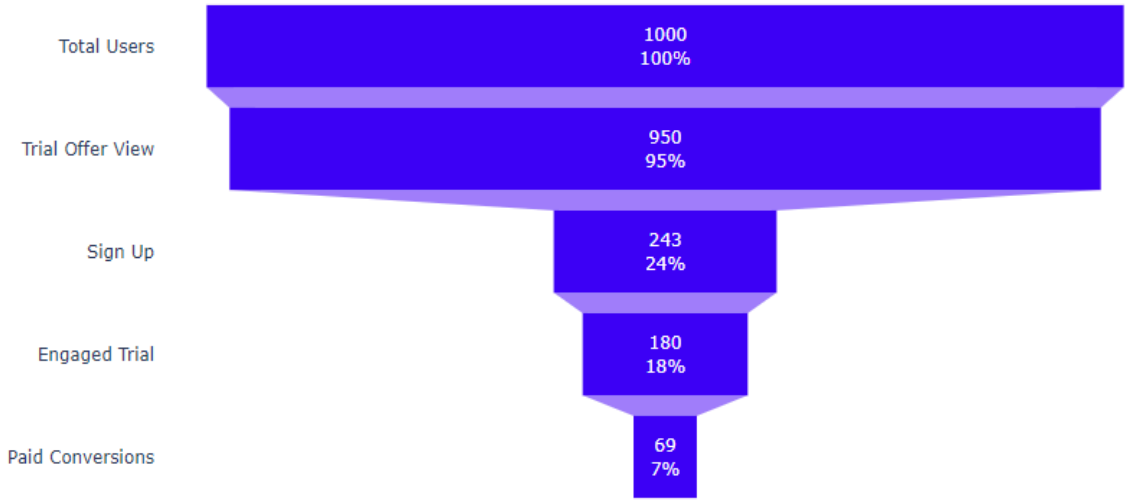
Funnel analysis can help identify at which stages users drop off:

- Visitor → Trial Offer View
- Trial Offer View →Sign-Up
- Sign-Up → Engaged Trial
- Engaged Trial→ Paid Conversion
- Paid Conversion → Retained Customer

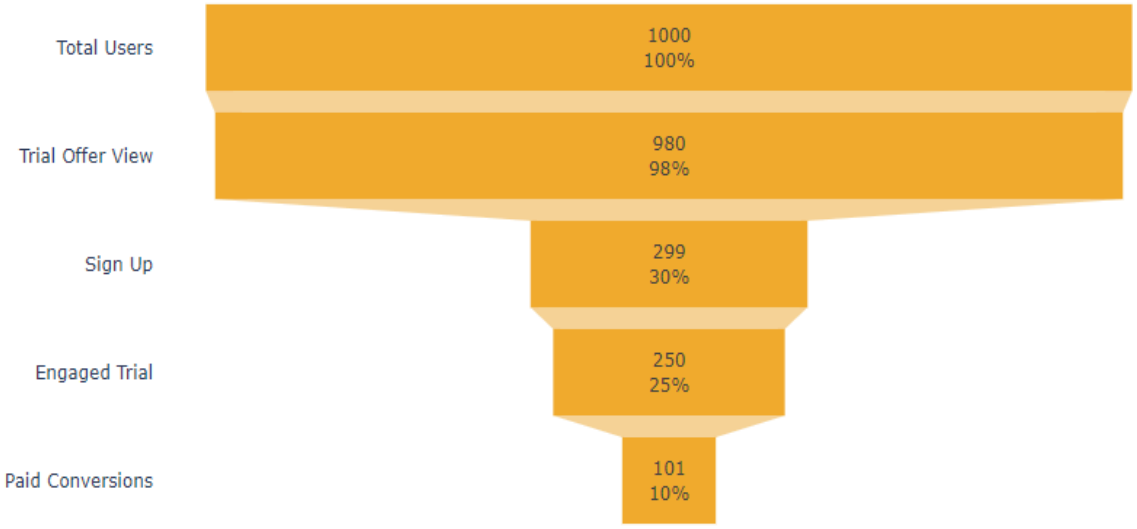
Focus on metrics like:

- Drop-off rates between stages.
- Engagement during the trial period for both groups.

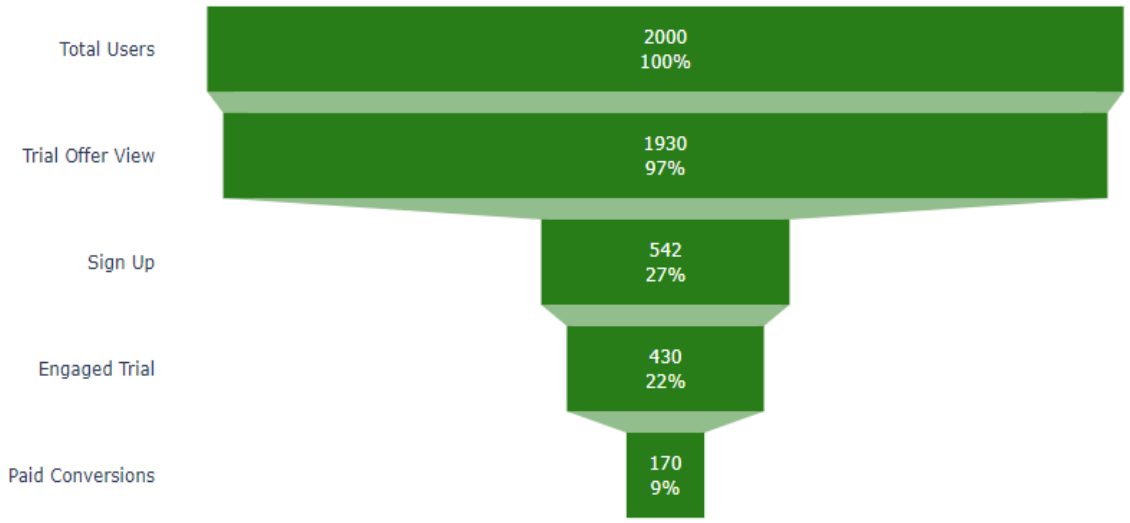
Group A Funnel



Group B Funnel



Group A and B combined Funnel



Recommendations:

Refine Messaging and Engagement

- Emphasize the benefits of the trial (e.g., "Enjoy 14 days of exploring premium rentals for free").
- Send personalized email reminders during the trial period to improve engagement.

Optimize for Retention Post-Trial

- Provide offers or discounts to convert trial users to paid subscriptions.
- Offer onboarding guides or customer success assistance.

Conduct Further Testing
Based on the results, new experiments can focus on:

- Optimizing messaging for the trial duration.
- Testing additional variables, such as pricing tiers or exclusive trial perks.