

Product Analytics

Product Management

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Core steps in Product Analytics

Steps	Actions
Data Tracking	Capturing different data like visits, events, purchases, etc.
Data Analysis	Deriving insights from this data through visualization via dashboards or by using tools such as Excel or SQL
Data-Driven Decision Making	Making decisions based on your analysis of the data captured

Components of Product Analytics

Terminology	Explanation	Example
Data Point	Individual piece of information collected for your business.	Revenue per day Price for a cab ride
Events	Specific things that happen in products due to user interaction	Page view event User login event Add to cart
	It has two components 1) Name - App opened. 2) Properties - Date, Time, user ID, OS	App opened Pickup and Drop off Location entered. Cab confirmed Cab allocated.

Looking at the recorded events allows us to plot the user journey in our app.

Properties of events help us analyze users behavior further. Query and filter as per your needs.

Components of Product Analytics

Terminology	Explanation	Example
Metrics	Quantifiable measure that allows businesses to define and track the success of their product or their business activity.	GDP tracks growth of country. Success of checkout process in e-commerce can be measured by percentage of people who went from adding items in cart to actually buying it.
Segments	 Grouping users by common characteristics Demographic - Age , Sex , Gender, Location, Psychographic - Interests, Habits Technical - Technology used User behavior - Who spend more than an hour on your app. 	Avg. revenue per user for Delhi vs Mumbai. Type of food ordered by people under 25 vs people over 40. User who use Android phones
Funnels	Series of steps a user has to perform to achieve any goal in a product.	
Cohorts	Users are grouped into cohorts based on common characteristics they may share and which are generally time-bound.	

Components of Product Analytics

Terminology	Explanation	Example
Funnels	Series of steps to achieve a goal. Called funnel because of drop off at each stage Cab booking funnel. Sign up funnel.	 Lets think of cab ordering process in Uber User selects a pickup point -> selects destination -> selects a cab type -> Makes payment -> User confirms the cab
Cohorts	 Groups which are time bound or funnel bound. Used to analyze retention. Cohorts and Segments are used interchangeable 	 Users who signed up in Jan 1st week & are active by week 8. Users who signed up in March 1st week are active by 10 weeks.
Analytics	Product Analytics helps to understand what are the improvement opportunities and then measure the success of that improvement.	 Average Revenue Per User If Facebook users are engaged more in videos than photos then you will build more video ad products. This will result in higher ad revenue and increase average revenue per user.

Key objective	Implication
Different stakeholders use metrics to first define goals and then measure their success against these goals	Metrics are unlikely to be useful in practice unless it explicitly relates to a goal. Goals are meaningless unless there are metrics assigned to measure them
Why should metrics be aligned to goal?	 Ensures alignment among different teams on achieving the goal. Ensures focus so that everyone is working towards the same thing. Maintains an objective measure of success It creates a transparent picture of the condition of the product.
Characteristics of good metrics	 Should be aligned with companies growth objective Should be objective and measurable Should be easily understandable Should be actionable

Why Product Analytics

One of the key things product analytics can do is segment all of your churned users. You can then look at that group and retrace their footsteps. You can see how they interacted with your product.

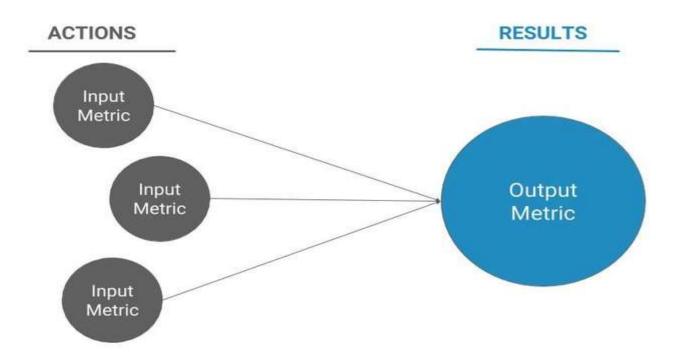
Generally, there'll be some important actions that your churned users never took. As a result, they may have missed your <u>product's Aha! moment</u> completely.

Armed with this information, you can improve your product's onboarding flows to direct new users to those crucial actions.

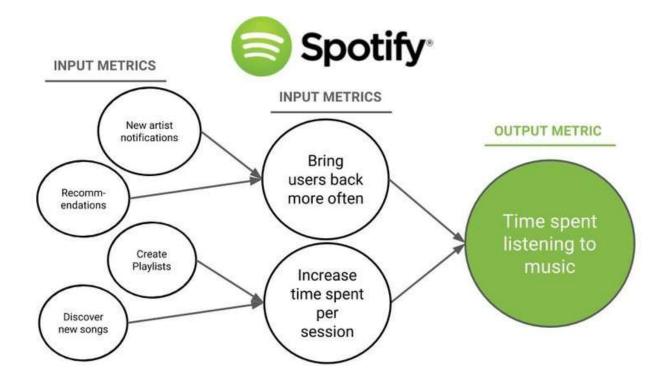
Product analytics can help you understand why users churn, so that you can improve your product and prevent it happening again.

Input vs Output Metric

Output metrics represent **results** and input metrics represent **actions**.



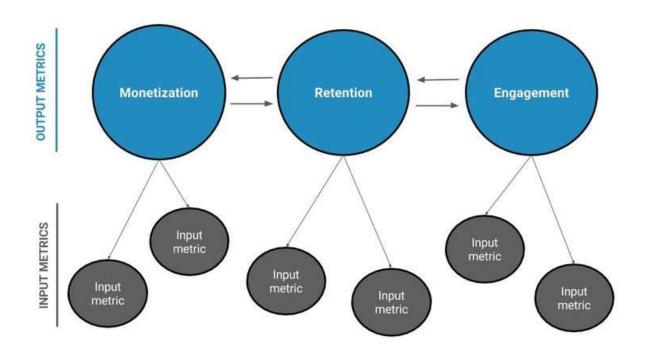
Metrics upGrad



Right Way to select Growth Metric

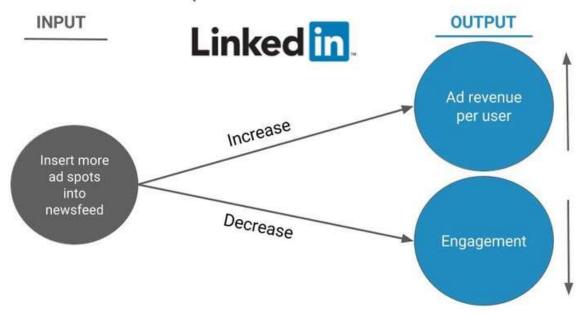
Steps	Details
Select constellation of metrics	Make sure that they account for retention engagement and monetization.
Break your output metrics into input metrics	Inputs that successfully improve the output are the leading indicators that you need to identify as soon as possible.
Understand and monitor your tradeoff metrics	Identify interdependencies & Counter – reaction Adapt as the business changes and identify new metrics

Constellation of Metrics



Trade off in metrics at LinkedIn

The Impact of Tradeoff Metrics



North Star (Output) Metric

Company	North Star (Output) Metric	Input Metrics	
YouTube	Total View Time	Goal – Bring back users more often Key Metric – Daily Active Users (DAU)	
		Goal – Increase the time spent per user per session Key Metric – Time spent per session	
Facebook	Daily Active Users (DAU)	Competing metrics :	
		Goal – Increase Monetization Key Metric - Revenue per user	
		Goal - Increase Engagement Metrics – Session Frequency, Time in App, Retention Rate	

Goal of PM	Example
PMs responsibility is to work on component of the	PM focuses on one part of customers journey.
product and improve the	Example: Flipkart has following components:
intermediate level metrics	Search, Merchandising, product page, Reviews, Checkout
	For these components what are key business objectives and what are key metrics? To decide the metrics we need to know the objective of your component. These could be: Display useful reviews to the user.
	 Quicksort products for the users. Increase user engagement

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Common Frameworks

METRIC	Implication
AARRR	 Measures growth Acquision – How do people discover our product? Which channels? Activation - Are these people taking the desired action or additional steps we want them to? Retention - Are our activated users continuing to use our product? Referral - Do users like the product enough to tell others about it? Revenue - Actual revenue targets for your users
PULSE	Tracks overall health of the product Limitation: Its an indirect metrics which makes it difficult to evaluate the impact of UI changes Page Views, Uptime, Latency, Seven day active users, Earnings
HEART	Measures success of design and user experience at large scale Happiness - Relates to subjective aspects of user experience. Visual appeal, ease of use, etc. Engagement – Users level of involvement with the product Adoption - Tracks how many new users start using a product during a given time period Retention - Track how many of the users from a given time period are still present in some later time Task Success - Incorporates effectiveness and efficiency.

METRICS	DESCRIPTION	
Happiness	Relate to subjective aspects of user experience • Satisfaction, Visual Appeal, Perceived ease of use, likelihood of recommending them.	
Engagement	Users level of involvement with the product. • Frequency, intensity, depth of interaction. For example: • Number of photos uploaded per user per day. • Percentage of active users who used Gmail five days a week.	
A doption	Adoption metrics track how many new users start using a product during a given time period	
Retention	Retention metrics track how many of the users from a given time period are still present in some later time period • Example: percentage of seven-day active users in a given week who are still seven-day active three months later	
Task Success	Incorporates effectiveness and efficiency. Example - % of task completed, Time to complete, Error rate.	

HEART Framework – Measures key UX metrics

HEART Framework is based on the GOALS - SIGNALS - METRICS model

METRICS	DESCRIPTION
GOALS	Goals are broad objectives that we wish to measure Relate to subjective aspects of user experience • For happiness, a goal might be to increase user satisfaction.
SIGNALS	Signals are indicators that your team is making progress towards its goal. What actions would indicate the goal had been met? • For engagement a sign might be "users are spending more time per session in our software."
METRICS	Quantifiable data, points indicating success or failure. • For retention, a useful metrics might be reduced churn.

HEART Framework – Illustration

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	GOALS	SIGNALS	METRICS
Happiness	Users find the app helpful, fun, and easy to use	Responding to surveysLeaving 5-star ratingsLeaving user feedback	Net Promoter ScoreCustomer satisfaction ratingNumber of 5-star reviews
Engagement	Users enjoy app content and keep engaging with it	Spending more time in the app	 Average session length Average session frequency Number of conversions (consuming content, uploading files, purchases, etc.)
Adoption	New users see the value in the product or new feature	Downloading, launching appSigning up for an accountUsing a new feature	Download rateRegistration rateFeature adoption rate
Retention	Users keep coming back to the app to complete a key action	Staying active in the appRenewing a subscriptionMaking repeat purchases	Churn rateSubscription renewal rate
Task Success	Users complete their goal quickly and easily	Finding and viewing content quicklyCompleting tasks efficiently	Search exit rateCrash rate

HEART Framework for 2 step verification

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	Goals	Signals	Metrics
Happinness	That our clients feel even more satisfied and secure using our products.	Positive feedback when we ask our users about the feature in the form of a survey.	The percentage of our client base that feels more satisfied and secure after enabling the feature.
Engagement	N/A	N/A	N/A
Adoption	To have the majority of our user-base enable the two step verification feature.	When a client enables the functionality in the security settings page.	The number of clients who enabled the functionality versus the total number of client accounts.
Retention	The users who enabled the feature continue to use it throughout the whole duration of their contract.	User churn is shown when a client disables the feature in the security settings page.	The duration of feature use, being measured from the day a user enables it to the day they disable it, in relation to their total contract length.
Task Success	That all users who enable the feature, manage successfully after the first try (there are 3 steps to enabling the feature).	The event logs per user show that all three steps were completed successfully in the first go.	The number of users that completed all three steps successfully in the first go

HEART Framework for 2 step verification

	GOAL	SIGNALS	METRICS
HAPPINESS	For users to feel like the site is unique	A satisfaction rating from a survey	Satisfaction Perceived ease of use Net promoter score
ENGAGEMENT	For users to keep discovering more content	The amount of time people spend viewing from analytics	Number of videos watched per user per week Number of uploads Number of shares
ADOPTION	For users to use the site or app	The number of signups per day from analytics	Upgrades to latest version New subscriptions Purchases by new users
RETENTION	For users to continue to use the site or app	The number of return customers from customer data	Number of active users Renewal rate Repeat purchases
TASK SUCCESS	For users to accomplish their goal	The number of successful completes from a study	Search result success Time to upload Profile creation completion

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Using AARRR Framework

Step 1 : Identify your AARRR metrics

OBJECTIVE	DESCRIPTION	METRICS
A cquision	 Which channels are giving you most users? SEO, Social Media, Marketing campaigns, Apps and Widgets, Advertising. What is the cost of acquiring new users?, etc. 	 Total # of new users Total users by channel Customer Acquisition Cost CPC , Bounce Rate
A ctivation	Are these people taking the desired action or additional steps we want them to? • Visiting additional pages. • Experimenting with additional features • Spending a given amount of time on your website • Signing up for your newsletter? • Signing up for your free trial.	 Twitter: Users follow 4-5 users Pintrest: Creating first pin. E-Ecommerce – First booking Mixpanel – User tracks first event Salesforce – User logs your first lead
Retention	 User engagement determines the depth of product usage Returning to your product repeatedly in a given timeframe Opening your company's email. Signing up for your RSS feed Frequently booking taxis or ordering food. 	 Netflix - # of mins video is viewed per week. Time spent per day Airbnb - # of booking per user/year

Using AARRR Framework

Step 1: Identify AARRR framework

METRICS	DESCRIPTION	METRICS
R eferral Metrics	Do users like the product enough to tell others about it? You can set up tools and campaigns to track referrals such as • Emails with referral promotions embedded. • Referral contests • Other marketing campaigns designed to make it easy to share the product with others.	
R evenue Metrics	Identify actual revenue targets for your users It will help you understand whether or not your cost for activation, acquisition and other efforts lead to profitable growth. You may want to know the following Minimum revenue Break even revenue Revenue that exceeds the customer acquisition cost.	

Using AARRR Framework

Remaining steps

METRICS	DESCRIPTION
Step 2 : Setup process to track AARRR	 After you have decided on the data that you need to collect, you need to implement tools and methods for collecting and analyzing data. If your product is digital and online you can use google analytics and KISS metrics to capture much of this information. In this stage it is important that your team determines an estimated dollar amount for each category of user behavior. It will be the only way to know whether or not your product management and marketing initiatives are working in a given category.
Step 3 : Run Tests	 Run tests for all stages of user behavior to identify better approaches. As you gather this data, run plenty of A/B tests to find where you can improve user engagement at each stage of AARRR. Run several versions of referral contests to see which one drives the most users to tell their friends about the product. Or you might experiment with increasing your problem relations output
Step 4 : Improve Product	Adjust your product management and marketing initiatives accordingly

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The Mobile App Customer Purchase Funnel Cheat Sheet



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Key Business Metrics

Company Type	DESCRIPTION
SaasS Companies	 Key Ratio to consider – LTV: CAC if LTV: CAC > 3, the business is considered to be healthy. if LTV: CAC < 3, it indicates CAC is too high and growth might be unsustainable Another key metrics could be the number of support tickets per week per weekly/monthly active user
Consumer FinTech companies	Avg. credit score of the user to whom you are giving loan.
eCommerce companies	 Cart abandonment rate – It is the percentage of user who add a product to the cart but do not make the final purchase.
Marketplace Companies	Key supply metric – Average ETA of a ride (For Uber)

Choosing and Prioritizing metrics

	DESCRIPTION
MECE	 Mutually - Exclusive - Collectively - Exhaustive We should track everything that measures the performance of your product but we must ensure that each data point, metric or event that we track are mutually exclusive but collectively exhaustive.
Metrics used depend on business goal	 PM at Facebook focusing on overall engagement would measure Time spent per user per day on the mobile app Number of day active users / Number of monthly active users. PM – Video Products at Facebook would measure Average view time.
Team focuses on the metrics that is being tracked	 Average number of video viewed. PM of homepage at eCommerce company Goal – Improve the conversion from home page Key metrics to monitor - % of users who click on one of the products showcased on homepage

Choosing and Prioritizing metrics

Use case: Let users upload an image in the product review module.

Product Stage	Open items	Action item
Pre Launch	What will you track ?	Track the different actions of the user . Check whether the image upload flow is working correctly & where it breaks.
Post Successful Launch	What could the objectives be ? How do you measure the benefits and adoption of this new feature ?	Monitor user experience to see if it is smooth. Measure product adoption. Measure user engagement. (How many other customers click on these images)
Steady state	How do you measure the performance of overall component ?	Utility for customers - Identify the number of customers who find the review helpful. (Customers who have clicked thumbs up icon) Coverage – Identify the number of products that have images reviews.

Choosing and Prioritizing metrics

Use case: Let users upload an image in the product review module on e-Commerce Site.

Theme	Metric
	L0 Metrics
Review coverage	Percentage of page views with reviews Percentage of products with reviews
Engagement	Helpful clicks per review view.
Contribution	Reviews per units
	L1 Metrics
	Email
Contribution	My order page
	Notification

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Key Acquisition Metrics	Key Revenue Metrics
 Total Users Customer Acquisition Cost (CAC) Cost per Click (CPC) Bounce Rate Cost per App Install 	 Average Revenue per User (ARPU) Gross Merchandise Value (GMV) Gross Margin/ Gross Profit Lifetime Value (LTV) Conversion Rate (Free to paid users) Monthly Recurring Revenue (MRR)

Key Metrics



Key Retention Metrics	Key Referral Metrics
 Daily/Weekly/ Monthly Active Users (DAU/MAU/WAU); Churn Rate 	 Net Promoter Score (NPS) Viral Coefficient (K) Referral Invites Sent Revenue from Referral Signups

Segmentation By Acquisition

Purpose of segmenting by Acquisition	Major metrics to keep an eye on
Segmentation by acquisition helps you focus your efforts on attracting users through the channels working best for you. Usually, this is done by marketing campaigns like payper-click, social media ads, email ads, and affiliate campaigns.	 Total visits Cost per visit First-time visitors Bounce rate Conversion

Segmentation By Behaviour

Significance of segmenting by behavior	Major metrics to keep an eye on
Behavior refers to the activities performed by users while using a product. Examples: • Benefits sought by customers • Product usage frequency. • Occasions on which people purchase. Segmentation based on behavior is important because it helps • Product manager in designing product feature according to the preferences of the segment • Monitor the growth and decline in key market segments.	 Where do these user come from? Do they buy a lot? Do they engage through social media or reviews? Where did they abandon the cart? Did they come back to complete the purchase or not?

Segmentation by behavior at GOIBIBO	Major metrics to keep an eye on
1. Focus was on increasing the retention of the users coming from SEO. This was achieved through the following: Referral Programs GoContacts Price Personalization	

Segmentation By Outcome

Se	gmentation by outcome of product use	Major metrics to keep an eye on
1.	Outcomes are the user activities that add value to the product. Why is it necessary to segment users by outcome? Because these are the users who add value to your product. They could be buying stuff or paying for paid subscription.	 For Amazon outcome segment could be: Order value is 30% more than the avg value. Add product to wish list. Return 50% more orders than average
•	Identify most valuable users. Identify what makes these users unique from other users. Identify why they end up completing the transaction while others don't. Use data points from these users so that they become loyal users.	For blog it could be users who subscribe.

Segmentation By Outcome

Outcome Segment	Insight from Data	Action
Order value is 30% more than the average value.	Why is the transaction value higher for them ?	Push special offers to them.
Add products to wish list.	Waiting for price drop.	Send notifications / email when the price drops
Return 50% more orders than avg.	Identify reasons for return	Strategy for minimizing returns.

Segmentation By Outcome

Segmentation by outcome at GOIBIBO Feature : Reserve now pay later

Outcome Segment	Insight from Data	Action
Users who reserve and end up booking	Tentative about dates, Sure about destination.	Flexibility to modify group dates.
Users who reserve and end up cancelling	Tentative about group size.	Flexibility to modify the number of passengers

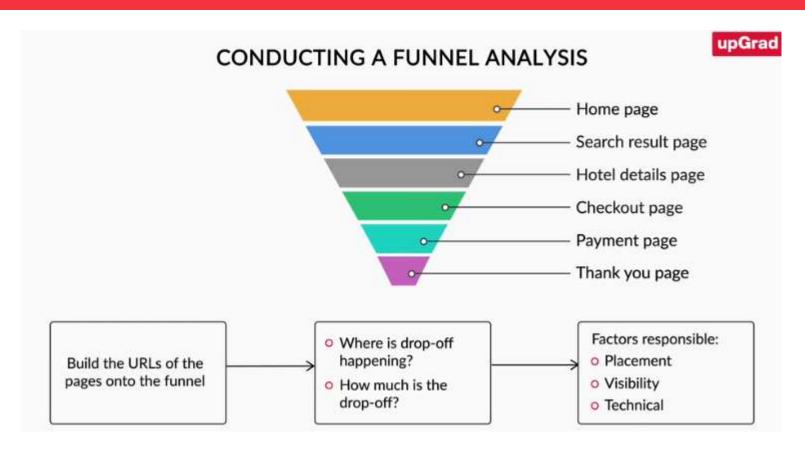
Funnel analysis starts with user flows. There are certain activities that a user performs which involve a number of steps. The sequence of these steps is called the user flow or funnel. At each step, there is a chance of drop-off, so it's important to optimize this process and reduce the drop-off as much as possible. Funnel analysis helps you do exactly this.

Funnel analysis is important because it allows you to identify drop-off points and their causes. Using this information, you can optimise every step of the funnel and leverage everyday traffic to increase your revenue. For funnel analysis, you can use tools like Google Analytics, Mixpanel, and Localytics

Funnel Analysis



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Funnel Examples

Stages of Marketing Funnel

- **Awareness** Stage where a potential customer is drawn toward the product through campaigns and consumer research. The lead is generated through this stage.
- **Interest** Stage where the potential user learns more about the product. The nurturing of the leads takes place through targeted emails and content in order to educate the customer.
- **Consideration** Stage where the leads have shown considerable interest to be termed them as marketing qualified leads. These are now seen as prospective customers.
- **Intent** Stage where the prospect finally demonstrates his/her interest in purchase. This can be shown through a product placed in a shopping cart or through repeated views.
- **Evaluation** Stage where the buyer makes a final decision to purchase the product or not. This is just before the final payment and this is a stage where most of the prospects are dropped due to price fluctuation or lack of intent.
- **Purchase** Stage where the customer finally crosses the line of evaluation and makes the purchase. Now the prospect has turned into a paying customer.
- **Loyalty** As a loyal customer, one becomes an influencer for other prospective customers.

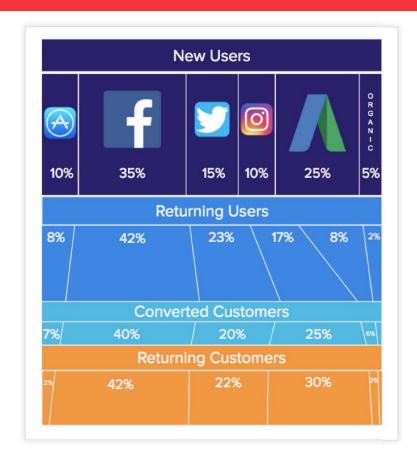
Stages of Marketing Funnel

Major stages of a customer experience funnel are

- **Repeat** -Stage where the customer purchases repeatedly, turning them into repeat customers. This is done by nurturing customers to make bigger purchases.
- Loyalty Stage where the customer develops a preference to the product hence identifying with it.
- **Referral** Stage where the customer is loyal to the product and is likely to make referrals and recommend brand products to others.
- Advocacy Stage which is the pinnacle for the evolution of customer nurturing. Here customer turn into
 evangelists writing favorable reviews, social media posts and help tremendously in creating new leads
 for the product.

- Facebook accounts for 40% of our paying customers, but new users acquired via Instagram are converting at a higher rate.
- Google Ads campaigns get us 25% of our new users, but only 6% of them become paying customers.
- It's pretty clear we should ramp up efforts on Instagram and decrease our Google Ads spend.

Source: https://medium.com/mobile-marketing-insights-by-clevertap/funnel-analysis-how-to-use-funnels-to-convert-more-mobile-app-users-3302c1511915



Cohort Analysis

How does cohort analysis help?

Cohort analysis can help you assess the performance of new marketing campaigns. You can create cohorts of the customers acquired after running each new marketing campaign and assess which campaign leads to maximum conversion. The campaign that leads to maximum conversion might be the best for your product.

As a product manager, cohort analysis helps you understand whether you need to spend on retaining your existing customers or acquiring new customers. You can group your customers into cohorts by month or week and assess whether the revenue from each of the subsequent cohorts is increasing or decreasing. If the revenue from subsequent cohorts is decreasing, then you can look to spending more on customer retention.

Cohorts by segmentation can help you understand customer behavior, which leads to better conversion.

Cohort Analysis In Action

CONDUCTING COHORT ANALYSIS WITH CLEVERTAP ixigo

Issue	User action: Install → Convert (buy a ticket) → Uninstall
Cohort Analysis	Identify users who uninstall after conversion
Insight	Most users uninstalled one day after conversion
Solution	Automated email/SMS campaign triggered at uninstall i. Offer discounts ii. Get feedback on reason for uninstall iii. Encourage user to download again
Result	6-7x increase in repeat transactions

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LTV Calculation using ARPU method

Calculating LTV using ARPU per month:

ARPU/Month = Total Revenue per user / Number of months user has been active.

LTV = Avg. ARPU per month for each customer x Desired timeframe

Drawbacks of calculating LTV using ARPU

ARPU method of calculating customer LTV assumes that all active customers generate the same amount of revenue. This does not let you focus on your high value customers.

This method does not capture the frequency of purchases. It only captures the total value of purchases.

It assumes that all active customers generate the same amount of revenue.

It does not focus on your customers behavior.

LTV Calculation using Cohort Analysis

Process of conducting cohort analysis

- 1. Define the business goals.
- 2. Define the cohorts: Done on parameters such as user demographics, user actions & time periods
- 3. Identify metrics to track
- 4. Conduct Cohort analysis: Using Mixpanel or Google Analytics.

Advantage of calculating LTV cohort analysis

Cohort analysis does not assume all months to be the same when it comes to revenue.

USE CASES OF WEB ANALYTICS



Understanding Customer Behaviour

- b. Which segments of customers have a better customer journey?
- c. What products do they purchase together?
- d. What products do they purchase in sequence?
- e. What is the repeat behaviour of the customers?



Advertising Campaigns Analysis

- a. How is the campaign working?
- b. Which parts are working/not working?
- c. Which segment is the campaign working on?
- d. How is the performance of the people acquired through the campaign?



Measuring Acquistion Effectiveness

- a. Direct customers
- b. Search engine optimisation
- c. Paid search
- d. Social media referrals
- e. Partner/affiliated sites

"A product manager working at redBus, an online bus ticketing platform, can leverage the capabilities of web analytics to determine at which step of the bus booking process most of the users often drop off.

All analytics products capture user activity using events, which are interactions with the application.

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