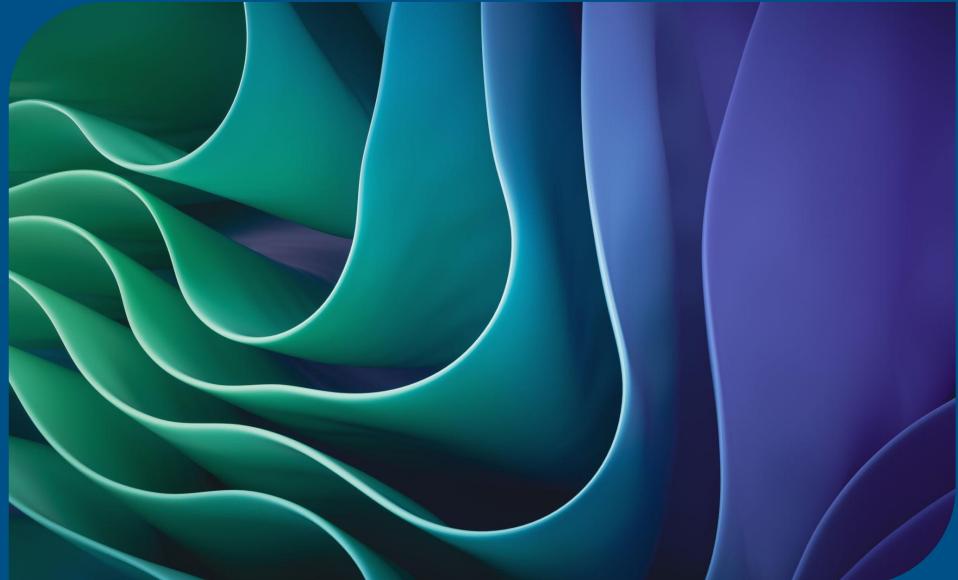


# Retention Calculation

Metrics & Models

Mahdi Nasseri



# Who am I

**Snapp!  
Market**

دیوار

بازار

فیلیمو  
filimo

Insight & Data Analysis Manager  
Snapp!Grocery

Insight Team Manager  
Divar

Data Analysis & Reporting Manager  
Bazaar

Data Analytics Consultant  
Filimo, Sibapp, Virgool, Basalam



**Mahdi  
Nasseri**

# The Simple Mathematics of Retention

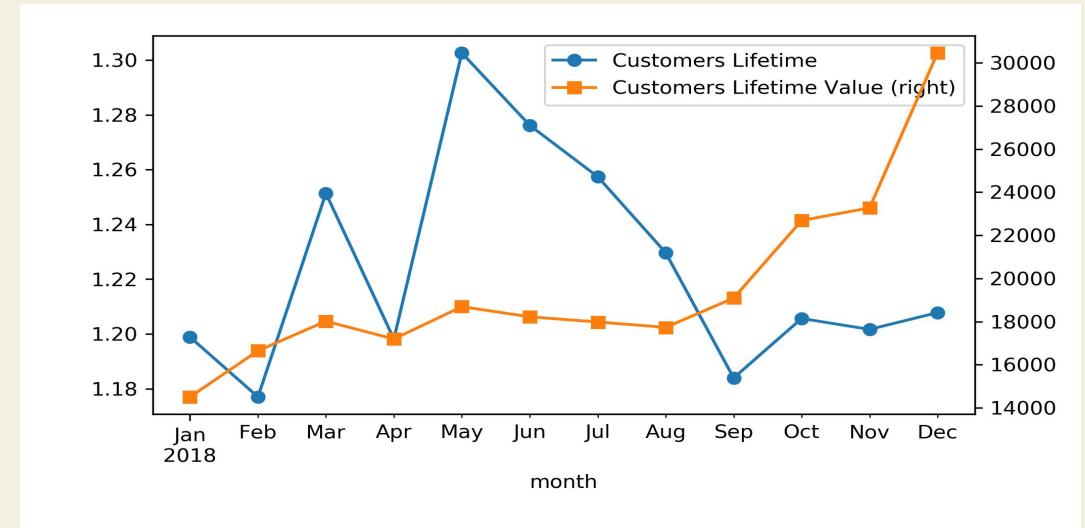
The ability of a business to **keep customers**, users, or subscribers engaged **over a period of time**.

It is a key indicator of customer **loyalty, product-market fit, and long-term business success.**



# Customer Lifetime Value

$$CLV = ARPU \times \frac{1}{Churn\ Rate}$$

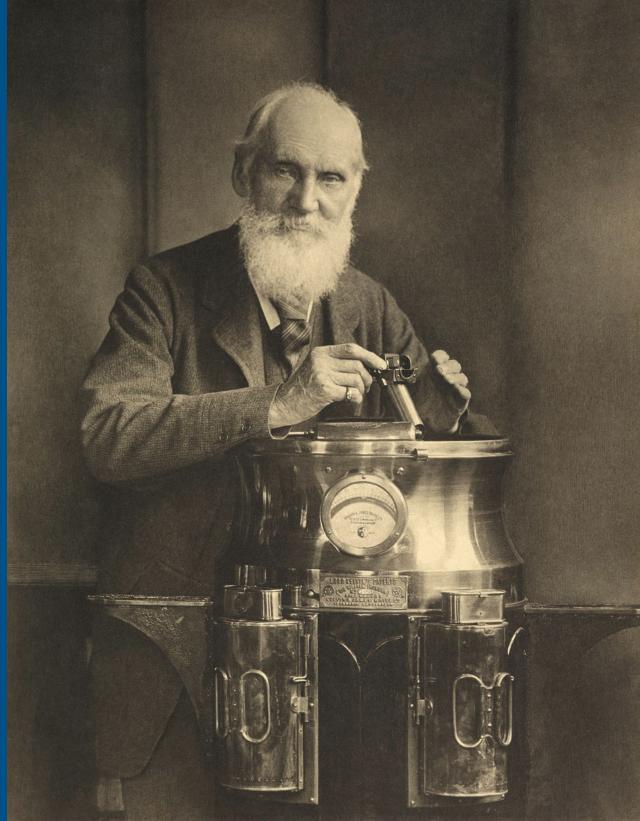




1. Metric that Matters
2. Retention Calculation
3. Cohort Analysis
4. Churn Analysis
5. MRR Analysis

# If you cannot measure it, you cannot manage it.

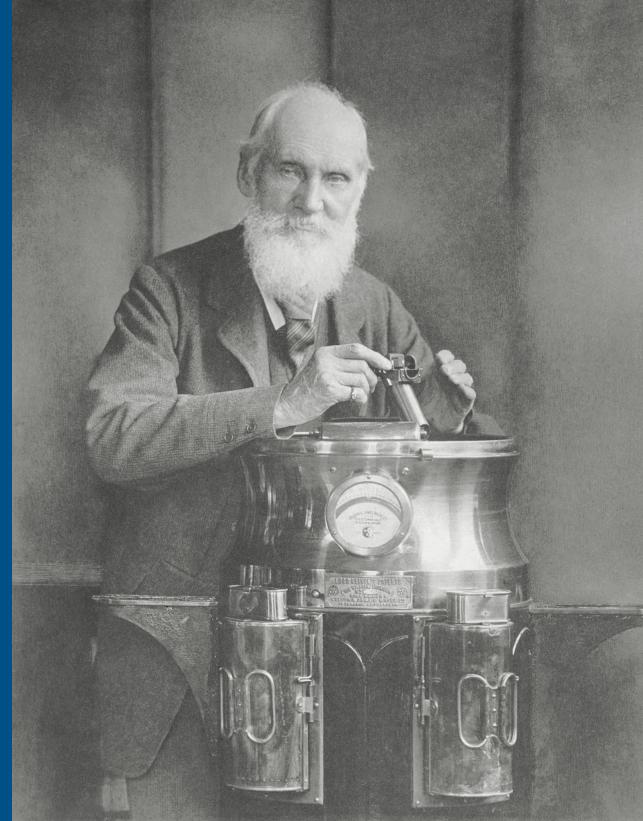
"When you can measure what you are speaking about, and express it in numbers, you know something about it."



Lord Kelvin 1824–1907  
British scientist

# If you cannot measure it, you cannot manage it.

"When you can measure what you are speaking about, and express it in numbers, you know something about it."



Lord Kelvin 1824–1907  
British scientist

# A good metric ...

is comparative.

is understandable.

**is a ratio or a rate.**

is changes the way you behave.

## **Provide Context:**

Give data meaning by comparing it to benchmarks or goals.

## **Enable Comparability:**

Allow comparisons across time, segments, and units.

## **Highlight Efficiency:**

Focus on the effectiveness of actions, not just totals.

## **Offer Actionable Insights:**

Reveal trends and areas for improvement.

## **Scale with Growth:**

Measure performance consistently as the business grows.

## **Easier to Interpret:**

Simplify complex data for better decision-making.

# Retention Rate

The percentage of customers who **continue to use** your service or product over a predetermined period.

1. Metric that Matters
2. Retention Rate Metrics
3. Cohort Analysis
4. Churn Analysis
5. MRR Analysis

# Retention Calculation based on Business Model

1. Subscription based
2. Transaction based
3. Fast-Transaction based
4. Impression based
5. Engagement based
5. Activity based

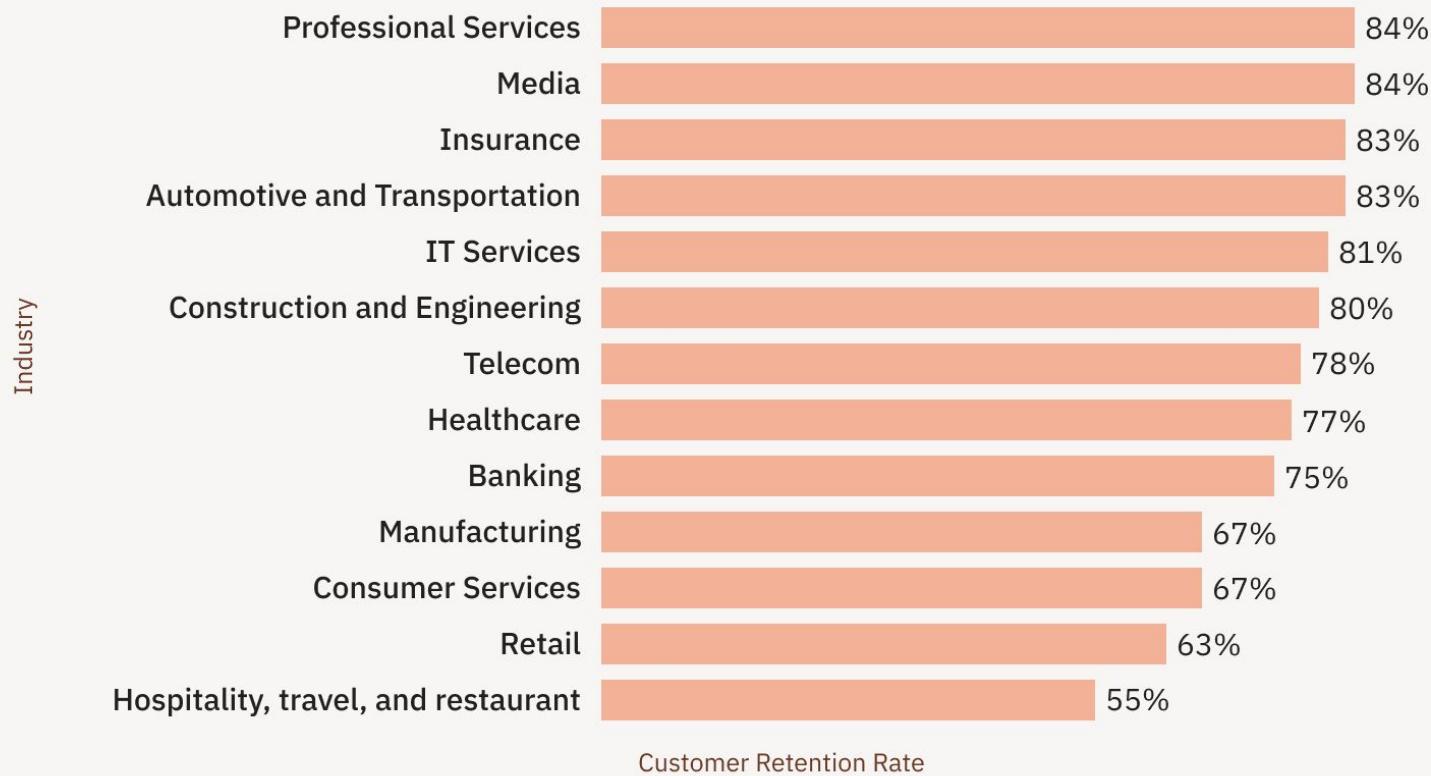
# Subscription based Business Models

SaaS  
Media & Content Apps (Paid)

## Subscriber Retention Rate

$$\frac{\text{Subscribers at End} - \text{New Subs}}{\text{Subscribers at Start}} \times 100$$

## Customer Retention By Industry

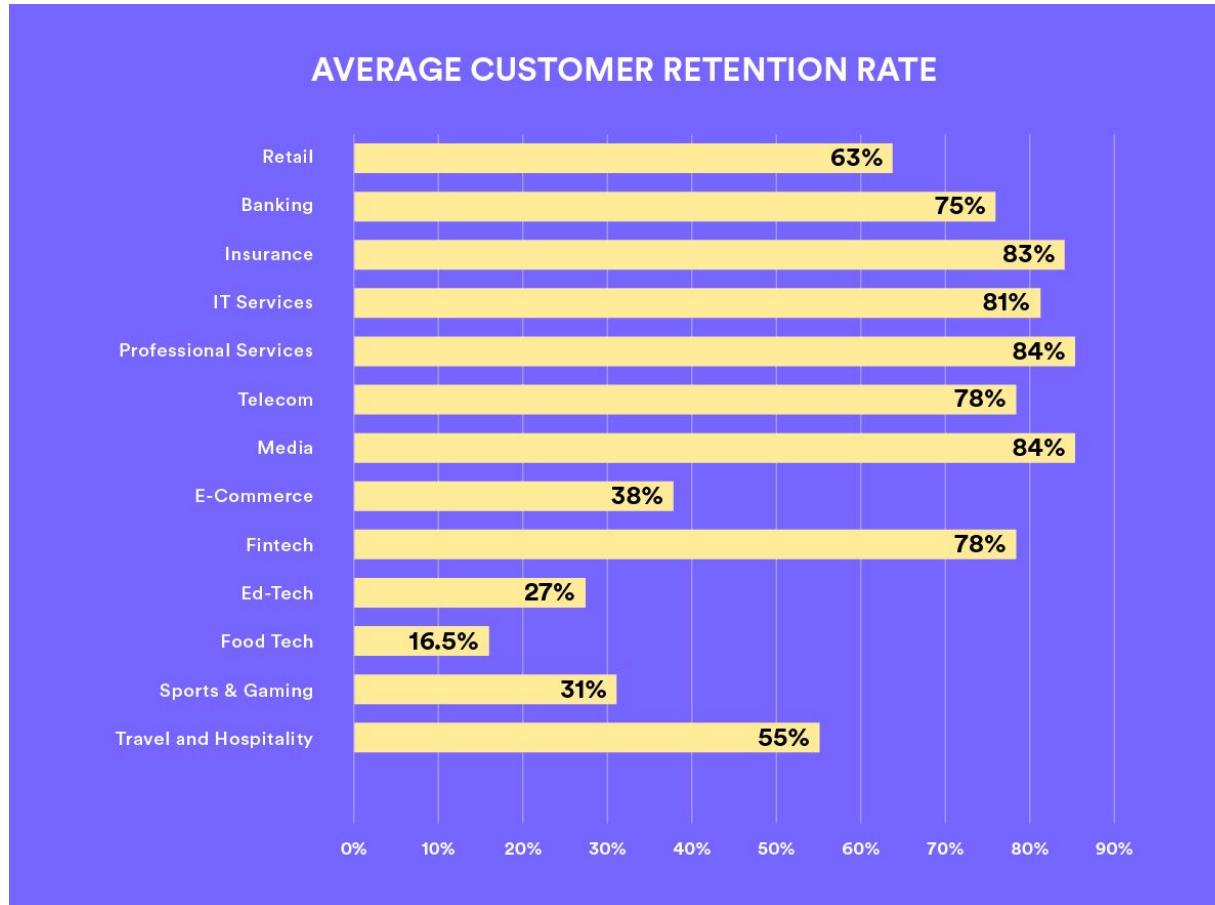


# Transaction based Business Models

Retailers  
Marketplaces

## 1. Customer Retention Rate

$$\frac{\text{Returning Buyers in Period}}{\text{Total Buyers in Previous Period}} \times 100$$



# Transaction based Business Models

Retailers  
Marketplaces

## 2. Repurchase Rate

$$\left( \frac{\text{Repeat Customers in Period}}{\text{Total First-Time Customers in Period}} \right) \times 100$$

# Fast-Transaction based Business Models

FMCG

On-Demand Services

**Transaction based +  
Repeat Purchase Rate**

$$\left( \frac{\text{Customers Who Made Multiple Purchases in a Timeframe}}{\text{Total Customers}} \right) \times 100$$

# Impression based Business Models

Media & Content Apps (Free)

## Engagement Retention

$$\left( \frac{\text{Returning Users}}{\text{Total Users in Previous Period}} \right) \times 100$$

# Engagement based Business Models

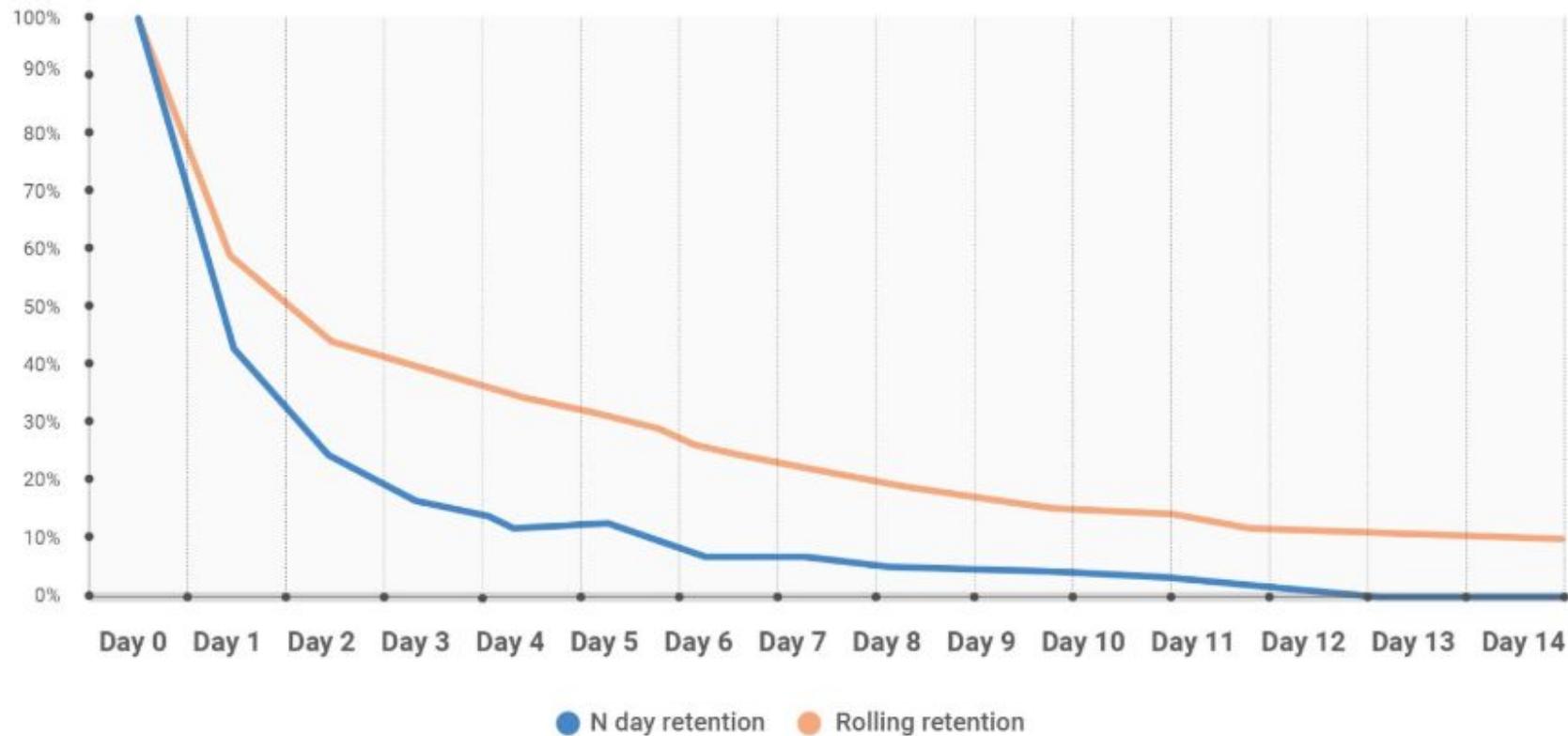
Gaming Applications  
Free Applications

**Transaction based metrics (for Paid) +  
Impression based metrics +  
Day-N Retention**

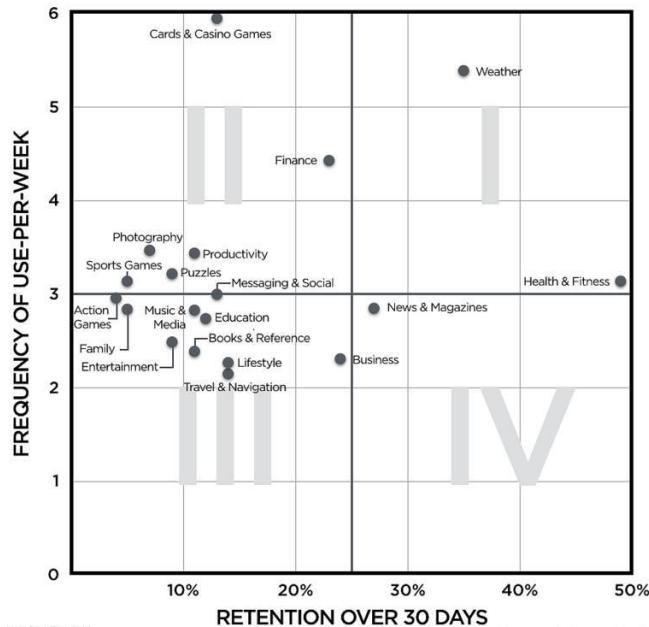
$$\frac{\text{Users Active on Day-N}}{\text{Users Who Installed on Day-0}} \times 100$$

DAY 0	DAY 1	DAY 2	DAY 3	DAY 4
User opens the App	User doesn't open the App	User opens the App	User doesn't open the App	User opens the App
				
				
User counted	User not counted	User counted	User not counted	User counted

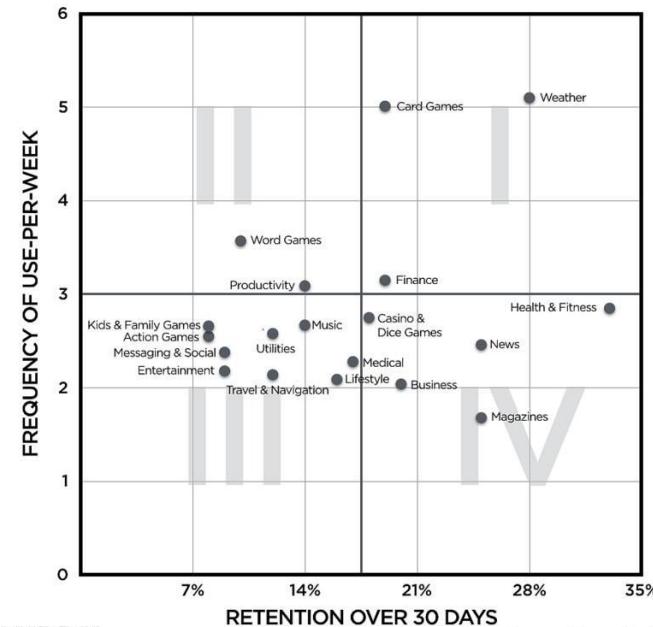
## Day N retention



## LOYALTY BY APP CATEGORY (ANDROID)



## LOYALTY BY APP CATEGORY (iOS)



# Activity based Business Models

Social Media  
UGCs  
Messengers

**Engagement based metrics +  
Stickiness (DAU / MAU Ratio)**

$$\left( \frac{\text{Daily Active Users (DAU)}}{\text{Monthly Active Users (MAU)}} \right) \times 100$$

A rate of 50% means that on average each user uses your service 15 out of 30 days.



Standard DAU/MAU is 10%-20%. Only a handful of companies top 50% @WhatsApp leads industry w/ stunning 70%+ engagement

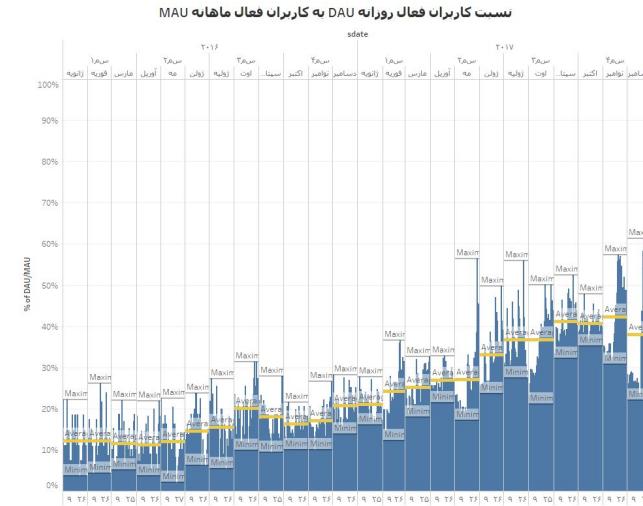
**Sequoia Capital**  
Four Numbers That Explain Why Facebook Acquired WhatsApp  
WhatsApp Co-Founders Jan Koum and Brian Acton Earlier today, Facebook announced its acquisition of WhatsApp for \$16 billion... sequoiacapital.tumblr.com

RETWEETS 95 LIKES 93

7:53 PM - 19 Feb 2014

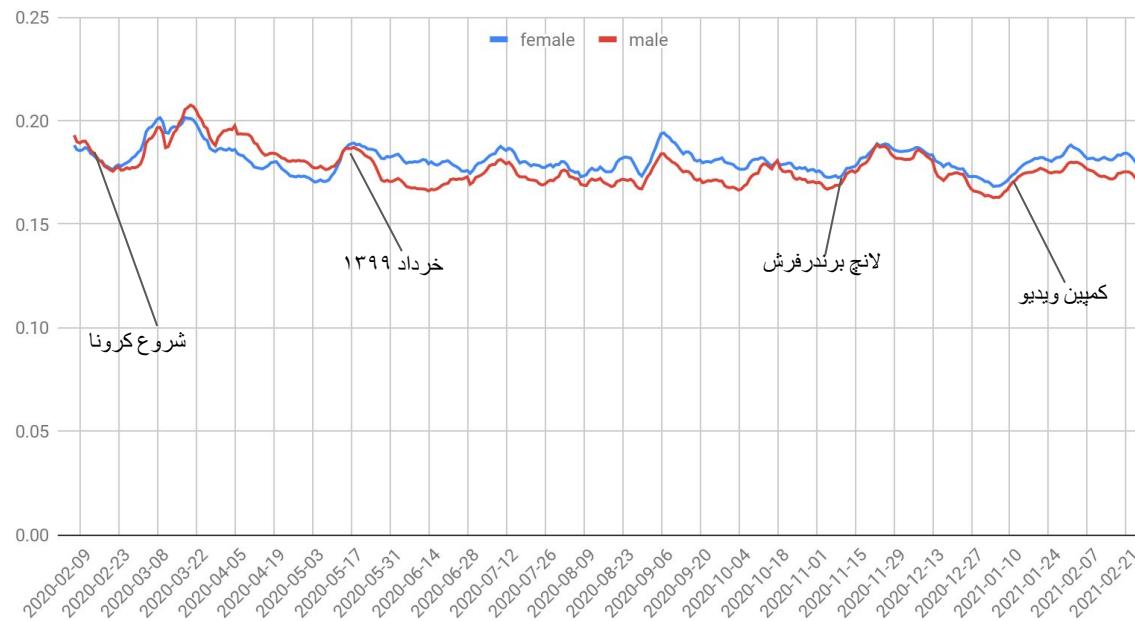
RTs 95 Likes 93

**Messaging Apps:** 60-80%  
**Social Media:** 50%+  
**Gaming:** 30-40%



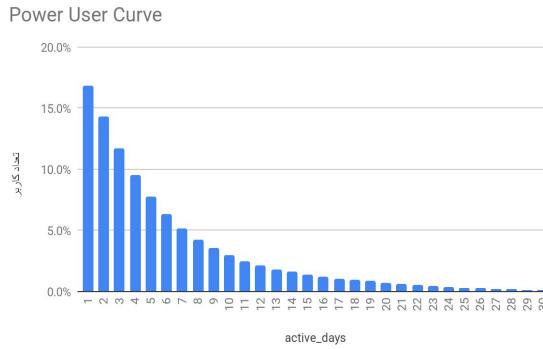
**Twitter = 44%**  
**Facebook = 65%**

## Stickiness (DAU/MAU)

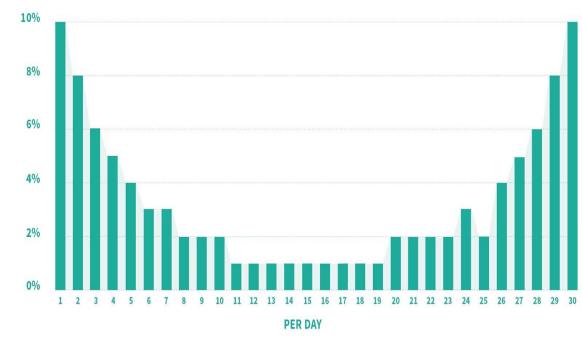


# Power User Curve

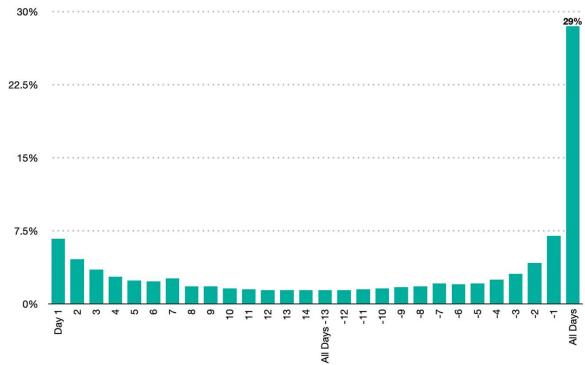
**Steep drop-off:** Most users are not engaged frequently (bad).



**Flat curve:** Users are consistently engaged (good).



**High peak on the right:** A strong group of power users (ideal).



1. Metric that Matters
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# Cohort Analysis

## Understanding Retention Over Time

A method of tracking and analyzing groups of users who share **a common characteristic over time**.

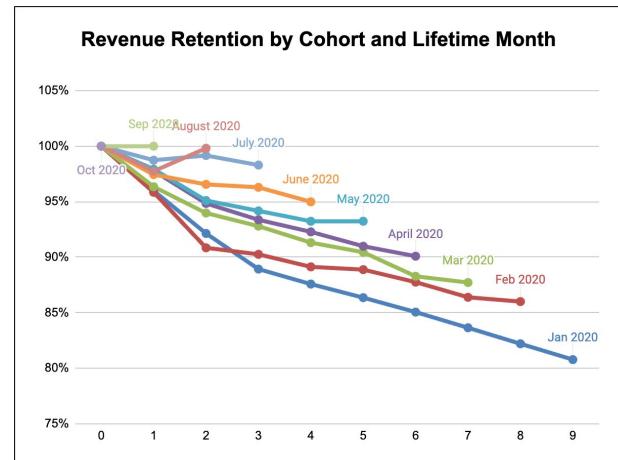
Types of Cohorts:

- **Acquisition Cohort:** Groups users by signup date.
- **Behavioral Cohort:** Groups users by in-app actions or purchase behavior.

## Cohort Analysis

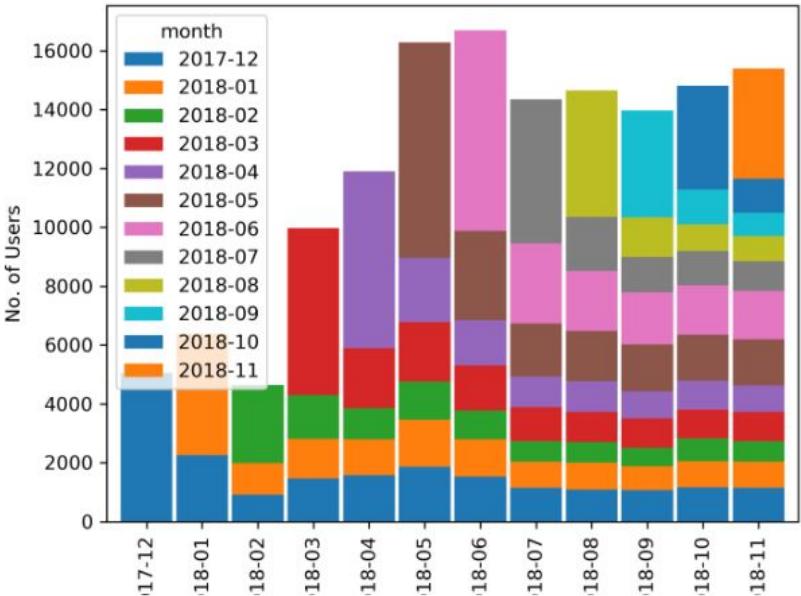
## Retention Calculation

Conversion rate in n'th month  
for last-12 monthes



## Cohort Analysis

## Retention Calculation



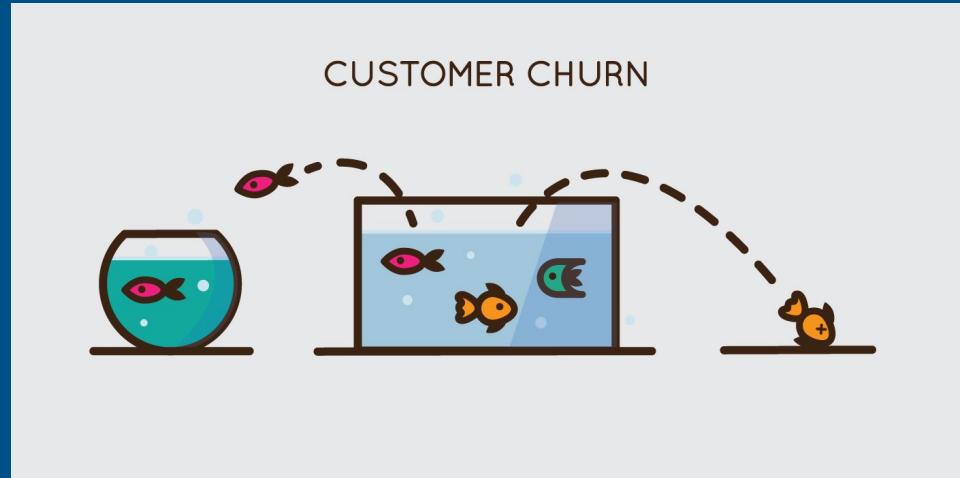
Analyzed by Foreyska.com

	0	1	2	3	4	5	6	7	8	9	10	11
2017-12	1.9	0.85	0.34	0.55	0.59	0.7	0.57	0.43	0.41	0.4	0.44	0.43
2018-01	1.98	0.51	0.64	0.59	0.77	0.61	0.43	0.44	0.39	0.43	0.43	
2018-02	1.63	0.91	0.65	0.8	0.6	0.43	0.43	0.39	0.47	0.42		
2018-03	2.29	0.82	0.82	0.62	0.46	0.41	0.4	0.4	0.4	0.4		
2018-04	2.37	0.86	0.61	0.41	0.42	0.37	0.39	0.36				
2018-05	1.79	0.74	0.44	0.42	0.39	0.38	0.38					
2018-06	1.5	0.6	0.45	0.39	0.37	0.36						
2018-07	1.83	0.68	0.45	0.44	0.38							
2018-08	2.16	0.67	0.45	0.42								
2018-09	2.43	0.79	0.53									
2018-10	2.54	0.83										
2018-11	2.36											
Average	2.06	0.75	0.54	0.52	0.5	0.47	0.43	0.4	0.42	0.42	0.44	0.43

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# Churn Analysis

**Understand and reduce customer attrition** by identifying why users leave and how to improve retention to **optimize retention, reduce revenue loss, and build customer loyalty**

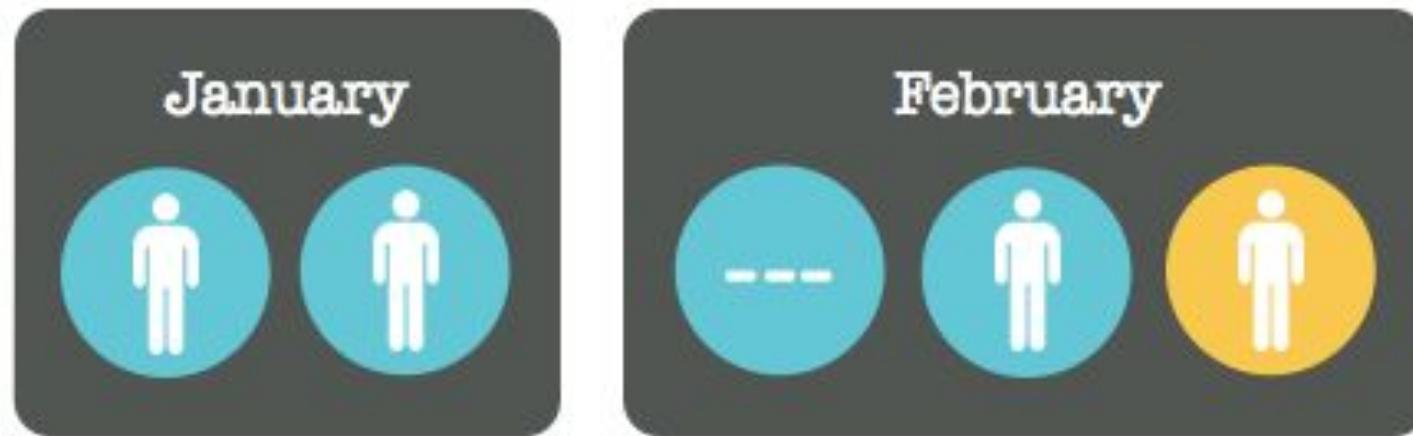


$$\text{Churn Rate} = \frac{\text{Total customers churned this time period}}{\text{Total customers at the start of this time period}}$$



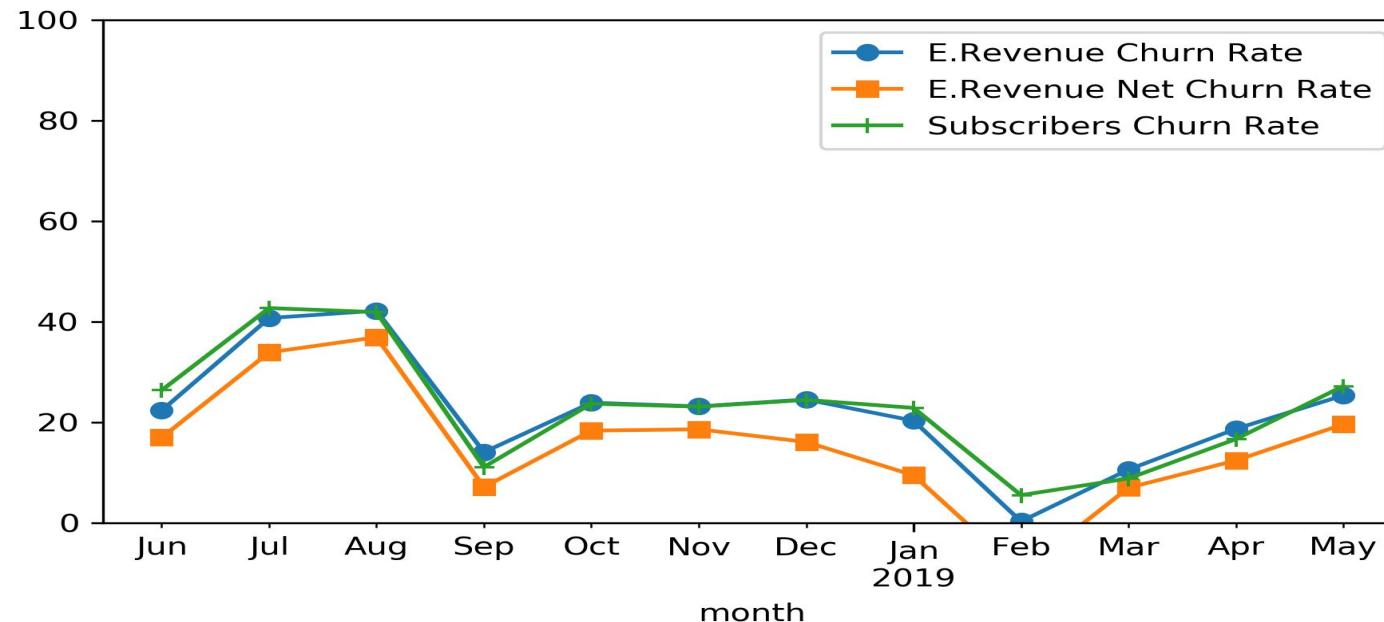
Customer Churn Rate: 50%

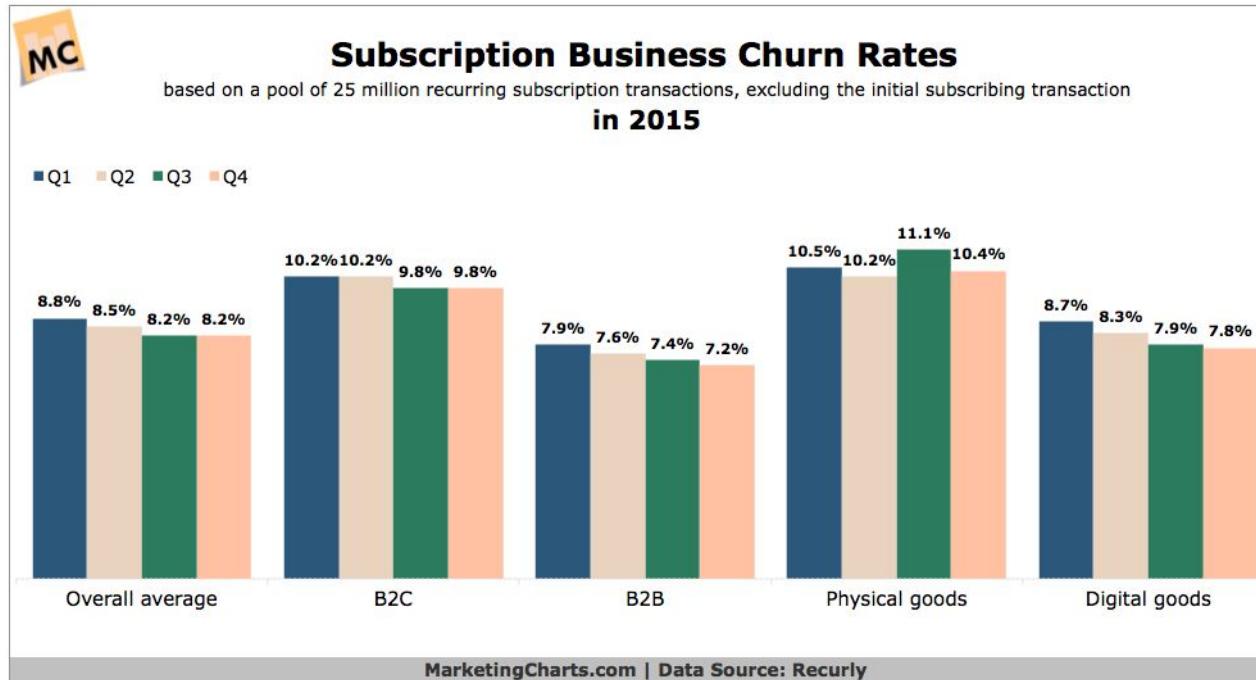
Revenue Churn Rate: 2%



Net Churn Rate: 0%

Gross Churn Rate: 50%

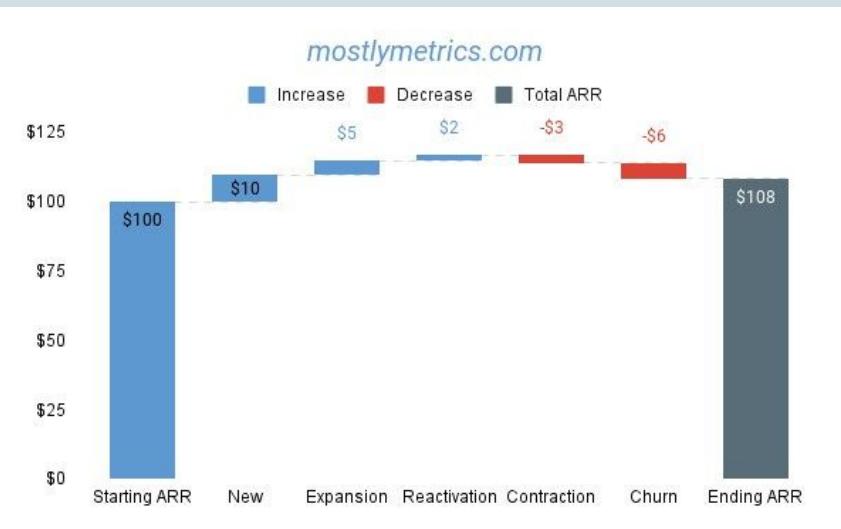




- 1. Metric that Matters**
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# MRR Analysis

Common in **SaaS, membership, and subscription-based businesses.**



## ① New MRR

Revenue from new customer subscriptions.

## ② Expansion MRR

Revenue from plan upgrades or add-ons.

## ③ Contraction MRR

Revenue lost due to customer downgrades.

## ④ Churned MRR

Revenue lost from customer cancellations.

## ⑤ Reactivation MRR

Revenue from **previously churned customers** who re-subscribe.

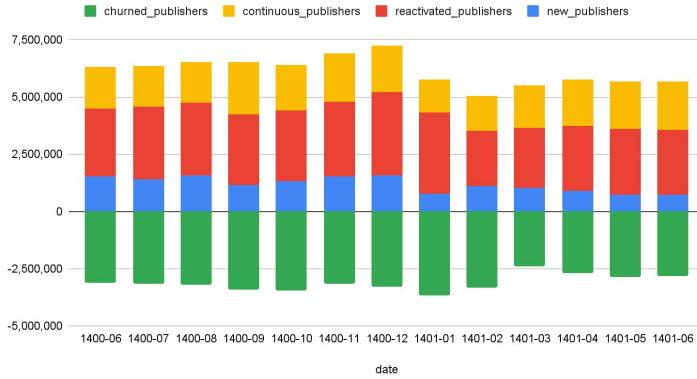
## ⑥ Net MRR Growth

The final MRR after adding new, expansion, reactivation MRR and subtracting churn & contraction.

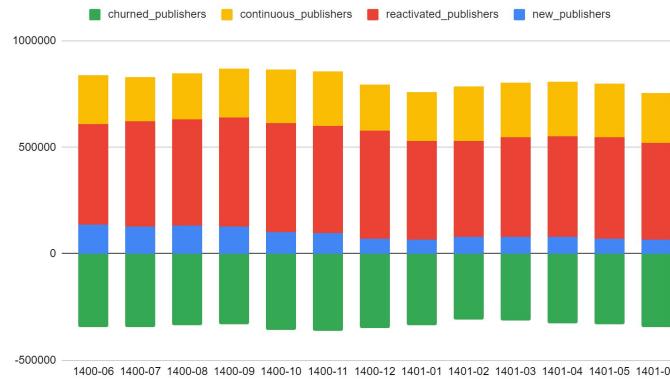
## MRR Analysis

## Retention Calculation

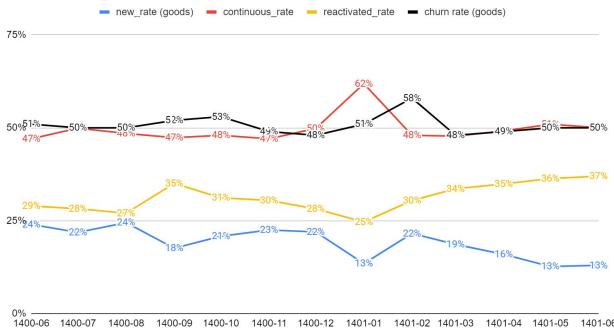
Goods



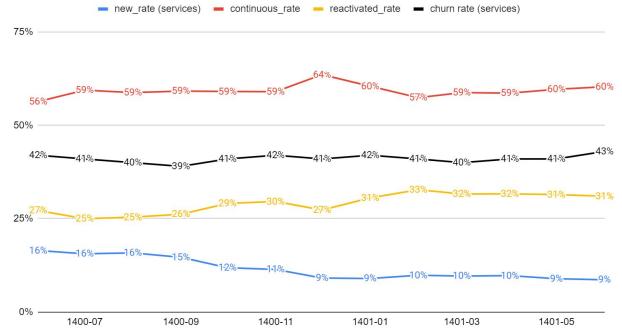
Services



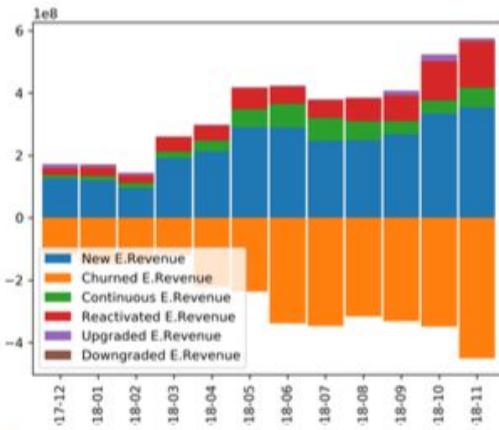
Goods



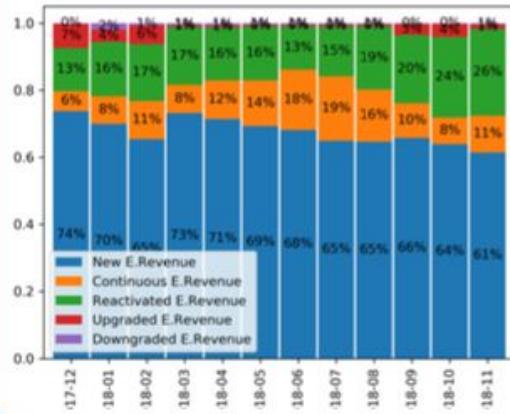
Services



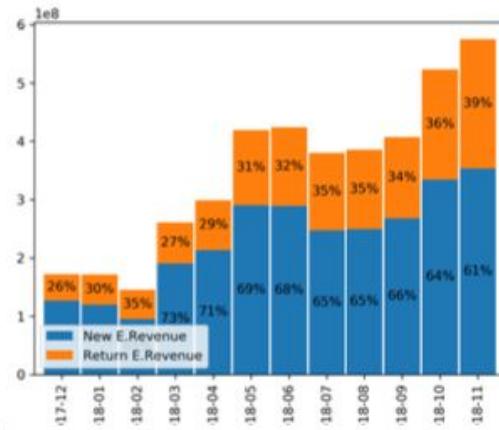
## MRR Components



## MRR Components Share



## New vs. return MRR



# Retention Calculation

Metrics & Models

Mahdi Nasseri

[mahdi.nasseri@gmail.com](mailto:mahdi.nasseri@gmail.com)

Linkedin: [mahdinasseri](#)

Telegram: [@mnasseri](#)

