

Retention Analysis

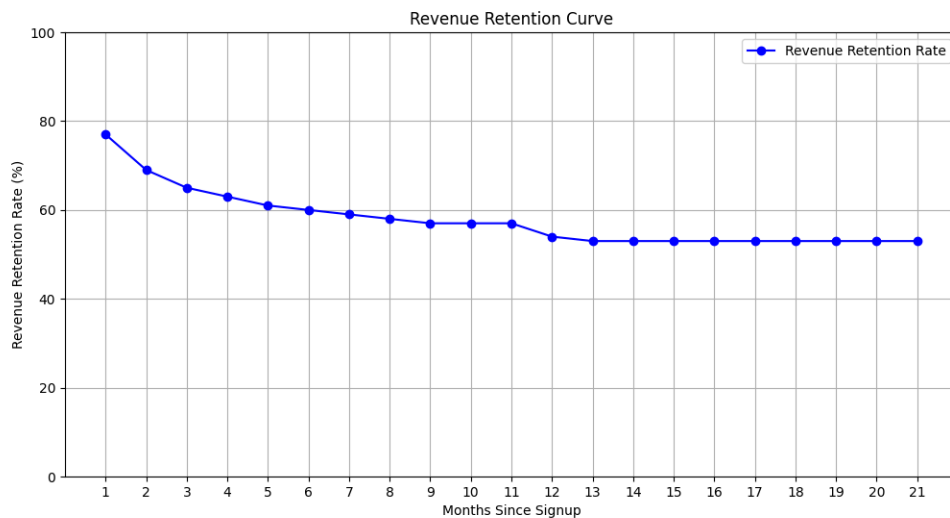
Data cleaning

Initially, the data revealed several issues such as OID duplicates, inconsistent country names, incorrect cancellation date formats, and missing MRR values. After addressing these, I added features like MRR for canceled consumers, geographic regions for countries, and a free trial customer indicator by checking if their conversion date matched the start date. These enhancements provide more ways to cut the data for further analysis.

Preliminary trend analysis with customer and revenue retention curves (Figures 1a. + 1b.)

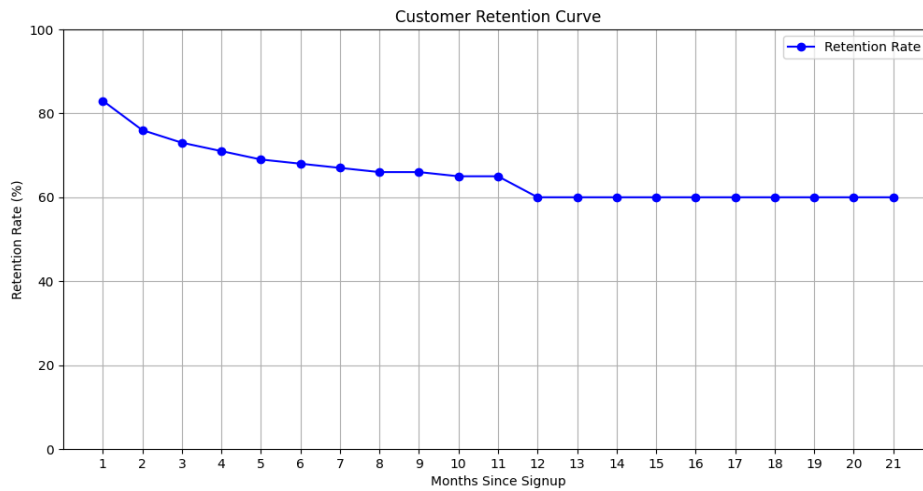
I created a heat map and retention curve for both customer and revenue retention. The curves reveal that, like most subscription-based products, the app experiences a significant drop in active customers and revenue in the first two months. Interestingly, there's a smaller dip around the twelve month mark, indicating two key retention barriers: the initial two months and one year in. This year-long dip could be due to consumers canceling after an annual subscription. The flat curves in both revenue and retention suggest minimal upselling, as retained revenue doesn't increase compared to retained customers. Despite this, the customer retention curve flattens at around 60%, indicating the app's relative health and stickiness after the first year.

Figure 1a.



Cont. (graphs on next page)

Figure 1b.



Cohort based customer and revenue heat map analysis (Figures 2a. + 2b.)

Diving deeper, the heat maps for both customer and revenue retention reinforce the story seen in the retention curves. The largest retention drop-offs occur in the first two months and at the twelve-month mark, underscoring the initial speed bump and later stickiness. Beyond these periods, retention is quite strong. Lost revenue/customer heat maps (figure 2c. and 2d. in appendix) reveal that while later cohorts experienced greater first-month losses in users and revenue, these losses were cushioned by new customer acquisition, resulting in no dramatic drop in retention percentages. Overall, all cohorts exhibited similar retention trends across both revenue and customer metrics.

Figure 2a.

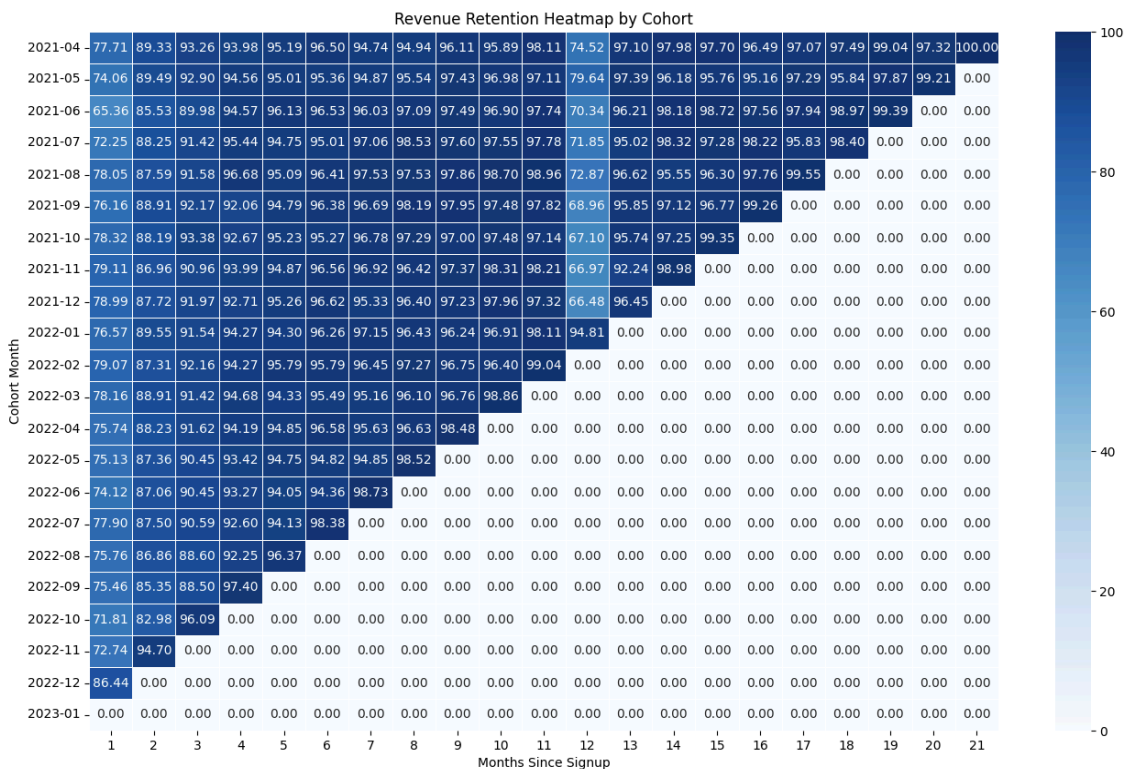
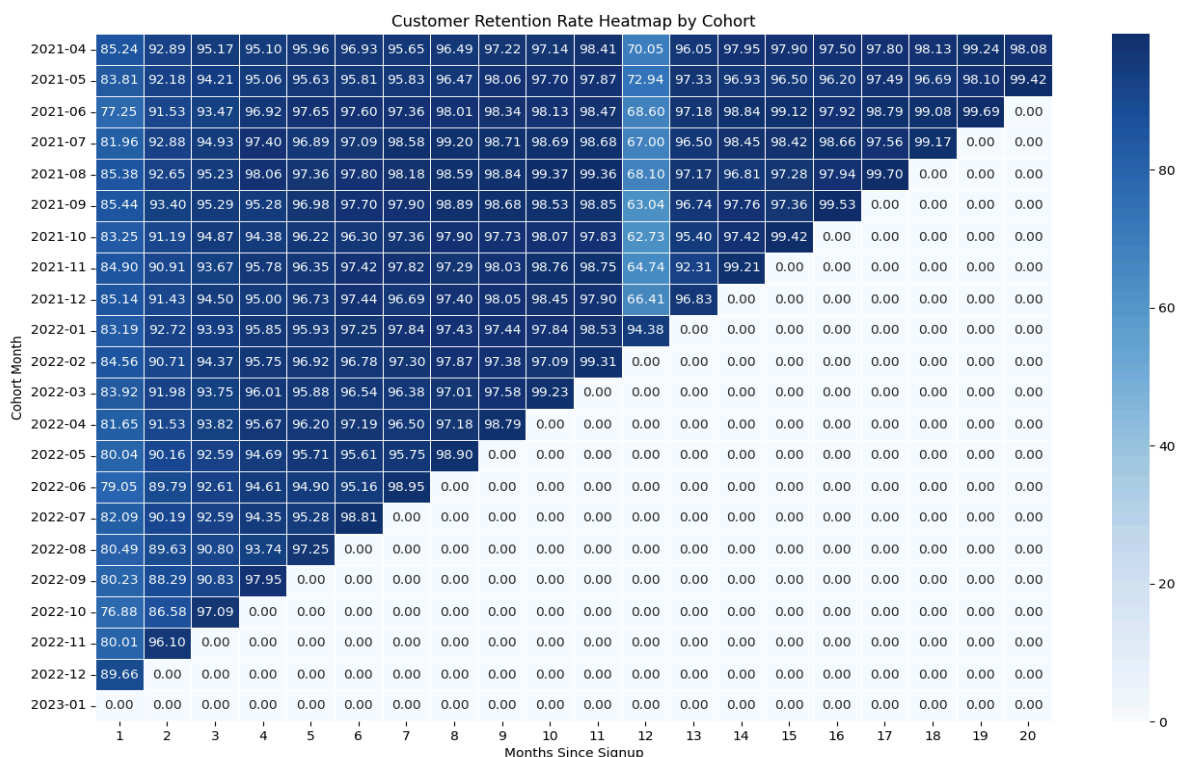


Figure 2b.



Taking a deeper look at the data: Cutting by geographical region, provider and free trial (Figures 3a. + 3b. + 3c. + 3d. + 3e.)

While understanding overall trends is helpful, examining different cuts of the data can provide more nuanced insights. Geographically, North America dominates both revenue and customer retention, which is expected. Interestingly, the Middle East outperforms all other regions except North America. Although the margin is small, it would be valuable to investigate the campaigns or app attributes driving this success in the Middle East. These insights could inform adjustments to campaigns in larger markets like Asia and Europe to boost their retention and revenue rates.

When analyzing data by providers, Stripe clearly outperforms Apple and Google in customer retention. However, the gap between Stripe and Apple narrows for revenue retention. Notably, Apple experiences a drop at the one-year mark not seen with Google or Stripe, suggesting a possible annual subscription deal exclusive to Apple causing churn. Having more business via Stripe is beneficial due to lower commission rates compared to the App Store, but it's important to confirm if the revenue data is pre- or post-commission.

Examining the free trial data, customers who converted from a free trial showed much higher retention rates. However, for accuracy, I did not recalculate all free trial entries by considering the cancellation date minus the conversion date. Ideally, non-free trial data should calculate months from the start date, while free trials should be from the conversion date. Thus, while free trials appear more effective, this finding should guide further exploration rather than be a definitive conclusion.

Figure 3a.

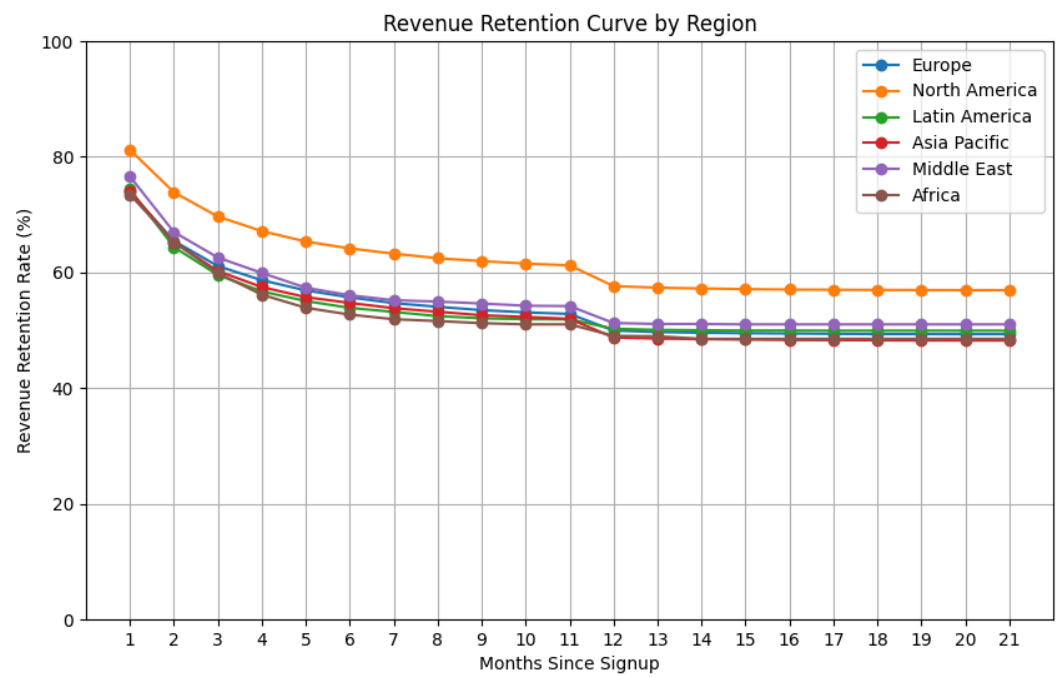


Figure 3b.

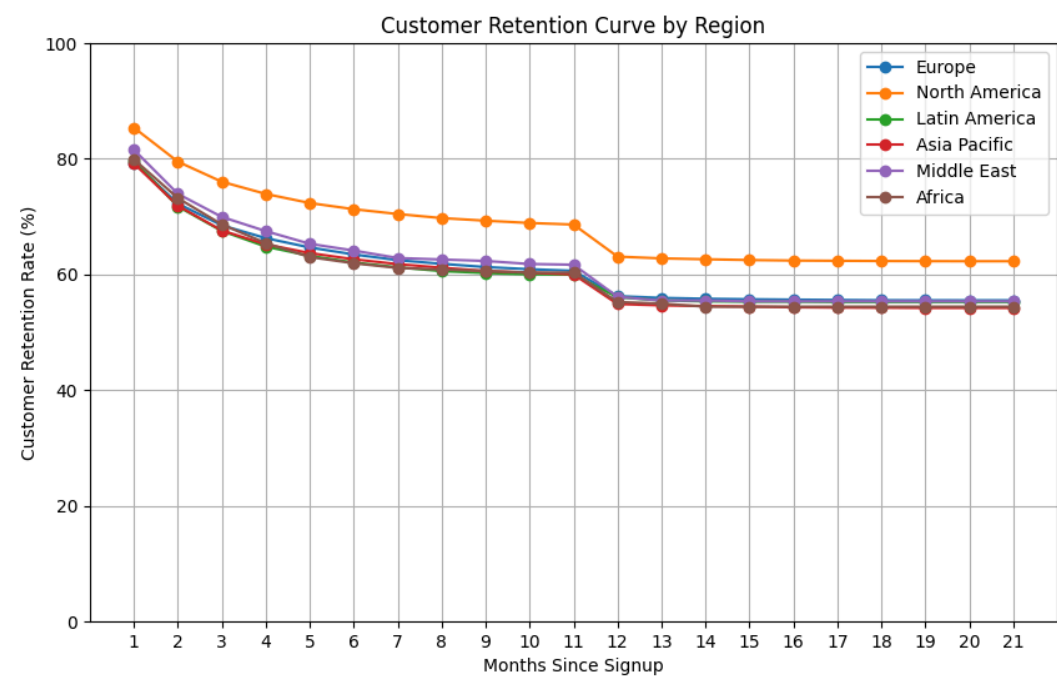


Figure 3c.

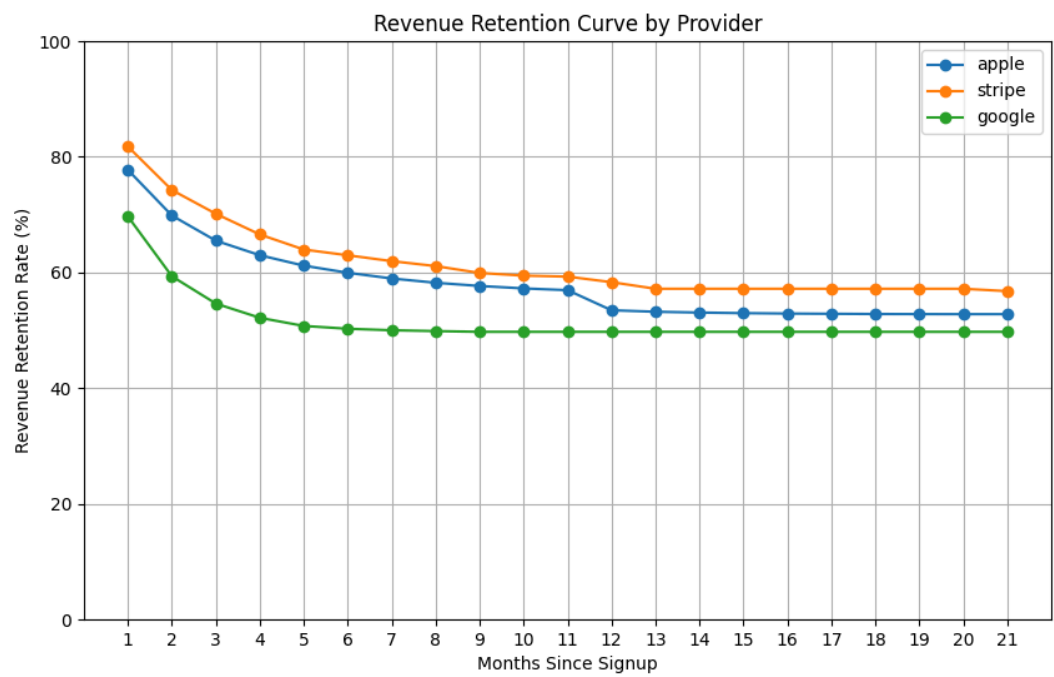


Figure 3d.

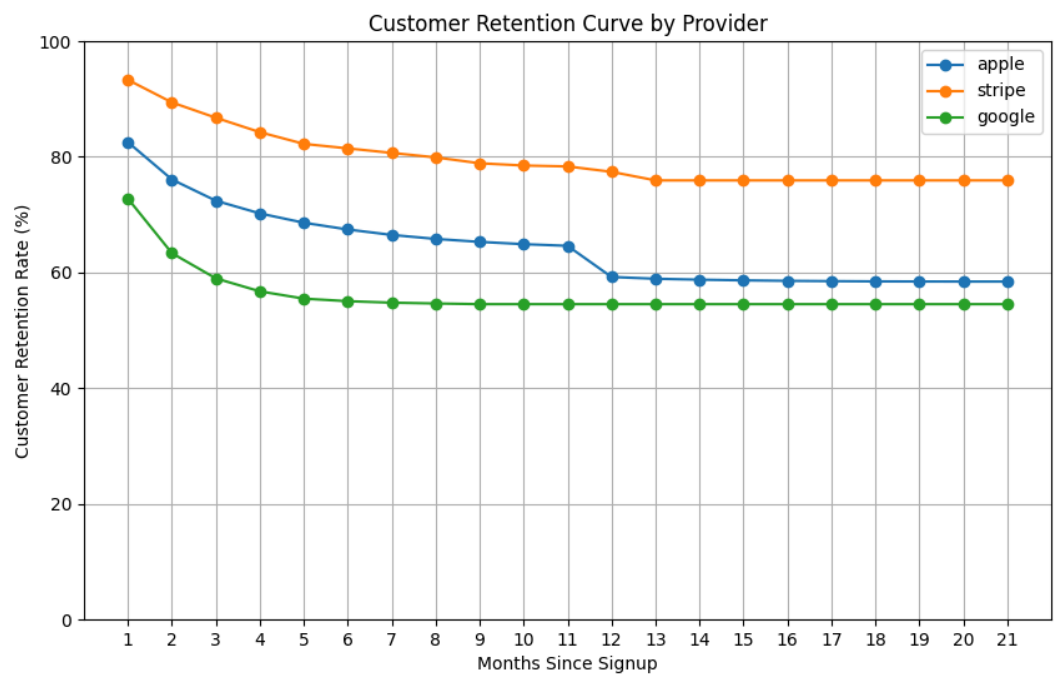


Figure 3e.

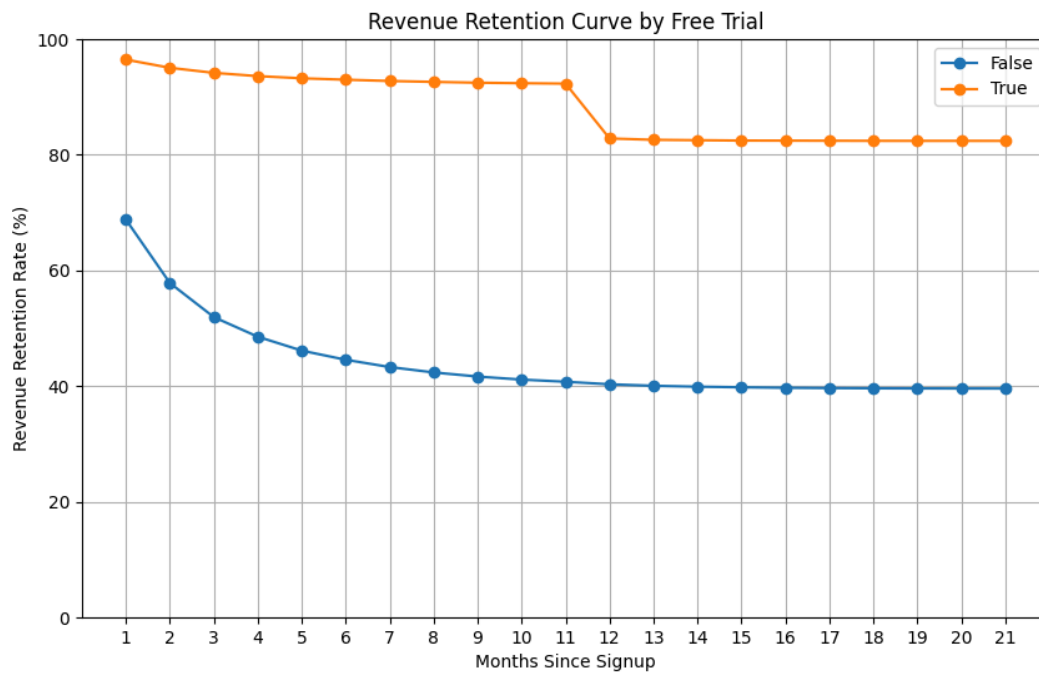
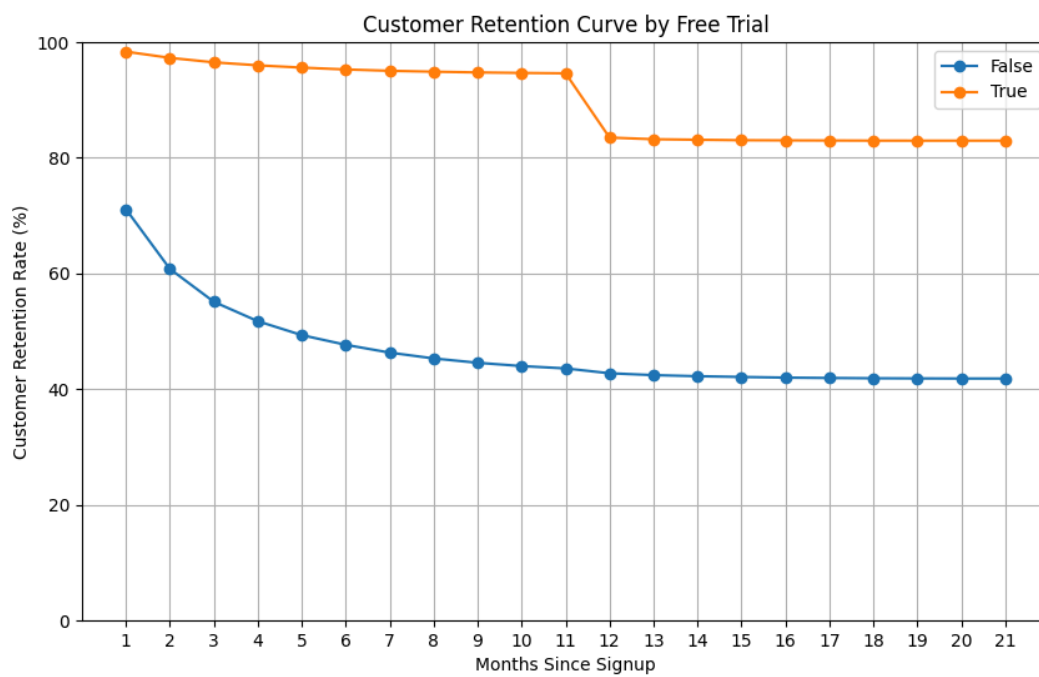


Figure 3f.



Other areas analysts should explore

The data analyzed provides the current monthly charge but lacks detailed month-to-month payment breakdowns for each customer. Having this information would enable us to draw more robust conclusions about the app's ability to upsell customers. Additionally, understanding the terms of free trials by region could offer valuable insights into their effectiveness. Finally, access to past campaign schedules and promotions would allow us to cross-check campaign results with the cohort-based heat map analysis to evaluate campaign performance.

Conclusion

The retention curve, while not a "smile curve," remains a positive signal as it remains flat with a relatively high bottom-out retention percentage. Based on our assumptions, we observe that revenue retention consistently lags behind customer retention in all cuts of data, suggesting a lack of upsell capitalization. The data however, does indicate that the app has potential and becomes quite sticky after a year. It would be helpful to have longer term data to see if this trend of retention holds after two plus years. Future efforts to improve retention for the app should focus on targeting large markets like Europe and Asia, better managing promotional campaigns, and enhancing upselling strategies to existing customers.

Note: All graphs related to figures 1 and 2 are located in "Retention Analysis.py", figure 3 is generated from "Retention Analysis Second Cut.py"

You can find the appendix with more graphs and tables on the next page

Appendix

Figure 1c.

Revenue Retention Table			
Month	Lost Revenue	Remaining Revenue	Retention Rate (%)
1	119543	410034	77%
2	42538	367495	69%
3	23103	344392	65%
4	13396	330996	63%
5	9490	321506	61%
6	6334	315172	60%
7	5119	310053	59%
8	3697	306356	58%
9	2899	303457	57%
10	2124	301333	57%
11	1504	299829	57%
12	16106	283723	54%
13	1587	282136	53%
14	641	281496	53%
15	457	281039	53%
16	312	280727	53%
17	199	280527	53%
18	161	280367	53%
19	66	280300	53%
20	46	280254	53%
21	105	280149	53%

Figure 1d.

Customer Retention Table			
Month	Users Lost	Users Retained	Retention Rate (%)
1	13860	66890	83%
2	5191	61699	76%
3	2937	58762	73%
4	1763	56999	71%
5	1283	55716	69%
6	912	54804	68%
7	735	54069	67%
8	534	53535	66%
9	412	53123	66%
10	307	52816	65%
11	223	52593	65%
12	3797	48796	60%
13	300	48496	60%
14	111	48385	60%
15	83	48302	60%
16	59	48243	60%
17	35	48208	60%
18	29	48179	60%
19	13	48166	60%
20	8	48158	60%
21	0	48158	60%

Figure 2c.

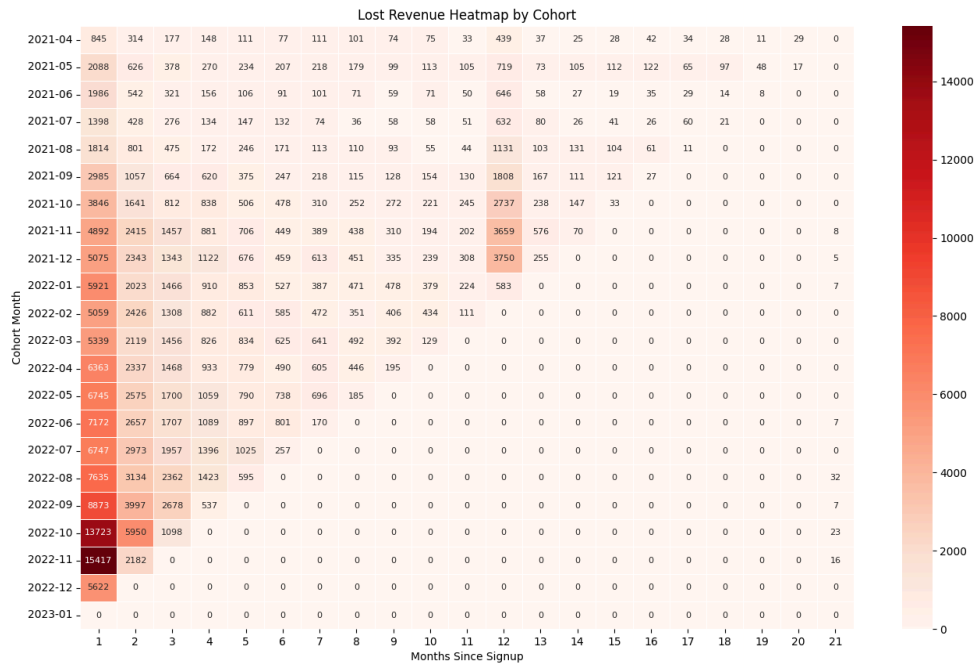
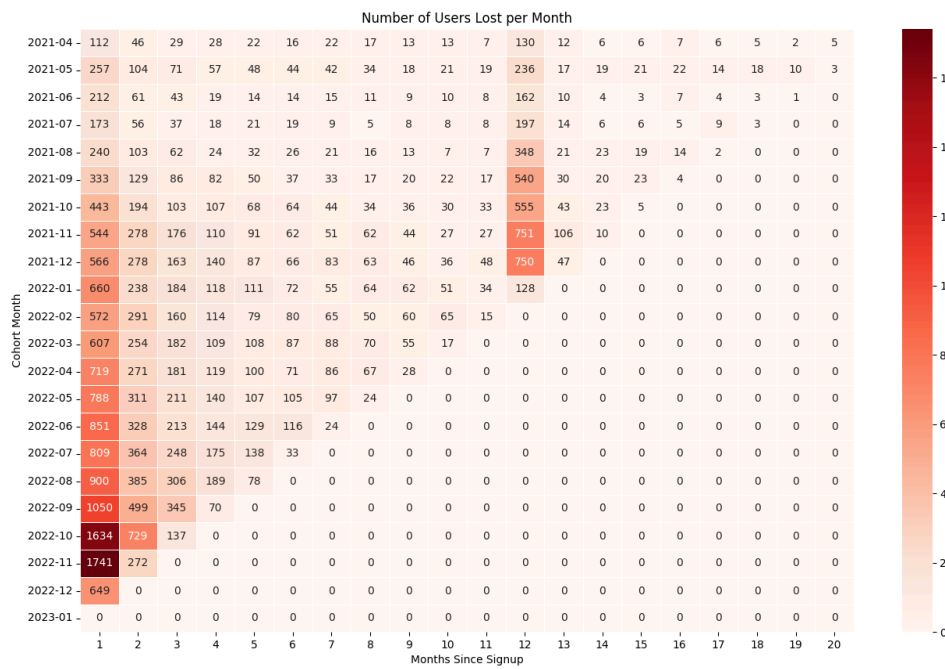


Figure 2d.



Tables for Figure 3 graphs

Aggregated Customer Retention Table by Region

Month	Europe Retention Rate (%)	North America Retention Rate (%)	Latin America Retention Rate (%)	Asia Pacific Retention Rate (%)	Middle East Retention Rate (%)	Africa Retention Rate (%)
1	79%	85%	80%	79%	82%	80%
2	72%	79%	72%	72%	74%	73%
3	68%	76%	68%	68%	70%	69%
4	66%	74%	65%	65%	67%	65%
5	65%	72%	63%	64%	65%	63%
6	63%	71%	62%	63%	64%	62%
7	62%	70%	61%	62%	63%	61%
8	62%	70%	61%	61%	63%	61%
9	61%	69%	60%	61%	62%	61%
10	61%	69%	60%	60%	62%	60%
11	61%	69%	60%	60%	62%	60%
12	56%	63%	56%	55%	56%	55%
13	56%	63%	56%	55%	55%	55%
14	56%	63%	55%	55%	55%	54%
15	56%	62%	55%	54%	55%	54%
16	56%	62%	55%	54%	55%	54%
17	56%	62%	55%	54%	55%	54%
18	56%	62%	55%	54%	55%	54%
19	56%	62%	55%	54%	55%	54%
20	56%	62%	55%	54%	55%	54%
21	56%	62%	55%	54%	55%	54%

Aggregated Revenue Retention Table by Region

Month	Europe Retention Rate (%)	North America Retention Rate (%)	Latin America Retention Rate (%)	Asia Pacific Retention Rate (%)	Middle East Retention Rate (%)	Africa Retention Rate (%)
1	74%	81%	74%	74%	77%	73%
2	65%	74%	64%	65%	67%	65%
3	61%	70%	60%	60%	63%	60%
4	59%	67%	57%	57%	60%	56%
5	57%	65%	55%	56%	57%	54%
6	56%	64%	54%	55%	56%	53%
7	55%	63%	53%	54%	55%	52%
8	54%	62%	52%	53%	55%	52%
9	53%	62%	52%	53%	55%	51%
10	53%	62%	52%	52%	54%	51%
11	53%	61%	52%	52%	54%	51%
12	50%	58%	50%	49%	51%	49%
13	50%	57%	50%	49%	51%	49%
14	50%	57%	50%	48%	51%	49%
15	49%	57%	50%	48%	51%	49%
16	49%	57%	50%	48%	51%	49%
17	49%	57%	50%	48%	51%	49%
18	49%	57%	50%	48%	51%	49%
19	49%	57%	50%	48%	51%	49%
20	49%	57%	50%	48%	51%	49%
21	49%	57%	50%	48%	51%	49%

Cont.

Aggregated Customer Retention Table by Provider

Month	apple Retention Rate (%)	stripe Retention Rate (%)	google Retention Rate (%)
1	83%	93%	73%
2	76%	89%	63%
3	72%	87%	59%
4	70%	84%	57%
5	69%	82%	55%
6	67%	81%	55%
7	66%	81%	55%
8	66%	80%	55%
9	65%	79%	55%
10	65%	78%	55%
11	65%	78%	55%
12	59%	77%	55%
13	59%	76%	55%
14	59%	76%	55%
15	59%	76%	55%
16	59%	76%	55%
17	58%	76%	55%
18	58%	76%	55%
19	58%	76%	55%
20	58%	76%	55%
21	58%	76%	55%

Aggregated Revenue Retention Table by Provider

Month	apple Retention Rate (%)	stripe Retention Rate (%)	google Retention Rate (%)
1	78%	82%	70%
2	70%	74%	59%
3	65%	70%	55%
4	63%	67%	52%
5	61%	64%	51%
6	60%	63%	50%
7	59%	62%	50%
8	58%	61%	50%
9	58%	60%	50%
10	57%	59%	50%
11	57%	59%	50%
12	53%	58%	50%
13	53%	57%	50%
14	53%	57%	50%
15	53%	57%	50%
16	53%	57%	50%
17	53%	57%	50%
18	53%	57%	50%
19	53%	57%	50%
20	53%	57%	50%
21	53%	57%	50%

Cont.

Aggregated Customer Retention Table by Free Trial

Month	False Retention Rate (%)	True Retention Rate (%)
1	71%	98%
2	61%	97%
3	55%	97%
4	52%	96%
5	49%	96%
6	48%	95%
7	46%	95%
8	45%	95%
9	45%	95%
10	44%	95%
11	44%	95%
12	43%	83%
13	42%	83%
14	42%	83%
15	42%	83%
16	42%	83%
17	42%	83%
18	42%	83%
19	42%	83%
20	42%	83%
21	42%	83%

Aggregated Revenue Retention Table by Free Trial

Month	False Retention Rate (%)	True Retention Rate (%)
1	69%	96%
2	58%	95%
3	52%	94%
4	49%	94%
5	46%	93%
6	45%	93%
7	43%	93%
8	42%	93%
9	42%	92%
10	41%	92%
11	41%	92%
12	40%	83%
13	40%	83%
14	40%	83%
15	40%	82%
16	40%	82%
17	40%	82%
18	40%	82%
19	40%	82%
20	40%	82%
21	40%	82%

End.