

In the fiercely competitive gaming world, every second matters in the battle for players' attention and retention. Since time is of essence, it's vital for your product analysis and measurement to be focused on the right metrics that allow you to properly analyze and understand your players' behavior.

Your top traffic sources for players, number of DAUs and MAUs and other KPIs are still important but they are descriptive, giving you a one-dimensional perspective of your players rather than a more complete picture of the customer journey. Although these metrics are important, the sooner your business moves beyond these one-dimensional metrics, the faster your business will grow.



Time-series analytics, which measure a series of player action over time, can take your player behavioral analysis a step further. You'll discover player behavioral profiles such as your whales, players likely to be top tier, first time depositors, and bonus abusers and start to learn how to optimize your marketing and product for each type of player.

Of course, you'll still need to constantly monitor top-level metric KPIs and metrics such as MAUs, DAUs, and LTV for different segments. An overview dashboard that covers all the main metrics provides a snapshot of the overall performance including the number of current players of different segments, global conversion rates, top traffic sources and regions and much more.





Although we may feel we live in a world of senseless data output where player behavior is analyzed obsessively, the crucial business questions remain constant:

- ♦ Which players have the highest LTV and what are their common characteristics?
- Why do some players have a higher probability of becoming active whales while others stay demo players for what seems like forever?
- What makes players finally deposit money into their account?

Time-series analytics with data stored over an infinite amount of time will give answers to these crucial business questions, along with a clear and accurate understanding of player behavior, even those single session visitors who visited your site once upon a time.



What You Need to Know Before Going to the Next Level:



New and exciting games are constantly vying for the attention of players; how will your gaming company compete? It's all about dwell time and successfully convincing players to spend more time on your platform.



Time-series analytics give you the best answers to your business questions about player behavior, which is important, as they are your most valuable asset.



This ebook presents you with the digital intelligence to leverage these insights and grow your business by driving player engagement and monetization.



Even though you're continuously monitoring your conversion, you want to make sure you're exploring it from every possible angle. Your conversion dashboard can assist you by displaying metrics such as the average number of days players take from registration to their first time deposit (FTD), the average FTD, and your global conversion rate.



Conversion Cycle; Registration to FTD (Timeless)
The length of conversion cycle, since launch
3.59 Days



Conversion Cycle; Registration to FTD (Period)
The length of conversion cycle in defined period
1.04 Days



Average FTD amount
The average first deposit amount (Timeless)
22.64 \$

Daily Conversion Rate - (measuring global conversion)



A traditional conversion rate measures the conversion between two steps in the funnel. The global conversion rate measures the conversion between the very first step in the upper funnel to the last step of the conversion (e.g. from signup to deposit).



ADDING THE DIMENSION OF TIME TO YOUR CONVERSION FUNNEL ANALYSIS



Typical conversion funnels analyze your players' progress through defined steps towards a specific goal. One of the major advantages of time-series analytics is the ability to define the conversion funnel scope, both according to the steps taken to reach the conversion as well as the timeframe itself. Now imagine being able to combine your analysis of the steps a player takes before conversion within a particular timeframe, or a conversion funnel. This funnel can be quickly changed according to whatever steps operators wish to analyze without the need for a data scientist. The raw data and user level allows you to export any list of players in any part of the funnel in order to discover insights on that segment.

With the ability to analyze the different levels players complete over a period of time, you might realize that gamers that complete levels faster are more likely to convert and become paying players.

Lifetime Conversion Funnel Analysis United States United Kingdom Brazil **OpenBuyPanel** Sign_Up Deposit 7,887 1,036 276 Since each user has its own ID, you can drill down to the behavior of specific users during a shorter timeframe to better understand their behavior. 220 1,591 United States United King... 20.17% 21.24% 28.62% 3.27% 1.36% 0.00% Brazil



Behavioral funnel analysis examines the series of steps players take before converting. For example, players may register and make a deposit before finally playing their first game. Understanding these conversion paths can enable gaming operators to better monetize.



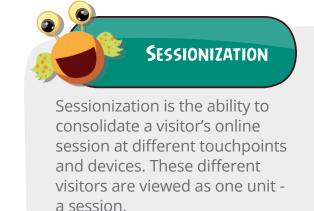
Multi-dimensional funnel analysis sheds light on these types of complex business questions:

- ♦ How many tutorial steps do your players complete? What about your high-value players?
- **Provided State 1** Do players abandon the game when their account is full or empty? The answers could indicate an unbalanced economy.
- **Proof** Do players abandon the game following a difficult battle or after a specific level?
- What is the most followed path that led to a certain deposit sum?

If you want to investigate what kinds of routes your players take, where they get stuck, and how long specific steps take for example, you'll need to examine your player's path via a single session. You'll also need a system which is able to perform sessionization.

sign up Start buy process 11,697 Deposit 1,051

The data for the conversion funnel needs to be as accurate as possible, which is why measuring single session conversion is so critical. Players who convert in a single session exhibit different behavior patterns than players over several different sessions. They are also likely to behave in this manner for the entire game lifetime.





What You Need to Know Before Going to the Next Level:



Traditional conversion funnel analysis doesn't account for the dimension of time. That's why you need multi-dimensional funnel analysis.



The conversion path of single-session players must be analyzed differently from players who engaged over a period of time.



Advanced behavioral analytics can answer your complex questions about player behavior.

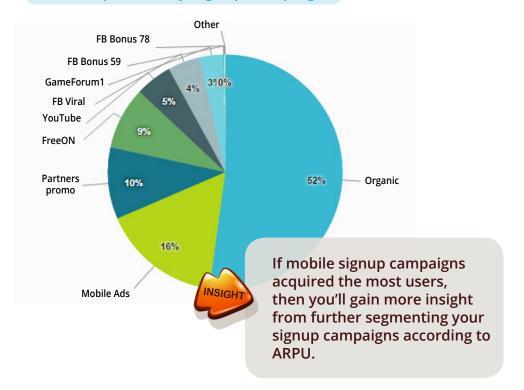




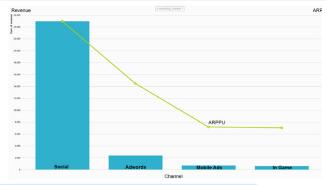
A successful marketing campaign does not end when players click and install the game. The most successful campaigns are the ones that yield higher retention rates and higher conversion rates paying users.

With integrated campaign data from different sources, we can analyze marketing success and campaign ROI, revenue and ARPU that was gained from each channel.

User Acquisition by Signup Campaign



Daily Total Revenue by Signup Marketing Channel



Retention by Signup Campaign

	•		
By signup campaign	Users	1	2
FB Bonus Day	647	16.4%	6.0%
YouTube Viral	220	20.9%	5.5%
Gamalytics	204	6.9%	0.5%
Adsmob 855	121	17.4%	4.1%
Partners promo	107	21.5%	5.6%
Social Prize 28	63	39.7%	4.8%
TVV nightowl	55	16.4%	5.5%
CRM mail rec	41	12.2%	4.9%

Cohort analysis reveals which campaign was most successful in bringing players back to play the day after first sign-up.



Once you've gained a greater understanding of your player types, their behavior, and the steps they take towards conversions, it's time to see a more complete picture of how these behaviors lead to revenue.

First, take a quick glance at your behavior revenue dashboard for important metrics such as LTV per player (and paying player) and average player deposit amount. You'll also see important KPIs such as GGR (gross gaming revenues), ARPU, average active days, player turnover, wins and jackpots. These metrics are combined into one table to give you a high-level understanding of your player behavior. From here you can drill down deeper for a clearer picture.





LTV amount Paying user (gs)
Timeless LTV
112.85 \$



Deposits amount (gs)
Deposits in period
71,887.61 \$



LTV, or lifetime value, is a measurement of the total revenue a player will bring to your gaming company during his lifetime as a paying customer.

Monthly Revenue KPI

Paying users Average who used the Average Revenue Total bets in **Gross Gaming** Total Turnover product (at least) Revenue Per Days of Per Paying Total days Revenue game currency Deposits once in the given per Active User \$ activity per User \$ Sum of wins \$ (points, coins..) of activity timeframe amount \$ Users user **GGR ARPU ARPPU Active Days** Turnover Active Users Davs of Turnover per Revenue Deposits Paying Users Activity Player per User 136,172 2,289,867 1.08 93.97 456,977 66,298 6.89 34.54 71,888 2,497 765



Once we identify and understand the behavior of top spenders, we can act on these players' behavior to encourage even more spending.



Acquiring players, especially high value players, is just the first step in growing your gaming platform. If you want to set your business apart from the others, you'll have to learn how best to fight churn and optimize your marketing campaigns. In other words, you'll need a solid retention strategy.



What You Need to Know Before Going to the Next Level:



To optimize your marketing channels, you'll first need a general understanding of what is going on. Later you can drill further according to signup channel, marketing campaigns, and levels of ARPU.



The revenue dashboard can give you an understanding of your player behavior at a quick glance, as well as important KPIs such as ARPU, GGR, LTV, average activity, wins and jackpots.



LTV is one of your most important KPIs and should be constantly monitored.



Declare Victory by Mastering Retention & Optimization

Gaming companies with the most engagement over the longest period of time are the ones who have an edge. To compete in this competitive landscape, you'll need the analytic tools to understand your player behavior and use it as a foundation to build your retention strategy. This can be done by taking a look at the global churn or retention of players according to the number of days, weeks, or any other period of time.

Global Retention by Signup Marketing Campaign

Byln the day of	Users	0	1	2	3	4	5	6	7	8	9
FB Bonus Day	41,660	96.8%	50.5%	46.8%	43.1%	37.6%	29.4%	24.2%	23.7%	22.6%	21.7%
YouTube Viral	23,787	100.0%	46.5%	43.9%	42.8%	41.4%	40.8%	39.9%	40.8%	39.7%	39.3%
Gamalytics	12,345	100.0%	37.3%	31.6%	29.3%	26.6%	25.7%	25.1%	24.4%	23.2%	22.1%
Adsmob 855	8,363	100.0%	48.4%	45.4%	44.2%	43.0%	41.7%	42.3%	42.6%	41.3%	40.6%
Partners promo	6,177	100.0%	47.8%	45.4%	44.0%	42.0%	40.8%	41.3%	40.9%	39.6%	39.0%
Social Prize 28	5,570	100.0%	45.6%	44.3%	42.5%	41.3%	40.5%	40.7% The bigs	40.7%	39.6%	39.0%
ΓVV nightowl	808	100.0%	54.6%	51.7%	50.6%	48.8%	∼ 5%	45.8%	47.4%	in reten	
CRM mail rec	282		46.1%	47.9%	42.6%	42.6%	INSIGHT		4 5 3 70	er a play	39.770
Adsmob 944	137		50.4%	49.6%	44.5%	40.9%		4 UEU /0		engaged	
FB Bonus Day Fri	76		40.8%	32.9%	35.5%	35.5%	39.5%	more iik	ely to be	come lor	igtime
FB Bonus Day Sun	18			38.9%	38.9%	38.9%					
TVV NotKids	13			15.4%	23.1%		15.4%			15.4%	7.7%





What You Need to Know Before Going to the Next Level:



Cohort analysis can give you insights into the actions of a specific group of players over a period of time.



Cohort analysis can also help you discover how players reacted to a certain event.



Most players in the gaming industry arrive at your site once and leave without a trace. Whether the player churned due to disinterest, a bad experience, or targeting him with the wrong marketing campaign, the company lost money on that user. The good news is that if you're willing to invest in identifying the players that churn and learning more about their behavior, you can quickly bring results.

Again, first you'll need to gain a general understanding of the trends of your player attrition and retention with cohort analysis. Later, you can analyze the events that led up to a particular player moment, such as a deposit or a signup with reverse cohort analysis.

Cohort Analysis: App Launches by App Install Days Cohorts

Date of app install						Days after download				
C	ohort size	1	2	3	4	5	6	7	8	
January 2012	82,310	3.6	4.9	5.1	4.9	5.0	4.7	4.9	5.0	
February 2012	64,489	2.8	4.4	4.5	4.4	4.4	4.3	4.3	4.1	
March 2012	84,535	2.7	4.5	4,5	4.4	4.3	4.3	4.2	4.1	
April 2012	59,286	2.9	5.0	4.5	4.7	4.5	4.3	4.1	3.8	
May 2012	74,978	2.9	4.6	4.7	4.7	4.6	4.5	4.0	3.9	
June 2012	75,815	2.6	4.4	4.4	4.3	4.4	3.9	3.8	- N	_
July 2012	69,680	3.1	5.0	4.8	4.5	4.3	4.1			_
August 2012	57,530	2.6	4.6	4.4	4.2	4.2	-	INIO	► • • • • • • • • • • • • • • • • • • •	la
September 2012	73,316	2.9	4.6	4.5	4.3	-	-	INSIGHT	- al	
October 2012	76,471	2.2	4.4	4.5					🖊 d	U
November 2012	94,438	2.9	5.4	-	-	-			u	n
December 2012	124.004	3.1	-						u	

November 3nd had the highest percentage of app installs. March 9th, April 8th and June 7th had the lowest. Drillling down further with reverse cohort analysis can help you understand why players responded the way they did.

Reverse Cohort Analysis: Examining Actions in Days Prior to Deposit

Users who did	deposit	having fire	st done done	by days pri	ior, counted	in each buc	ket				
In the day of	Users	0	1	2	3	4	5	6	7	8	
2016-05-29	104	41.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
2016-05-30	82	45.1%	54.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
2016-05-31	55	36.4%	52.7%	45.5%	0.0%	0.0%	0.0%	0.0%	0.0%	INSIGH	
2016-06-01	59	42.4%	49.2%	59.3%	50.8%	0.0%	0.0%	0.0%	0.0%	Wolgh	5
2016-06-02	47	44.7%	53.2%	42.6%	46.8%	40.4%	0.0%	0.0%	0.0%	0.0%	
2016-06-03	61	41.0%	45.9%	34.4%	41.0%	39.3%	34.4%	0.0%	0.0%	0.0%	
2016-06-04	46	41.3%	47.8%	45.7%	45.7%	47.8%	45.7%	34.8%	0.0%	0.0%	
2016-06-05	43	44.2%	37.2%	32.6%	30.2%	27.9%	37.2%	25.6%	37.2%	0.0%	
2016-06-06	39	41.0%	43.6%	33.3%	35.9%	38.5%	30.8%	25.6%	35.9%	33.3%	
2016-06-07	41	34.1%	46.3%	34.1%	36.6%	31.7%	39.0%	36.6%	39.0%	34.1%	

This reverse cohort shows which players had a game event (such as spin or claim reward) on the same day as their first deposit. We can see that around 40% of them had a game event on the same day as their deposit. Even more interesting is the high percentage that had a game event occur 2 days before and even 10 days before they played the game.



Reverse cohort analysis examines player behavior or action in the past, starting with a particular event. Out of the players who purchased a game, for instance, how many of these players clicked on a campaign the days before the campaign was targeted to paid players?



SINGLE SESSION VISITORS (SSVS)



SSVs are another way of describing your churned visitors, but with a twist: they've only completed one session with your game.

The ability to identify and predict which accounts will only play for a single session can contribute significantly to a company's bottom line. Some of the indicators of SSVs are: a session length of less than 5 minutes; a bad experience; and accounts who signed up more than 3 months ago but less than 6.



What You Need to Know Before Going to the Next Level:

Reverse cohort analysis can be used to answer the effects of player behavior on past events, such as:



If players withdrew money on a specific day because of deals closed in the days prior.



The correlation between different player actions (such as signups or deposits) and player purchase of the game.



If revenues have increased as a result of your updated deposit process.



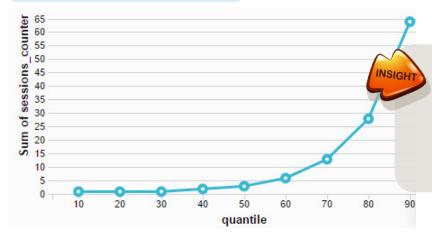
In the gaming industry, player history repeats itself. By analyzing players' past behavior, such as visitor frequency and sessions over time, we can reveal behavioral patterns that can translate into revenue. The first step in identifying behavior over time is examining player frequency, either in terms of visits or sessions during a period of time.

Player Visit Frequency



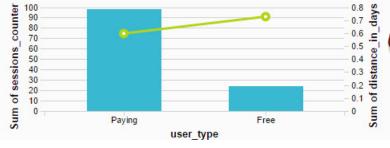
By segmenting players per visit frequency we can learn a lot about game stickiness during this time period. For instance, during this time period, multiple monthly and multiple daily players had the same number of visits.

Session Frequency Per User



Measuring player sessions according to quantiles, rather than averages, is a more accurate measurement because it is less susceptible to outliers. For example, we see that during this specific time period 40% of players (those in quantile 60) had fewer than 6 visits (quantile 50 is the median).

Once we understand more about player frequency, we can compare the behavior of different types of players. For instance, we can compare the frequency of paying players and free players and show the relationship between them.



INSIGHT

We see that paying players not only have more sessions, but visit more often (the time between days, or "distance" they visit is lower). This shows a strong relationship between frequency and the LTV of paying players.



To discover your player's behavioral patterns and learn from them, you'll need to use behavioral path analysis. The sunburst visualization is the best way to display behavioral path analysis. Here we analyze a series of steps players completed. In this case these steps show all the different paths that end with the player leaving the game room and not making a purchase.

Unlike funnel analysis, which relies on predefined assumptions, advanced behavioral path analysis allows you to define your players' path using a range of options. The range and flexibility of behavioral queries include but are not limited to: ending the login process, entering the game room, leaving the game room, accepting a bonus, depositing, collecting a win. All of these queries can be done within a chosen timeframe.

Path Analysis - (the first steps of players who pressed "buy" and didn't purchase)



The CQL behind path analysis

```
1 select path_to_string(path) pth , path_count() , count(*) counter --date(session_start_time()) as dt
2 from cooladata
  where date range(context)
                                                     We can define the behavioral
  and filters(context)
                                                     path scope to include players in
  CLUSTER PATH BY session remove duplicates
                                                     a particular timeframe and single
         event name="OpenBuyPanel" *1+ times
                                                     session. Examining the path of
  ENDING with event name="LeaveRoom"
                                                      players who opened a buy panel
  group by 1,2 order by 3 desc
                                                     but didn't end up purchasing in
9 limit 10
                                                     a single session allows a more
                                                     focused and accurate analysis.
```

Now let's focus on a few specific behavioral profiles of players and show how we can use behavioral analysis to solve complex challenges.

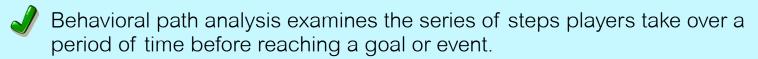


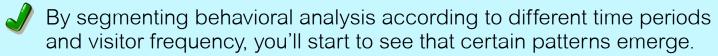


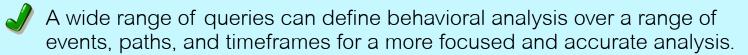
Behavioral path analysis examines the path, or multiple paths that players take to reach a specific event or goal. By analyzing the duration of each step in their path, we can analyze loyalty, churn and ROI.



What You Need to Know Before Going to the Next Level:









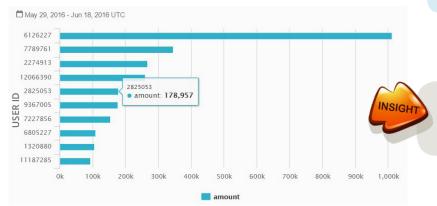
The ability to identify high performing players (whether playability or average spend) early on is vital to the success of any platform. For gaming platforms, conversion rates, FTD rates and amounts are particularly vital for certain player behavioral profiles, including: whales, FTDs (first-time depositors), LTTs (likely to be top tier), SSVs (single session visitors), and bonus abusers. The more gaming operators understand about these types of players, the greater their opportunity for monetization.

WHALES, THE BIG SPENDERS

Perhaps the most important gaming customer journey occurs in the first few steps of the behavioral profile of a whale (also known as VIPs). Although whales drive most of the revenue for gaming companies, they account for less than 3% of all mobile game players who make purchases. Since they are the top 10% of all in-game spenders, monitoring them from the moment they install the game to the time they play their first game can shed great light on their early behavior. For example, some mobile-game developers will try to "catch" whales early by convincing them to pay to play instead of waiting for a free turn.

One way of identifying your whales is by segmenting your top spenders, either during a specific period or since the time of your game's launch.





Top 10 spenders (Timeless, since game launch)

You can identify your top spenders either during a specific period or since the game was launched.

USER ID	Spent Amount
6126227	10108.98\$
7789761	3449.79\$
2274913	2679.85\$
12066390	2599.83\$
2825053	1789.57\$
9367005	1769.26\$
7227856	1551.78\$
6805227	1099.89\$
1320880	1049.89\$
11187285	939.91\$





Cohort Name	Users count	Jul	Aug
Whales	849	14%	75%
Dolphins	831	30%	60% INSIGHT
Minnows	601	47%	40%

A gaming company discovered that they had been losing money in the past three weeks. They wanted to know what had changed in player behavior, and why? They found that despite the decrease in revenue, the deposits of whales and dolphins (mid-tier players) had actually increased in the last month.

FTD's (FIRST-TIME DEPOSITORS)

A common KPI for online gaming companies is the FTD - first time deposit, a key "milestone" in the user journey that makes a player "hooked" on the game. Players who have made their first FTD are called FTDs, or first-time depositors.

Here are a few success stories where companies leveraged behavioral analytics to increase their revenue:



One gaming company discovered that players who win the first game are most likely to become FTDs. So for first-time game winners, they added a "test game" before the FTD in which the player always wins the first round. You can imagine the uplift!



Another company that implemented behavioral analytics found that a player who spends 6-times longer than average during the first visit has a higher probability to make a deposit. The company used this insight to incentivize these players to make a deposit by offering them upgraded status after entering the game during their second visit.

LTTS (LIKELY TO BE TOP TIER)



In most industries, the vast majority of the revenue is generated by a small group of players. In the gaming industry, where the average lifetime of a player is about 12 months, it can take a couple of months until a customer becomes a whale.

Here is the general rule to keep in mind with LTTs:

In online gaming, 95% of the revenues are generated by 5% of players. Understanding these behavioral profiles (and accurately predicting who will become a whale) is vital.



BONUS ABUSERS

A less popular, but unfortunately prevalent behavioral profile for the gaming industr. Bonus abusers tend to continue to play as long and with as little of their own money as possible without depositing money into their accounts. Along the way these players attempt to collect as many bonuses as possible.



Collect Your Bonus A Complete Solution for Time-Series Gaming Analytics

In today's world, the Age of Insights, the value of a business can be measured by the significance of the insights in its possession.

Gaming operators that are able to leverage insights of their player behavior to create personalized engagement and customized experiences are best-equipped to come out ahead in this fiercely competitive industry. These are the operators that will succeed in creating better and longer-term engagement, higher conversions and growth.

The methods we've presented in this ebook are from real experiences we've gained in working with gaming companies. Recognizing the gaming industry's needs for scalability and time-series analytics, Cooladata has developed a complete solution for behavioral analytics in the gaming industry. Addressing both mid-size and enterprise gaming companies, our solution services marketers, executive and product managers to deliver this insight-driven customer experience.

About Cooladata

Visit us at **www.cooladata.com**Call 1.646.581.9334
info@cooladata.com



Cooladata turns your event data into behavioral insights.

Our time-series behavioral analytics platform provides advanced tools to analyze raw data and elevate analysis beyond KPIs for effortless answers to your most complex business questions.

Built to collect data from any source, Cooladata's big data infrastructure covers all components from tracking, managed data warehousing, and ETL – all the way to the visualization layer.

As the most efficient path to big-data behavioral analytics, we provide the most cost-effective solution on the market. From e-commerce and gaming content providers to publishers and IoT innovators, Cooladata's solutions with ready-to-use dashboards are essential for any online company that depends on user behavior for business growth.