



A Practical Example of a Free-To-Play Economy

Covering the Basics of Game Economies

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We're going to show you the basics of **designing a game economy** for a free-to-play mobile game.

While in development, one of the most important aspects of the design (and also the most difficult) is the in-game economy. A game could sport a brilliant and intuitive new user experience, as well as state-of-the-art graphics, but if the tuning and balance is not optimized the game stands a chance at commercial failure. The supply and demand of digital currencies is what drives player progression through the content and serves as the pivotal element for monetizing players, so paying special attention to the underlying economy is vital for maximum chance of success at launch.

In order to demonstrate the framework for thinking about an economy, we're using an example of a fictitious new game. Over the course of this article, we will cover:

- » Currency Types and Their Roles
- » Sinks and Faucets: Designing Against Currency Inflation
- » Pinch Point: Converting Players to Payers
- » Content Progression: Making the Game Last

After the article, if you'd like to see examples of great economies, consider subscribing to [Teardown Club](#), for our weekly freemium game deconstruction.

Our Fictitious Game: Arcade Adventure!







To create our economy we've invented a fictitious game in the city builder genre — our players will be tasked with owning and operating their own arcade store! They'll start with a small shop, and slowly add new arcade games and pinball machines with the goal of creating a dynasty and having the most profitable and fun arcade business in the world.

Players will place various machines around the map. Those machines will earn coins when customers enter the store, and the player must load into the game to collect the resources. The resources are then used to both upgrade existing machines, purchase new ones, and research new business strategies to bring in more customers.

Virtual Currency Types And Their Roles

Now that we know the basics of how the game is played, we need to determine what the inflows and outflows are, as well as what currencies are used for which buildings. Part of the fun of “city builder” genre games is the management of resources, so not only are we **building an economy** in which we will throttle players with, but also adding a layer of complexity to the game design and making it more strategic.

We will introduce a few different currencies to throttle progression. One is a premium currency called diamonds, which players will use to speed up wait timers. Next, we'll use a few soft currencies -- Coins and Prizes -- as well as Experience Points (XP), to round out the core-loop.

Currency	Name	Type	Description
	Diamonds	Hard Currency	Most rare currency – used for speed ups and requirement buy through. Players can turn their \$ into diamonds
	Coins	Soft Currency	The game's “soft currency.” Purchases new buildings and also purchases presents to run the Big Games
	Prizes	Soft Currency	Prizes are dropped randomly from Arcades and purchased with coins, these are required to work the Big Games
	Experience	Soft Currency	Experience is gained from having players play the Big Games, as well as after upgrading buildings. This is required to upgrade the Ticket Booth

Purchases new buildings and also purchases presents to run the Big Games



Purchases new buildings and also purchases presents to run the Big Games



Players gain experience from running the Big Games, and the XP is used to upgrade the Ticket Booth (HQ).



Used for speeding up timers, decoration items, or for buying through requirements for buildings.



Even though diamonds are the premium currency, we give the new player a **large amount of them for free** at the beginning. This currency is the primary way we monetize the game, and players want to be able to progress faster, so the diamonds are used to speed up the timers in the game to let them do that. When the user runs out of the free courtesy diamonds, they will purchase more from the store with real dollars. The rest of the currencies are soft currencies, meaning they are earned through core loop actions and regular gameplay, and give the user the ability to manage their day-to-day operations in game.

Sinks and Faucets

Currency Inflows and Outflows

Now that we have defined the currencies in our game, we need to design how these are gained and spent by the user. The soft currencies are created by the different building types, which are described below.

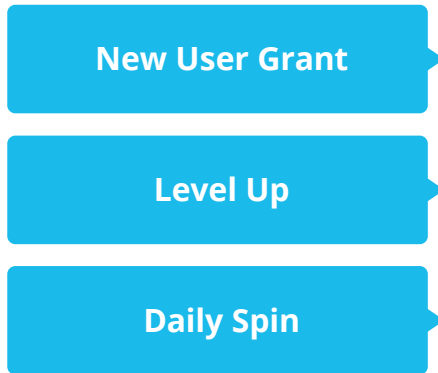
Building	Type	Inflows	Outflows	Description
Ticket Booth	Main HQ		New Unlocks	Main HQ of the the game – as you level up you need to upgrade this building to get access to new content.
Arcade Machine	Resource Building			Arcade machines are upgradable to earn more coins
Big Machine	Resource Building			For lack of better term, these are the large machines with long timers, but reward experience points.
Upgraders	Research Buildings		Bufs	These builds are also requirements for upgrading the Ticket Booth, but also are used to research marketing plans or also output more coins

The core loop is: the player earns coins (from Arcades), which they'll use to buy Prizes to use in the Big Games, which reward XP which levels their Store, allowing them to expand their store and get new machines.



The inflow and outflow of the premium currency - diamonds - is fairly easy to calculate, and by modeling those out over the lifetime of a user, we should be able to see exactly how much real dollar value we are giving away. We don't want to give too many diamonds away for free and take away potential spend from players who might want to pay, but we want to make sure that we are also being generous in terms of giving players some premium currency to use and experiment with in order to see how valuable it can be for progressing faster. We talk more about the balancing act for premium currency in the Pinch Point section below.

Inflows



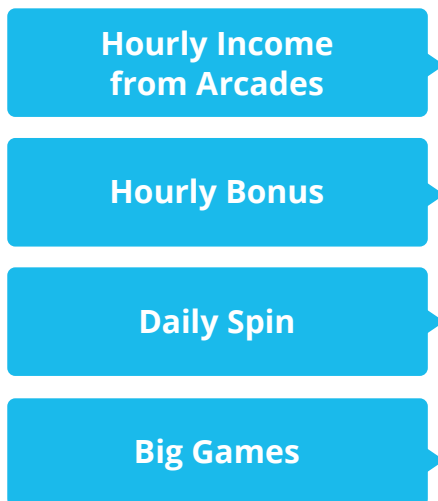
Outflows



Our soft currency progression is a little bit more complex to balance, as the soft currency is baked into the core loop of the game, and determines how much progress a player can make during the course of a day's play.

We need to design this currency to be readily available to users who play the game. If we throttle the soft currencies too much, then players will feel they aren't able to perform any game actions. If we give too many currencies away, then the player will be able to purchase everything they want, and the game will become boring due to the lack of meaningful resource management.

Inflows



Outflows



In our game, and with many other games in this genre, we limit the maximum number of coins a player can hold at one time. We'll do this by introducing a new building that holds the player's coins. In *Arcade Adventure*, this building is called the Quarter Machine, and as you upgrade this building, you can hold more currency, which is required to build the more advanced buildings. Think of this building as the barn in *Hay Day* or the Bank in *Cartel Kings*.

Quarter Machine	Coins Per Hour	Cumulative Coins Per Hour	Hours Until Full	Quarter Machine Cap
Arcade 1	50	50	48	2400
Arcade 2	100	150	48	7200
Arcade 3	200	350	48	16800
Arcade 4	400	750	48	36000
Arcade 5	800	1550	48	74400
Arcade 6	1000	2550	48	122400
Arcade 7	1200	3750	48	180000
Arcade 8	1400	5150	48	247200
Arcade 9	1600	6750	48	324000
Arcade 10	1800	8550	48	410400



We are pegging the cap of the Quarter Machine to be able to **take 48 hours for the bank to become full**, in order to drive regular check-in to empty the stores and spend.

In our table above, there are a few things to note. First, we are making an assumption that as the player levels up, the amount of Coin income increases. Secondly, we determine the Coin cap based on the **design goal of having the user come in to collect their Coins**. So starting from 0 Coins, the Quarter Machine will be full after 48 hours. This way, if the user spends too much time away from the app, they will not be able to play optimally and resource production will halt.

When we introduce the Quarter Machine building, we are able to help mitigate inflation of resources, so that when we utilize other features such as Daily Spins and Hourly Bonuses, we are able to control the amount of progress through the cap on Coins.

The other currency exchange rate that we need to make sure is tuned correctly, is the amount of Experience Points given out at the Big Games. For example, the first Big Machine (let's say, a Skee Ball Machine) will reward 5 Experience Points per hour. For this first example, we will say that the Skee ball machine takes in 1 Prize as its input, takes 5 hours to complete, and rewards a total of 25 Experience Points.

As the player gets to higher levels, the new Big Games will produce more Experience Points per hour. As you can see from the table below, if the player is playing optimally and not skipping with diamonds, they'll reach the maximum amount of XP after 48 days. This doesn't include wait timers for upgrading the Ticket Booth or other buildings, but just the amount of Experience Points required to unlock Level 10. In another section, we talk about how we ensure that all content lasts through our goal of 90 days through upgrade requirements.

Ticket Booth	XP to Next	XP Per Hour	Hours	Days	Cumulative Days
Level 1	25	5	5	0	0
Level 2	50	5	10	0	1
Level 3	100	5	20	1	1
Level 4	250	15	17	1	2
Level 5	500	15	33	1	4
Level 6	1000	100	10	0	4
Level 7	5000	100	50	2	6
Level 8	25000	100	250	10	16
Level 9	50000	200	250	10	27
Level 10	100000	200	500	21	48



The XP per hour is the amount that the Big Games give out as you unlock them.

The soft currencies are often the most difficult to balance, and proper playtesting and tuning are crucial, especially at the early levels. Later levels are harder to playtest, but with some work in Excel we can predict how long players will take to complete the game.

It's important to note that every time a Big Machine is ready to be collected, the player will receive a notification on their phone. In order to send the most amount of notifications, we need to get players (on iOS) to opt into for permissions to send them. [We cover best-practices for push notifications](#) in another post.

Economy Pinch Points

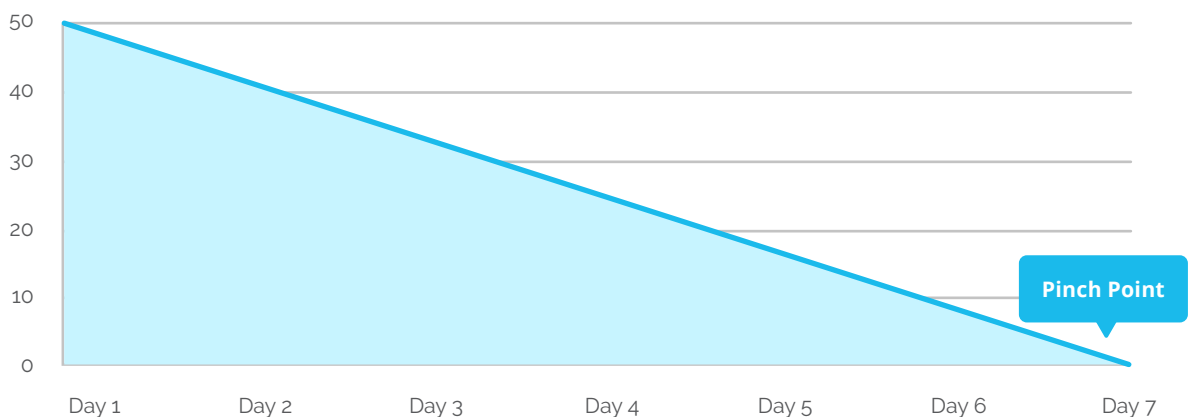
Turning Players to Payers

Going back to our hard currency, we mentioned previously that we will give a good amount of diamonds away to the user for free. Since our game involves waiting for resources and for Big Games to be able to produce Experience Points, as well as upgrade timers, the player will want to speed through some of these to be able to level up faster. Diamonds allow the user to skip timers, but since there is limited amount of these for free, at some point they will run out and potentially wish to purchase more.

For our modelling, we want the player to run out of currency in the first week of play. We call this moment a “pinch point” because the player will lack the resources he needs to continue at that point in the game. He will be “pinched.” To determine this pinch point we assume that the player spends an average 10 Joysticks each day, we give the user 2 Joysticks for free per day, and the user starts with 50 Joysticks for free at the start. As you can see, the Pinch Point occurs on the 7th day for the user. Of course, once we have some user data we'll want to rerun these numbers with a real user value for joystick spend.



Diamonds Owned



	Amount
Starting Amount	50
Spend Per Day	10
Free for Day	2

Timers are great for the city building genre. We discuss avenues to [monetize midcore games](#) in another post.

	Amount Owed
Day 1	50
Day 2	42
Day 3	34
Day 4	26
Day 5	18
Day 6	10
Day 7	2

Content Progression

Making the Game Last

We've noted that if the player is playing optimally, collecting Experience Points will take 48 days to be able to reach the maximum level. One of our design goals is to make the content last 3 months (90 days), since that gives us ample time to develop new content and release an update to keep the content engaging longer. Many developers consider 90 days the minimum amount for launching a game, and doing any less than that will result in your most engaged players becoming bored after they plow through the content and lapse.

However, in addition to the XP requirements, we need players to upgrade their Ticket Booth, our main headquarters, to reach the next level. Each Ticket Booth upgrade has 3 requirements:

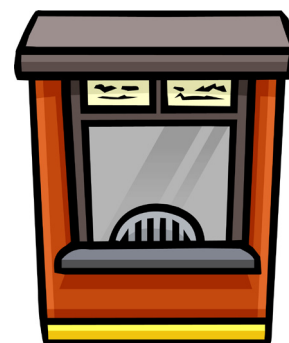
- » That the user has the required XP (achieved through collecting Big Games)
- » The user has upgraded their Quarter Machine to the required level
- » The user has upgraded their Snack Booth to the required level

After that, the user can then upgrade their Ticket Booth, which will then allow them to unlock the content that is gated by the Booth's level. Our total time waiting is the sum of all of those requirements over the course of 10 levels. We already defined the wait time for the total amount of XP required to be 48, so we only need another 41 days of content to reach our goal of 90 days total time.

The numbers are shown in the tables below. The best way to calculate these is to work backwards - see how many days you want the content to last, and then see what the timers should be at each level.

Ticket Booth	Minutes Wait	Cost (Diamonds)	Cost (Dollars)	Days
1	180	30	3	.05
2	360	60	6	.1
3	360	60	6	.1
4	720	120	12	.3
5	1440	240	24	.5
6	2880	480	48	1
7	5760	960	96	2
8	11520	1920	192	3
9	23040	3840	384	5
10	46080	7680	768	7

Ticket Booth is our main building, and the main lever of progression, therefore we give it a different wait timers – twice as long as the other buildings. However, the building cannot be upgraded without the other Buildings being at the required level.



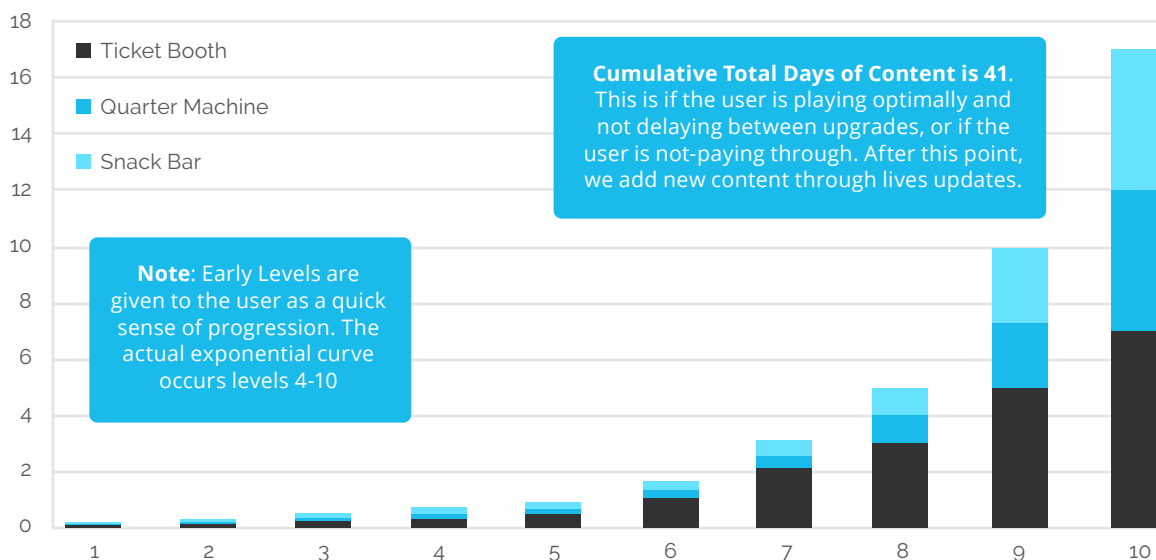
Quarter + Snack Bar	Minutes Wait	Cost (Diamonds)	Cost (Dollars)	Days
1	180	30	3	.05
2	180	30	3	.05
3	360	60	6	.1
4	180	30	3	.05
5	360	60	6	.1
6	900	150	15	.25
7	1800	300	30	.5
8	3600	600	60	1
9	9000	1500	150	2.5
10	18000	3000	300	5

The other buildings, while probably serving other purposes (researching, or some kind of income) are prerequisites to the **Ticket Booth** being upgraded, thus we can sum all their upgrading times to get the total time for unlocking all content.



For all of the upgrade timers, we follow an exponential curve. In the early game, upgrades happen quickly, but then turn into longer and longer waits as the game progresses. This curve is demonstrated in the graph below. We also made the Ticket Booth timer have a slightly longer wait than the other two buildings, since it is the most important.

Wait Timers for Upgrade Buildings

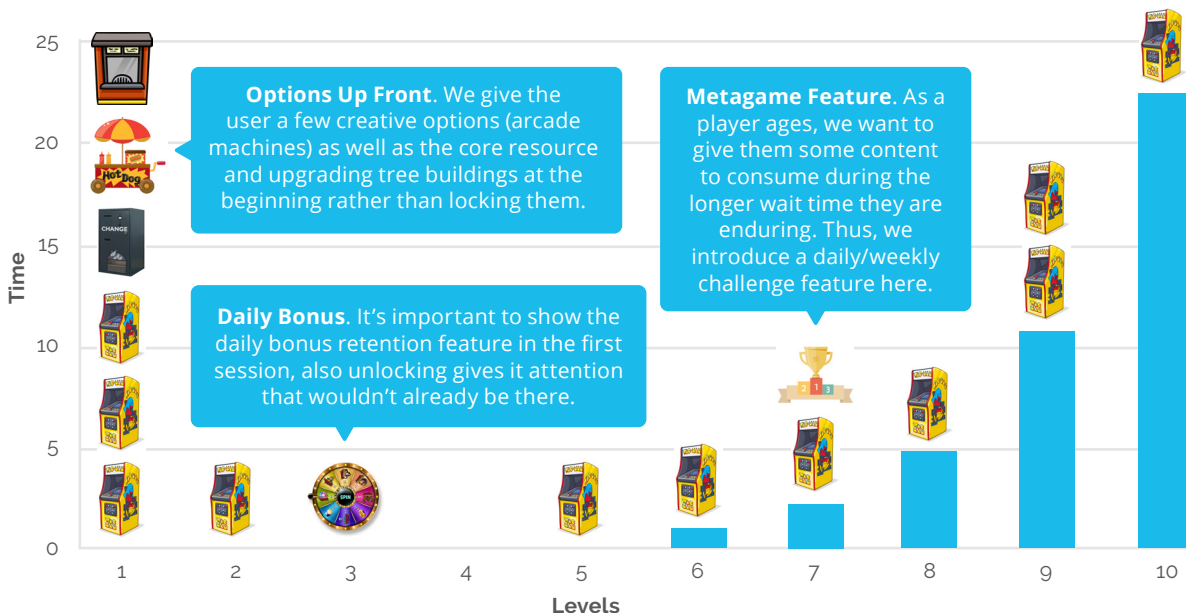


Now that we have established that the level requirements span a total of 90 days, we must divide up the content across these levels to ensure the players achieves something by progressing (and has fun doing so).

In the graph below, we give an example of how new feature and Arcade Machine unlocks are distributed across levels. We want to make sure that there is at least one new arcade at every level.

Additionally, we unlock our social feature at level 7. Since the timers are starting to get longer, we want to give players something to do daily. This feature can be daily challenges, guilds, or leaderboards; as long as the feature enables daily progress on another plane than the wait timers (i.e. creates a metagame), then the goal of that feature is achieved.

Total Upgrade Time to Next Level



As we can see above, we have now achieved a content progression that gives the player something new at every level (creates a hook) as well as ensures that the optimal player will last 90 days. We have also created sinks through the amount of timers - each of the timers can be sped up with Diamonds, so our whale/high-spending players will be required to spend thousands of dollars in order to skip all the timers. While this won't happen except in the most extreme of cases, it's important to let our players decide when and how they want to spend their money, and giving them every opportunity to do so.

Conclusion

Arcade Adventure is not a real game (although doesn't it sound fun?), and therefore, there are a lot of parts of the game still undefined. However, we have designed the foundation of the game's progression - something that should be thought of as early in development as possible. If left to the last minute, it could spell disaster as it is hard to retrofit a good progression model.

If you'd like to talk more specifically about your game - [please reach out to us](#). We're happy to see if your game has the right tools to keep players engaged and spending over many months.