



What the first big blockchain game

says about NFTs

and the future of cryptocurrency

Illustration by Frank Stockton

The Spectacular COLLAPSE of CRYPTOKITTIES

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ON 4 SEPTEMBER 2018, someone known only as Rabono bought an angry cartoon cat named Dragon for 600 ethers—an amount of Ethereum cryptocurrency worth about US \$170,000 at the time, or \$745,000 at the cryptocurrency's value in July 2022. • It was by far the highest-priced transaction yet for a nonfungible token (NFT), the then-new concept of a unique digital asset. And it was a headline-grabbing opportunity for *CryptoKitties*, the world's first blockchain gaming hit. But the sky-high cost of the transaction obscured a more difficult truth: *CryptoKitties* was dying, and it had been for some time. • Dragon was never resold—a strange fate for one of the most historically relevant NFTs ever. Newer NFTs such as “The Merge,” a piece of digital art that sold for the equivalent of \$92 million, left Dragon behind as the NFT market surged to record sales, totaling roughly \$18 billion in 2021. Has the world simply moved on to newer blockchain projects? Or is this the fate that awaits all NFTs?

BLOCKCHAINS, SMART CONTRACTS, AND CAT GENES

TO UNDERSTAND the slow death of *CryptoKitties*, you have to start at the beginning. Blockchain technology arguably began with a 1982 paper by the computer scientist David Chaum, but it reached mainstream attention with the success of Bitcoin, a cryptocurrency created by the anonymous person or persons known as Satoshi Nakamoto. At its core, a blockchain is a simple ledger of transactions placed one after another—not unlike a very long Excel spreadsheet.

The complexity comes in how blockchains keep the ledger stable and secure without a central authority; the details of how that's done vary among blockchains. Bitcoin, though popular as an asset and useful for moneylike transactions, has limited support for doing anything else. Newer alternatives, such as Ethereum, gained popularity because they

allow for complex “smart contracts”—executable code stored in the blockchain.

CryptoKitties was among the first projects to harness smart contracts by attaching code to data constructs called tokens, on the Ethereum blockchain. Each chunk of the game’s code (which it refers to as a “gene”) describes the attributes of a digital cat. Players buy, collect, sell, and even breed new felines. Just like individual Ethereum tokens and bitcoins, the cat’s code also ensures that the token representing each cat is unique, which is where the nonfungible token, or NFT, comes in. A fungible good is, by definition, one that can be replaced by an identical item—one bitcoin is as good as any other bitcoin. An NFT, by contrast, has unique code that applies to no other NFT.

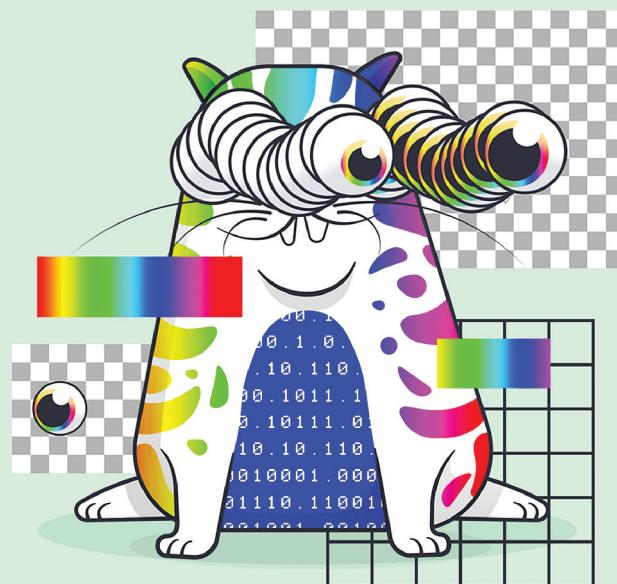
There's one final piece of the blockchain puzzle you need to understand: “gas.” Some blockchains, including Ethereum, charge a fee for the computational work the network must do to verify a transaction. This creates an obstacle to overworking the



What's a CryptoKitty?

Each CryptoKitty is a token, a set of data on the Ethereum blockchain. Unlike the cryptocurrencies Ethereum and Bitcoin, these tokens are nonfungible—that is, they are not interchangeable.

Unique ID	Mother's ID, father's ID	Genes
The unique ID makes a CryptoKitty a nonfungible token.	The token contains the kitty's lineage and other data.	The kitty's genes determine its unique look.



blockchain's network. High demand means high fees, encouraging users to think twice before making a transaction. The resulting reduction in demand protects the network from being overloaded and transaction times from becoming excessively long. But it can be a weakness when an NFT game goes viral.

THE RISE AND FALL OF CRYPTOKITTIES

LAUNCHED ON 28 NOVEMBER 2017 after a five-day closed beta, *CryptoKitties* skyrocketed in popularity on an alluring tagline: the world's first Ethereum game.

"As soon as it launched, it pretty much immediately went viral," says Bryce Bladon, a founding member of the team that created *CryptoKitties*. "That was an incredibly bewildering time."

Sales volume surged from just 1,500 nonfungible felines on launch day to more than 52,000 on 10 December 2017, according to NonFungible.com, with many *CryptoKitties* selling for valuations in the hundreds or thousands of dollars. The value of the game's algorithmically generated cats led to coverage in hundreds of publications.

What's more, the game arguably drove the success of Ethereum, the blockchain used by the game. Ethereum took off like a rocket in tandem with the release of *CryptoKitties*, climbing from just under \$300 per token at the beginning of November 2017 to just over \$1,360 in January 2018.

Ethereum's rise continued with the launch of dozens of new blockchain games based on the cryptocurrency through late 2017 and 2018. *Ethermon*, *Ethercraft*, *Ether Goo*, *CryptoCountries*, *CryptoCelebrities*, and *CryptoCities* are among the better-known examples. Some arrived within weeks of *CryptoKitties*.

This was the break fans of Ethereum were waiting for. Yet, in what would prove an ominous sign for the health of blockchain gaming, *CryptoKitties* stumbled as Ethereum dashed higher.

Daily sales peaked in early December 2017, then slid into January and, by March, averaged less than 3,000. The value of the NFTs themselves declined more slowly, a sign the game had a base of dedicated fans like Rabono, who bought Dragon well after the game's peak. Their activity set records for the value of NFTs through 2018. This kept the game in the news but failed to lure new players.

Today, *CryptoKitties* is lucky to break 100 sales a day, and the total value is often less than \$10,000. Large transactions, like the sale of Founder Cat #71 for 60 ethers (roughly \$170,000) on 30 April 2022, do still occur—but only once every few months. Most nonfungible fur-babies sell for tiny fractions of 1 ether, worth just tens of dollars in July 2022.

CryptoKitties' plunge into obscurity is unlikely to reverse. Dapper Labs, which owns *CryptoKitties*, has moved on to projects such as NBA Top Shot, a platform that lets basketball fans purchase NFT "moments"—essentially video clips—from NBA games. Dapper Labs did not respond to requests for an interview about *CryptoKitties*. Bladon left Dapper in 2019.

WHAT WENT WRONG?

ONE CLUE TO THE GAME'S DEMISE can be found in the last post on the game's blog (4 June 2021), which celebrates the breeding of the 2 millionth CryptoKitty. Breeding, a core mechanic of the game, lets owners pair their existing NFTs to create algorithmically generated offspring. This gave the NFTs inherent value in the game's ecosystem. Each NFT was able to generate more NFTs, which players could then resell for profit. But this game mechanism also saturated the market. Xiaofan Liu, an assistant professor in the department of media and communication at City University of Hong Kong who coauthored a paper on *CryptoKitties*' rise and fall, sees this as a flaw the game could never overcome.

"The price of a kitty depends first on rarity, and that depends on the gene side. And the second dimension is just how many kitties are on the market," Liu says. "With more people came more kitties."

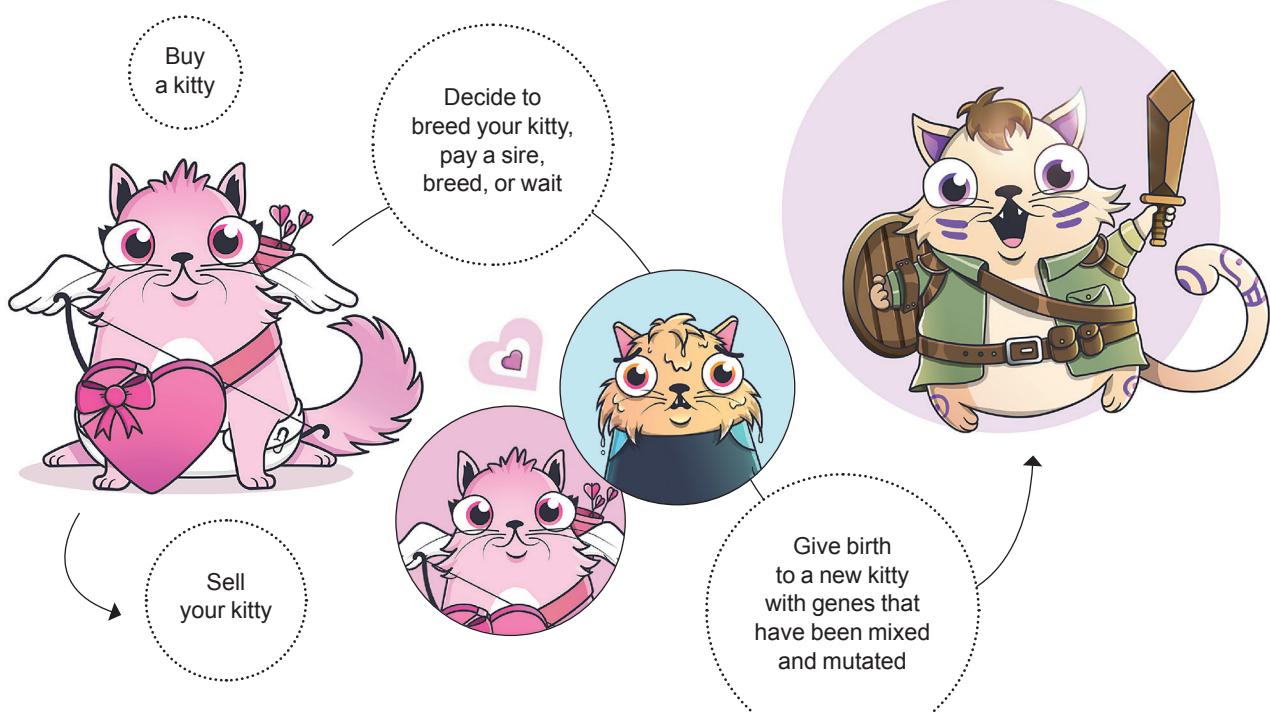
More players meant more demand, but it also meant more opportunities to create supply through breeding new cats. This quickly diluted the rarity of each NFT.

Bladon agrees with that assessment of the breeding mechanism. "I think the criticism is valid," he says, explaining that it was meant to provide a sense of discovery and excitement. He also hoped it would encourage players to hold on to NFTs instead of immediately selling, as breeding, in theory, provided lasting value.

The sheer volume of *CryptoKitties* caused another, more immediate problem: It functionally broke the Ethereum blockchain, which is the world's second most valuable cryptocurrency by market capitalization (after Bitcoin). As explained earlier, Ethereum uses a fee called gas to price the cost of transactions. Any spike in transactions—buying, siring, and so on—will cause a spike in gas fees, and that's exactly what happened when *CryptoKitties* went to the moon.

"Players who wanted to buy *CryptoKitties* incurred high gas fees," Mihai Vicol, market analyst at Newzoo, said in an interview. "Those gas fees were anywhere from \$100 to \$200 per transaction. You had to pay the price of the *CryptoKitty*, plus the gas fee. That's a major issue."

The high fees weren't just a problem for *CryptoKitties*. It was an issue for the entire blockchain. Anyone who wanted to trans-



The Game

The *CryptoKitties* blockchain game involves collecting, selling, and breeding nonfungible felines. The example here assumes your kitty is female.

act in Ethereum, for any reason, had to pay more for gas as the game became more successful.

This dynamic remains a problem for Ethereum today. On 30 April 2022, when Yuga Labs released Otherdeeds—NFTs that promise owners metaverse real estate—it launched Ethereum gas fees into the stratosphere. The average price of gas briefly exceeded the equivalent of \$450, up from about \$50 the day before.

Although *CryptoKitties*' demands on the network subsided as players left, gas will likely be the final nail in the game's coffin. The median price of a CryptoKitty in the past three months is about 0.04 ethers, or \$40 to \$50, which is often less than the gas required to complete the transaction. Even those who want to casually own and breed inexpensive CryptoKitties for fun can't do it without spending hundreds of dollars.

BLOCKCHAIN GAMES: TWO STEPS FORWARD, ONE STEP BACK

THE RISE AND FALL of *CryptoKitties* was dramatic but gave its successors—of which there are hundreds—a chance to learn from its mistakes and move past them. Many have failed to heed the lessons: Modern blockchain gaming hits such as *Axie Infinity* and *BinaryX* had a similar initial surge in price and activity followed by a long downward spiral.

“Anything that was emblematic of *CryptoKitties*’ success was aped. Anything that wasn’t immediately visible was mostly ignored,” says Bladon. And it turns out many of *CryptoKitties*’ difficulties weren’t visible to the public. “The thing is, the *CryptoKitties* project did stumble. We had a lot of outages. We had to deal with a lot of people who’d never used blockchain before. We had a bug that leaked tens of thousands of dollars of ether.” Similar problems have plagued more recent NFT projects, often on a much larger scale.

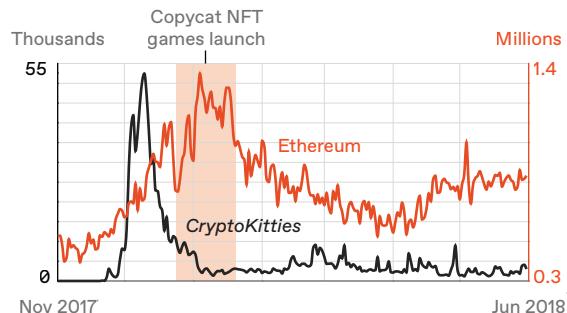
Liu isn’t sure how blockchain games can curb this problem. “The short answer is, I don’t know,” he says. “The long answer is, it’s not just a problem of blockchain games.”

World of Warcraft, for example, has faced rampant inflation for most of the game’s life. This is caused by a constant influx of gold from players and the ever-increasing value of new items introduced by expansions. The continual need for new players and items is linked to another core problem of today’s blockchain games: They’re often too simple.

“I think the biggest problem blockchain games have right now is they’re not fun, and if they’re not fun, people don’t want to invest in the game itself,” says Newzoo’s Vicol. “Everyone who spends money wants to leave the game with more money than they spent.”

That perhaps unrealistic wish becomes impossible once the downward spiral begins. Players, feeling no other attachment to the game than growing an investment, quickly flee and don’t return.

Daily Transaction Volume



The launch of *CryptoKitties* drove up the number of transactions on the Ethereum blockchain. Even as the game’s daily transaction volume plummeted, the number of Ethereum transactions continued to rise, possibly because of the arrival of multiple copycat NFT games.

Whereas some blockchain games have seemingly ignored the perils of *CryptoKitties*’ quick growth and long decline, others have learned from the strain it placed on the Ethereum network. Most blockchain games now use a sidechain, a blockchain that exists independently but connects to another, more prominent “parent” blockchain. The chains are connected by a bridge that facilitates the transfer of tokens between each chain. This prevents a rise in fees on the primary blockchain, as all game activity occurs on the sidechain.

Yet even this new strategy comes with problems, because sidechains are proving to be less secure than the parent blockchain. An attack on Ronin, the sidechain used by *Axie Infinity*, let the hackers get away with the equivalent of \$600 million. Polygon, another sidechain often used by blockchain games, had to patch an exploit that put \$850 million at risk and pay a bug bounty of \$2 million to the hacker who spotted the issue. Players who own NFTs on a sidechain are now warily eyeing its security.

REMEMBER DRAGON

THE CRYPTOCURRENCY WALLET that owns the near-million-dollar kitten Dragon now holds barely 30 dollars’ worth of ether and hasn’t traded in NFTs for years. Wallets are anonymous, so it’s possible the person behind the wallet moved on to another. Still, it’s hard not to see the wallet’s inactivity as a sign that, for Rabono, the fun didn’t last.

Whether blockchain games and NFTs shoot to the moon or fall to zero, Bladon remains proud of what *CryptoKitties* accomplished and hopeful it nudged the blockchain industry in a more approachable direction.

“Before *CryptoKitties*, if you were to say ‘blockchain,’ everyone would have assumed you’re talking about cryptocurrency,” says Bladon. “What I’m proudest of is that it was something genuinely novel. There was real technical innovation, and seemingly, a real culture impact.” ■