

Cubit: The World's Rarest Digital Artifact (NFT)

The Disentropic Foundry

<https://cubits.wtf>

Abstract. The recent discovery of Cubits, a novel type of digital artifact found on the Bitcoin network, will have a significant impact on the world of non-fungible tokens (NFTs) due to their potential value and rarity. A Cubit is a block on a proof-of-work blockchain that includes a single ordinal inscription as its only activity. This paper delves into the technical features and formation process of Cubits, including their objective and subjective value. We also examine network statistics and draw comparisons between Cubits and other on-chain digital artifacts, emphasizing their importance and potential to be recognized as the rarest NFTs worldwide.

1. Introduction

Cubits are rare digital artifacts that can be regarded as an extension of Ordinal Theory [1] and are blocks on a proof-of-work (PoW) blockchain that encompass a solitary ordinal inscription. This paper presents a comprehensive analysis of the Cubit, including its technical properties, formation process, and value proposition. We also undertake a comparative study of Cubits and other on-chain artifacts, with emphasis on their potential to objectively emerge as the rarest and most valuable digital artifact/NFT globally. Finally, we conclude by discussing the future prospects of Cubits and their potential impact on the NFT market.

2. Formation

Diamonds and other precious gemstones are formed through a unique set of circumstances and time constraints in the natural world. In a similar vein, Cubits are rare digital artifacts that can only be produced under specific conditions on a PoW blockchain. A Cubit is created when a single satoshi inscription (ordinal) is the only activity within an entire block that is backed by PoW. Although any block with a single inscription fits the definition of a Cubit, inscriptions with less data are deemed more pristine and valuable. Cubits produced by The Disentropic Foundry are SVG inscriptions with a size of 134 bytes (subject to change in the future).

3. Properties

Cubits are inherently one-of-a-kind and possess unique properties that are solely determined by the network that generates them. Their rarity is not influenced by any subjective human input. Therefore, the characteristics that define Cubit rarity can be categorized as follows:

On-chain Statistics:

- **Block Height:** The height of the block in which the Cubit is created is a critical factor in determining its value. It represents the age of the Cubit.
- **Transaction Size:** The size of the transaction(s) that make up the inscription within the block play a significant factor in determining a Cubit's value. Cubits with less data are rarer and more valuable.
- **Inscription Number:** The inscription number of the Cubit also plays a role in determining its value. Cubits with lower inscription numbers are older from a historical perspective and there is normally some level of subjective value when dealing with people and numbers.

Data Crystallization:

- **Total Energy (kWh/bit):** Creating each Cubit requires a *substantial* amount of energy, making the energy used per bit of data a crucial factor in determining a Cubit's rarity and value. The total kilowatt hours (kWh/bit) consumed in creating a Cubit is arguably the most important consideration.
- **Hash Rate Exposure (TH/s):** Cubits created on proof-of-work blockchains with higher hash rates have greater value due to their exposure to a larger network of miners. Higher hash rates result in increased validation and value.
- **Formation Time (in seconds):** The time it takes to form a Cubit also contributes to its rarity and value. Cubits that are exposed to the network's hash rate for extended periods are more rare and more energized. The longer a Cubit is exposed to the network's hash rate, the more difficult and energy-intensive it is to create, making it more valuable.

Color:

- Cubits are akin to natural gemstones, as they derive their color from the specific conditions in which they are formed. In the case of a Cubit, its color is derived exclusively from the blockchain data, thereby removing any human bias. The process involves generating a unique color hex based on the data of the preceding Cubit's block, resulting in a chain of Cubits with distinct colors. The only exception is the first cubit, which derives its color from the Genesis Bitcoin block and is color hex #000 (black).

Fingerprint:

- Each cubit has a unique fingerprint that is generated from the block data and can be used to validate their authenticity as coming from the original discoverers, The Disentropic Foundry.

4. Value Theory

The value of a Cubit can be assessed through a combination of objective and subjective criteria. Objectively, each Cubit is a unique digital artifact formed through the proof-of-work mechanism, similar to how precious metals and gemstones are formed in the natural world. This gives each Cubit a rarity that is not determined by humans, and the properties that make up a Cubit are solely determined by the PoW process. Unlike most (if not all) other digital artifacts and NFTs, a Cubit's floor price can be objectively determined by the total costs associated with its formation, making it a great store-of-value.

In the world of art, whether it be physical, digital, or conceptual, subjectivity reigns supreme. Cubits are no exception. While certain characteristics such as color and lucky numbers may be obvious factors in their appeal, the notion of owning an entire block can also be perceived as a symbol of exclusivity/elitism and hold significant allure from a vanity perspective. Such subjective qualities lend Cubits a certain mystique that is both exciting and alluring to collectors and Bitcoin enthusiasts alike.

5. Formation Schedule

The creation schedule of a Cubit is inherently unpredictable due to the nature of mining on the blockchain. While theoretically possible with every block mined, the probability of a Cubit's creation in consecutive blocks is very low. As the hashrate and mining difficulty increase, so does the cost associated with forming a Cubit, making its creation much more unlikely over time. It is speculated that in the future, the formation of Cubits could be likened to rare astronomical events that occur only once every few hundred years.

6. Network Statistics

As of the time of writing, it is notable that the proof-of-work blockchain with the highest hash rate consumes almost 1% of the world's total energy [2]. This is a significant amount of energy, exceeding the power needed to operate the well-known technology giants Google and Facebook combined [3]. If this blockchain were to be treated as its own country, it would rank as the 27th largest energy consumer globally [4]. If every block mined on this blockchain was a Cubit from the time of discovery, it would take roughly 375 years to generate the same number of Cubits as there are Bitcoins.

7. Validation

Cubits formed by The Disentropic Foundry originate from the following address which can be used for validation purposes:

bc1pl64p74we0eucd2jsjgdmk580ah402t4d8cwppe67drdnwuw7u6sfa40a7

Authenticity can also be validated using the block height and the Cubit's unique fingerprint at <https://cubits.wtf/validate>

8. Conclusion

We conclude that the scientific and technological advancements that have led to the discovery of the Cubit mark a significant milestone in the history of data. The rarity of each Cubit, determined solely by proof-of-work, sets it apart from other digital artifacts and NFTs. The immense amount of energy required to create a single Cubit further highlights its value and uniqueness. Compared to Bitcoin's widely accepted moniker of "digital gold," Cubits' rarity and the substantial proof-of-work necessary to produce them could earn them the title of "digital diamonds." As the digital world continues to evolve and new technologies emerge, the Cubit represents a new frontier in data and digital assets.

There are "blue chip" NFTs and then there are Cubits.

Appendix

Energy Exerted

Bitcoin Miners
120 Billion kWh/year [5][6]
329 Million kWh/day
13.7 Million kWh/hour
2.3 Million kWh/block



Cubit
1 block
1 transaction
134 bytes
35,385 kWh/byte
4,420 kWh/bit

Cost

Bitcoin Miners
560,000 BTC (\$16.8 Billion)
1,533 BTC (\$46 Million)
63.3 BTC (\$1.9 Million)
10.7 BTC (\$320,000)



Cubit
1 block
1 transaction
134 bytes
0.08 BTC/byte (\$2,400)
0.01 BTC/bit (\$300)

One kWh is equivalent to roughly \$0.14 [7] at time of publication

One BTC is equivalent to roughly \$30,000 [8] at time of publication

BTC is the proof-of-work chain with the most hash rate [9] at time of publication

References

- [1] Rodarmor, Casey. (2023, January). Ordinal Theory Handbook. Retrieved from <https://docs.ordinals.com/>.
- [2] U.S Whitehouse, "FACT SHEET - Climate and Energy Implications of Crypto-Assets in the United States," <https://www.whitehouse.gov/ostp/news-updates/2022/09/08/fact-sheet-climate-and-energy-implications-of-crypto-assets-in-the-united-states>, 2022.
- [3] A. Sundaravelu, "Bitcoin uses eight times more energy than Google and Facebook combined," <https://metro.co.uk/2022/01/04/bitcoin-uses-8x-more-electricity-than-google-and-facebook-combined>, 2022.
- [4] N. McCarthy, "Bitcoin Devours More Electricity Than Many Countries," <https://www.forbes.com/sites/niallmccarthy/2021/05/05/bitcoin-devours-more-electricity-than-many-countries-infographic/?sh=1118722f41a6>, 2021.
- [5] J. Schmidt, "Why Does Bitcoin Use So Much Energy?" <https://www.forbes.com/advisor/investing/cryptocurrency/bitcoins-energy-usage-explained/>, 2022.
- [6] N. Carter, "How Much Energy Does Bitcoin Actually Consume?" <https://hbr.org/2021/05/how-much-energy-does-bitcoin-actually-consume>, 2021.
- [7] ElectricRate, "Pricing of Electricity by Country," <https://www.electricrate.com/data-center/electricity-prices-by-country/>, 2023.
- [8] CoinMarketCap, <https://coinmarketcap.com/currencies/bitcoin/>, 4/27/2023.
- [9] BitInfoCharts, "Bitcoin hashrate historical chart," <https://bitinfocharts.com/comparison/bitcoin-hashrate.html>, 4/27/23.