THE BLOCK | Research

The State of the Digital Asset Data and Infrastructure Landscape

April 2020

COMMISSIONED BY Blockset by BRD

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Executive Summary

The digital assets and blockchain technology industry has grown from a nascent ecosystem with a handful of participants to a professional space filled with investors, venture-backed startups and billion-dollar businesses. With hundreds of billions of dollars[1] in value flowing through the industry each year, the need for accurate and reliable information has grown significantly.

Due to the public nature of blockchains, blockchain data is accessible to all. This transparency, however, has not prevented new businesses from springing up and offering custom services built on these data sets. These services include indexing or structuring raw blockchain data, maintaining full blockchain nodes – which store the history of a network – to provide the node infrastructure for developers, as well as gathering, normalizing and storing market data from digital asset exchanges.

In this report, The Block examines the growth of the digital asset data and infrastructure sector. The Block contacted 51 firms for this report and completed interviews with 35 participants. These firms are segmented into three primary verticals:

- **Infrastructure providers**: blockchain-as-a-service products enabling developers and businesses to build blockchain-enabled applications
- **On-chain metrics providers**: insights and analytics across various blockchain networks
- **Market data providers**: price and trade-related data offerings on digital assets across various trading venues and financial markets

Methodology and Process

The surveyed firms were identified based on:

- The Block's previous research into the sector
- Insights from industry participants
- Data resources created by industry participants

Once identified, the companies were reached out to via email:

- The participants were asked whether they wanted to contribute to the report and participated in half-hour video interviews
- Those unable to participate in video interviews were given text-based interview questions
- During the interview process, The Block asked a variety of questions including:
  - The firm's challenges in the space
  - Sizing of various operational costs
  - The feature sets

A total of 35 firms completed the interview process, which was performed over the course of two weeks in February. Data for firms that did not participate in the interview process was manually collected using their websites and third-party media resources.

State of the Sector

There are 51 companies participating in the digital asset data and infrastructure sector. As established at the beginning of this report, the firms are segmented into three primary verticals. However, as the map, Exhibit I, shows, firms in our sample set can provide services across multiple verticals. Take Amberdata, for example, which offers services across all three verticals.

[1] Research Report - Employment trends in the digital asset industry commissioned by the Blockchain Association, The Block.

On-chain and markets data firms make up nearly two-thirds of the data service providers in our sample set. One reason for the dominance of these two verticals is the broad reach of their customer base. While infrastructure providers primarily focus on engineering teams, the market and on-chain data providers have a wider client base with retail consumers, financial institutions, and engineering teams.

More than half of the firms in The Block's sample set launched in either 2017 or 2018. These years coincide with the bull market of 2017 and the crash of institutional firms entering the space, a group that included the International Continental Exchange (ICE), CME Group, and Fidelity.

Distribution of Digital Assets Data & Infastructure Providers

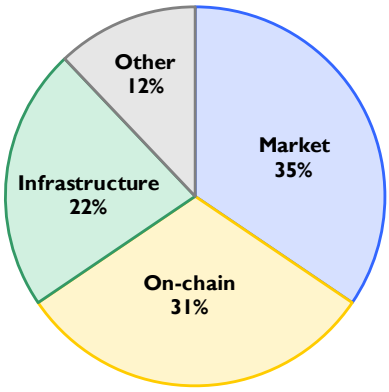


Exhibit I

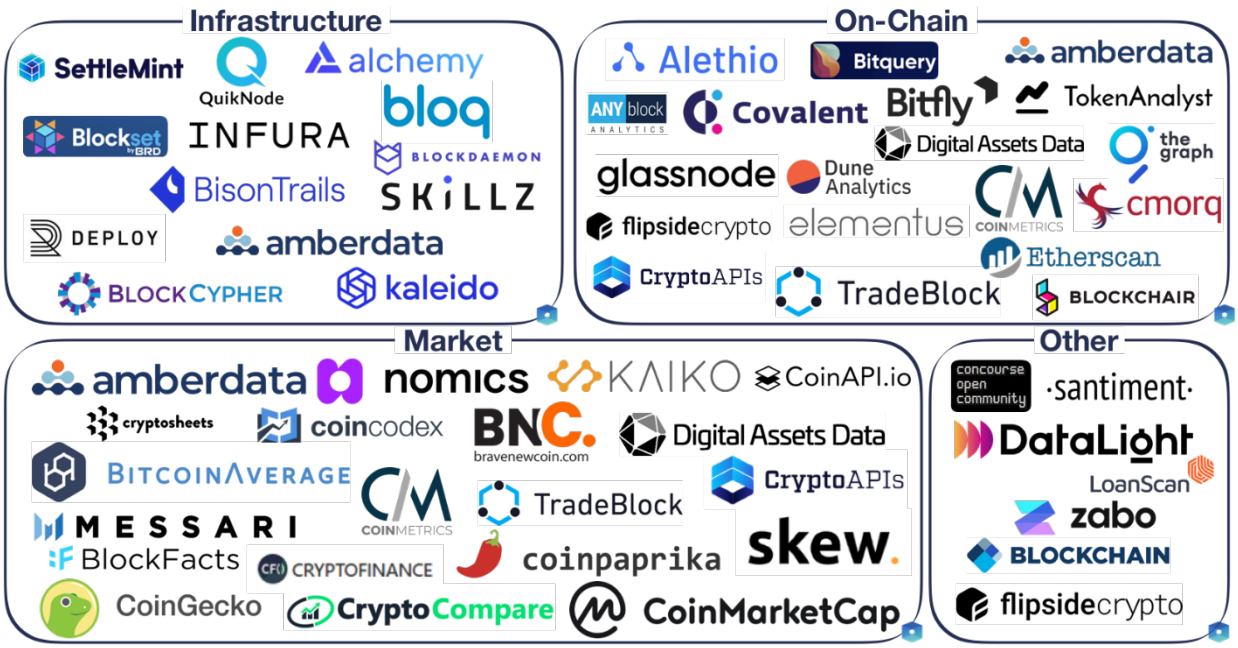
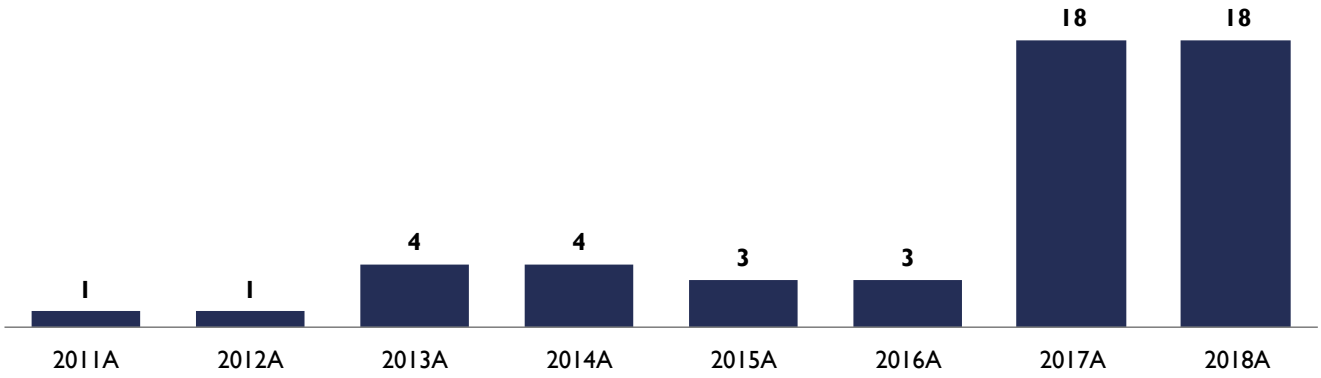


Exhibit II

Number of Firms by Inception



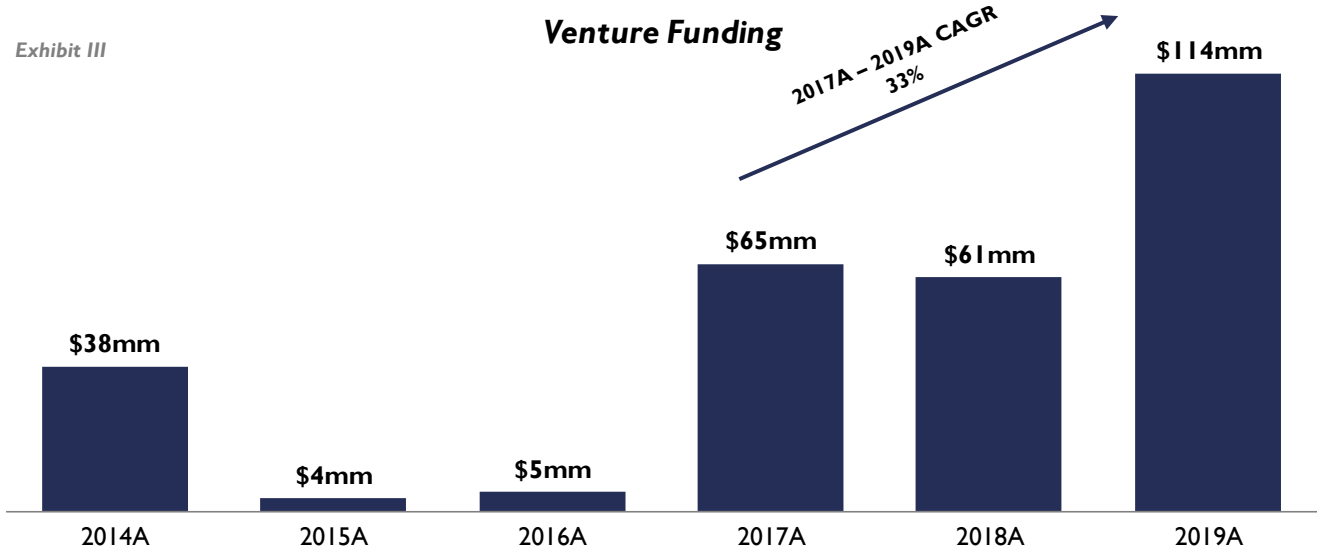
As the digital assets industry continued to show signs of growth, the rate of venture capital flowing into the data and infrastructure sector increased.[2]

Prior to 2017, there was limited venture funding activity. By the end of 2017, there had been a 1,183% year-over-year increase in venture funding. Between 2017 and 2019, the data and infrastructure space saw a 33% compound annual growth rate (CAGR). In aggregate, from 2014 to 2019, firms in the sector raised over $286mm in venture funding, with 44 deals completed—averaging $47.8mm per year and $6.5mm per deal. By comparison, over the same time frame, the broader blockchain and digital assets industry saw $16.2bn raised in venture funding across 2,775 deals—averaging $5.8mm per deal.[3]

Approximately 46% of the firms in our sample set chose to establish their headquarters in the United States, followed by the European Union (~22%) and the United Kingdom (~13%). These locations traditionally host major financial and business hubs which can provide ease of access to clients such as institutional investors, digital asset businesses, and developers.

Exhibit III

Venture Funding



# of Deals					
2	***2***	***4***	***5***	***12***	***18***

[2] Research Report - Employment trends in the digital asset industry commissioned by the Blockchain Association, The Block.

[3] 2019: a year in blockchain investment deals, The Block.

In total, the companies in our sample set have hired 850 employees at an average of 17 employees per firm.

The largest employers in this industry are Blockset, CryptoCompare, and Santiment as shown in Exhibit V.[4]

Note that some of these firms, such as Blockchain, do not consider data as their primary business, and the bulk of their employees likely focus on what they identify as their core offering. As a result, we have not included them in the Exhibit V.

Exhibit IV

Firm Distribution by Headquarters

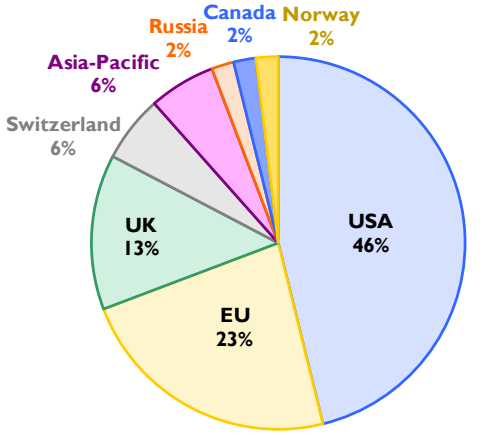
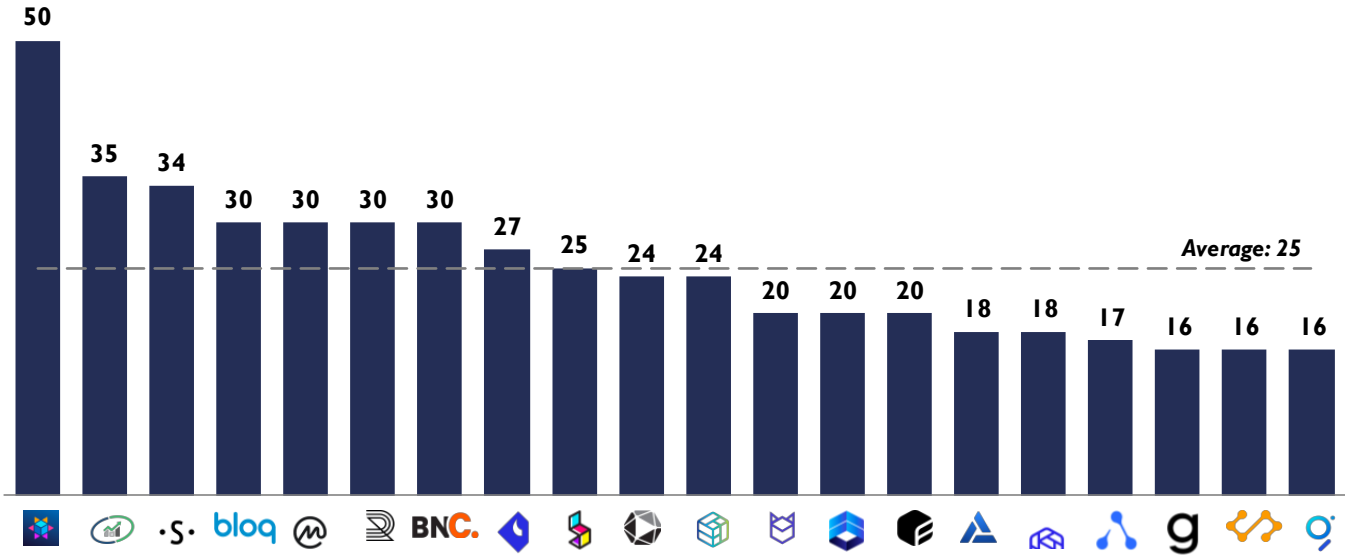


Exhibit V

Largest Employers in the Industry



[4] The employee data for four firms in this chart were collected via LinkedIn. The remaining reflect the results of the interview process.

Part I: Infrastructure

Infrastructure providers offer blockchain node infrastructure services and developer tools. Their prospective customers are those looking to outsource the more resource-intense aspects of running a digital asset and blockchain business that require access to blockchain node data. Companies that require a constant stream of node data include decentralized applications (dApps) and on-chain data and analytics providers.

Infrastructure providers serve as the bedrock upon which many businesses build their services. Exhibit VI provides a high-level visualization of where infrastructure providers sit on the digital asset data value chain.

Exhibit VI

Data & Analytics	**dApps**
Querying & Indexing	
Infastructure	

Segmentation of Infrastructure Providers

Infrastructure providers can be segmented based on their target client base. While all 13 firms in our sample set offer enterprise client services, seven have explicitly targeted hobbyists and developers at early-stage startup businesses.

Exhibit VII

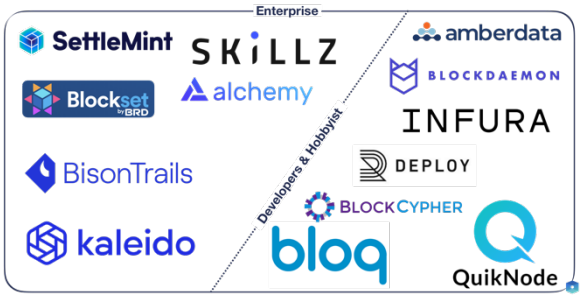
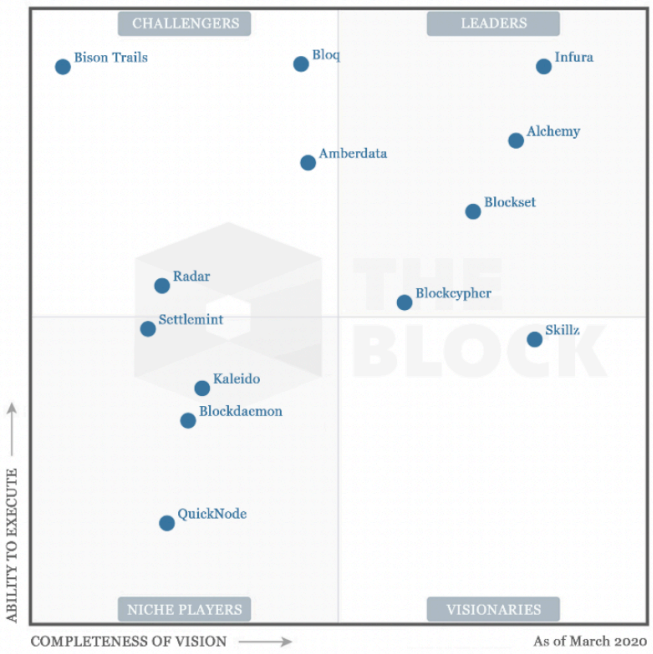


Exhibit VIII



Hobbyist Developers and Early-Stage Startups

Due to the nascency of the industry many clients that need access to the services infrastructure providers offer are either hobbyists looking to experiment with blockchains or early-stage startups.

One firm suggested that this client base is in the development stages of their business lifecycle and are the "grassroots" of the industry. The long-term strategic reasoning here is that, as solo developers and early-stage startups evolve into more mature sources of business, they will continue to utilize the services of familiar infrastructure providers. Those providers will, in turn, scale as their customers do.

Enterprises

As the digital asset industry becomes more institutionalized, the demand for enterprise-quality infrastructure will increase. Enterprise clients prioritize reliability in the infrastructures they build their businesses on. Due to the high costs associated with maintaining a comprehensive infrastructure operation, enterprises may want to leverage the cost advantages that infrastructure-focused businesses achieve with their economies of scale.

With this client base, the advantage for infrastructure businesses is their ability to upsell. On average, infrastructure providers charge their enterprise clients over 30 times what they charge their entry-level client base.

Pain Points & Challenges to Growth

While some businesses maintain their own node infrastructure, the resources required to hire skilled engineers, set up physical servers, and regularly maintain blockchain nodes can be too costly for many small-scale startups.

Firms that participated in this report said that, depending on the scale of an operation, spinning up an entire node infrastructure operation and maintaining the operation can cost clients between upwards of half a million per year to as much as two-million per year. Part of the high cost of maintenance can be attributed to the ever-changing nature of blockchains. To maintain an ongoing stream of reliable blockchain data for their clients, infrastructure providers must run archival nodes that retain a network's complete transaction history. As transactions are completed and consensus changes are made, the size and complexity of these nodes continue to rise, thus increasing the resource intensity of maintaining them.

Interviewed firms cited finding the right product-market fit as a challenge they often face and express concerns about the immaturity of the market. One firm noted that its sales and operations team have to compete with the do-it-yourself mentality of the blockchain community – particularly when it comes to prospective clients being asked to outsource vital elements of their operations.

Still, many infrastructure service providers believe that their efficiencies of scale and large feature suite can convince potential clients to outsource their infrastructure.

Market Leaders

The two infrastructure market leaders are Alchemy and Infura. Alchemy was founded in 2017 and has raised $15.7mm in venture financing. To date, it has on-boarded 170 companies despite only supporting three blockchain networks.

While firms like Bison Trails and Blockset have raised larger financing rounds and offer more blockchain network support, their feature sets are often too narrow or too wide. For example, Bison Trails is primarily focused on offering staking infrastructure support while the Blockset team has to maintain its popular wallet service, BRD, as well as its newly launched infrastructure business. While BRD began and remains a wholly-consumer facing product, Blockset is focused on bringing in mega enterprises through cooperation with partners in other parts of the infrastructure stack.

Infura is a well-known brand in the blockchain industry. Founded in 2017, the firm has since been acquired by the Ethereum development company ConsenSys. According to Infura's figures, in 2018 the firm handled 13 billion queries per day and at times made up between 5% to 10% of all Ethereum full nodes.[5] During our interviews, Infura was the most-cited competitor for companies in our sample set. One market participant estimated that Infura supports 70% of the top dApps in the Ethereum ecosystem. While Infura appears to be a clear leader in the current stages of the industry, its singular focus on supporting the Ethereum network might hurt its market leader status as the space continues to mature and clients begin to request support for a wider range of blockchain networks.

Addressable Market

Based on insights from companies interviewed by The Block, we estimate that the addressable market, calculated in annual revenue if 100% of available market is achieved, in 2019 was approximately $50mm. Industry insiders note that they believe this estimate does not take into account the addition of add-on fees that node infrastructure runners can generate from blockchains that support staking. One of the larger players in this vertical estimated that their firm will generate around $8mm in annual revenue by the end of 2020.

[5] The Race Is On to Replace Ethereum's Most Centralized Layer, CoinDesk.

Firm Comparison

Operations

Exhibit IX lays out the differences between each company's product suite.

69.2% of infrastructure provides are based in the United States and 84.6% have publicly disclosed venture funding. The most popular business model employed by these providers is a Software-as-a-Service model, in which clients are charged on a monthly basis to access the services provided. Over a third of firms also offer a sliding scale business model and charge clients based on usage, which is typically measured via API data calls.

On average, companies offer four paid pricing tiers. Each firm interviewed indicated that they're focused on enterprise clients. After enterprise clients, independent developers was the second most cited client target.

The wide price disparity between companies that charge for their services suggests that the sector is still in the process of discovering the best pricing models.

Product Suite and Feature Set

Exhibit X outlines the key differences across the various infrastructure provider's suite.

Shared node services – through which clients pull blockchain data from a cluster of nodes – is a fundamental service to each firm's offering. 75% of firms also offer dedicated node services, in which providers deploy exclusive nodes dedicated to each individual client.

Most firms are blockchain agnostic, offering support for multiple networks. The two firms that are blockchain-specific are Ethereum-focused, offering support for Ethereum-compatible networks such as IPFS and Chainlink. Both of the firms that are ethereum-focused are owned by ConsenSys, the venture studio. On average, blockchain agnostic firms offer support for over five networks.[6]

Exhibit IX

	Operation		Business Model						Target Client	
Firm	HQ	Funding ($ mm's)	SaaS	Sliding Scale	Free Tier	Paid Tier	Lowest Price	Highest Price	Developer	Enterprise
alchemy	USA	$15.7	✗	✓	N/A	N/A	N/A	N/A	✗	✓
amberdata	USA	2.3	✓	✓	✓	4	$50/mo	$2,799/mo	✓	✓
BisonTrails	USA	30.8	✓	✗	✗	N/A	N/A	N/A	✗	✓
BLOCKCYPHER	USA	3.2	✓	✗	✓	7	$100/mo	$2,600/mo	✓	✓
BLOCKDAEMON	USA	6.0	✓	✓	✗	3	$15/mo	$149/mo	✓	✓
Blockset by BRD	Switzerland	54.8	✓	✗	✗	4	$20/mo	$100,000/mo	✗	✓
bloq	USA	4.0	✓	✗	✓	5	$4/mo	$6,000/mo	✓	✓
INFURA	USA	Private	✓	✗	✓	4	$50/mo	$1,000/mo	✓	✓
kaleido	USA	Private	✓	✓	✓	4	$49/mo	Per Size	✗	✓
QuikNode	EU	0.5	✓	✗	✓	5	$10/mo	$900/mo	✓	✓
DEPLOY	USA	13.3	✓	✓	✓	2	$750/mo	Per Size	✓	✓
SettleMint	EU	6.0	✓	✗	✗	3	$1,100/mo	$2,670/mo	✗	✓
SKILLZ	EU	1.1	✓	✗	✗	N/A	N/A	N/A	✗	✓

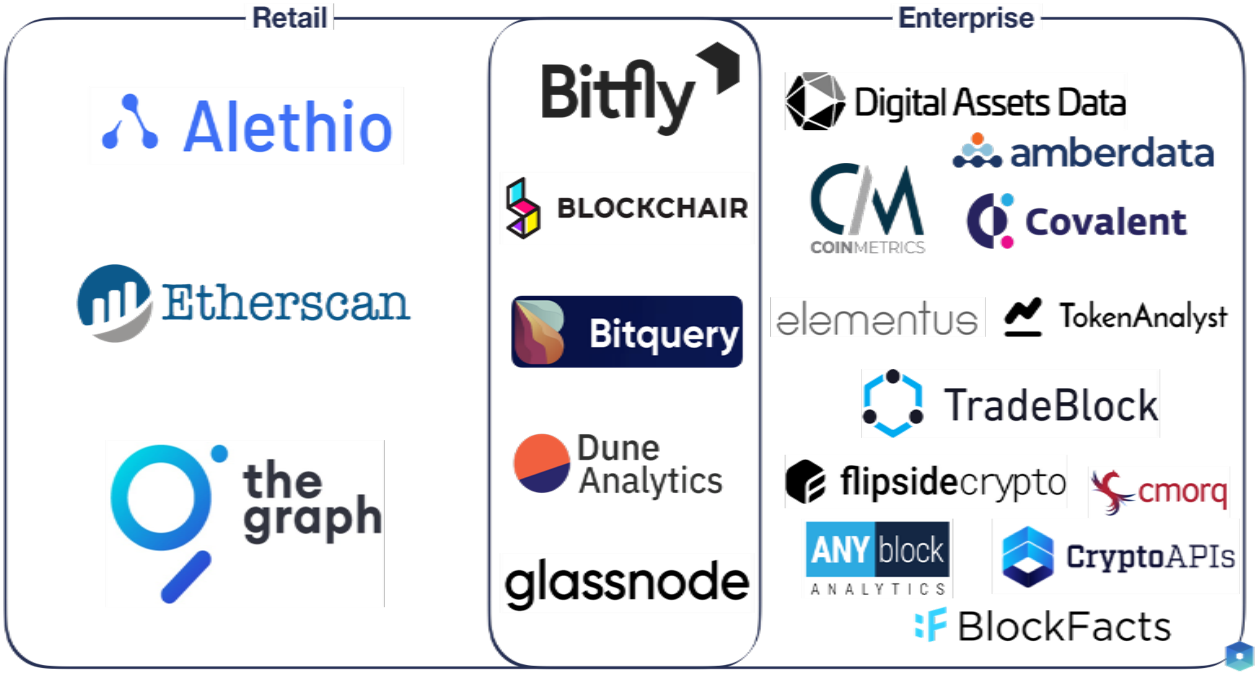
[6] The Blockdaemon was removed from the average calculation as the number of networks it supports appears to be an outlier. If included in the calculation, the average number of networks blockchain agnostic firms support is would be greater than seven.

Exhibit X

	Nodes				Client Tools				
Firm	Shared	Dedicated	Blockchain Agnostic	Supported Networks	REST API	SDK	Webstock	JSON-RPC	Dashboard
alchemy	✓	✓	✓	3	✓	✓	✓	✓	✓
amberdata	✓	✓	✓	10	✓	✓	✓	✓	✓
BisonTrails	✓	N/A	✓	9	N/A	N/A	N/A	N/A	✓
BLOCKCYPHER	✓	✗	✓	3	✓	✓	✓	✓	✓
BLOCKDAEMON	✓	✓	✓	30	✓	✓	✓	✗	✓
Blockset by BRD	✓	✓	✓	7	✓	✓	✓	✓	✗
bloq	✓	✓	✓	6	✓	✓	✓	✓	✓
INFURA	✓	✗	✗	2	✓	✗	✓	✓	✓
kaleido	✓	✗	✗	3	✓	✓	✓	✓	✓
QuikNode	✓	✓	✓	2	✓	✗	✓	✓	✗
DEPLOY	✓	✓	✓	2	✓	✓	✓	✓	✓
SettleMint	✓	✓	✗	4	✓	✓	✓	✓	✓
SKILLZ	✓	✓	✓	6	N/A	N/A	N/A	N/A	✓

Part II: On-chain Metrics

Exhibit XI



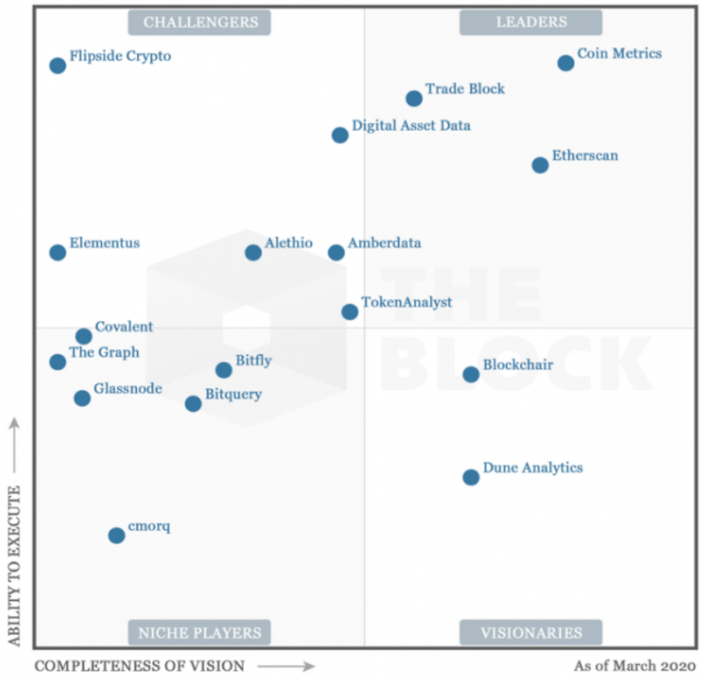
On-chain Metrics Providers

While the data produced by blockchains are publicly accessible, procuring actionable insights from the data requires additional work. Blockchain nodes need to be maintained and the raw data must be extracted, parsed, and cleaned. On-chain metrics providers offer services that change raw and unorganized blockchain data into user-friendly and digestible data. Many of these firm deploy a wide array of algorithmic strategies to digest and synthesize into metrics such as transaction counts, exchange flows, and value settled.

Segmentation of On-chain Metrics Providers

On-chain metrics providers can be segmented based on their target client-base. A majority of firms (61.1%) in our on-chain metrics sample set exclusively targets enterprise clients. Some of the firms in our sample offer services for a retail consumer and hobbyist developer clientele.

Exhibit XII



Retail and Hobbyists

Retail and hobbyist-focused providers have a diverse suite of offerings. Some firms offer services that are as simple as a blockchain explorer which consumers can use to track transactions and download high-level blockchain statistics such as supply growth, block size, and network difficulty. Other firms, like Glassnode and The Graph, provide more in-depth data services for viewing and extracting structured blockchain data such as custom on-chain indicators (ex: Coin Days Destroyed) and dApp-specific data queries.

Enterprises

Unlike infrastructure providers that target the engineering segment of their enterprise client base, on-chain metric providers target financial services segments such as research companies, hedge funds, institutional investors, and macro traders. Enterprise clients look for on-chain metrics products that have high quality control and validation. Because nodes often produce terabytes of data, firms' ability to provide accurate, well-organized, and robust metrics and analytics are a large value-add for potential clients.

Pain Points & Challenges to Growth

Similar to infrastructure providers, providers of on-chain metrics incur high operational costs related to blockchain data storage, node maintenance, further complicated as blockchains evolve through various network upgrades, and hiring experienced developers and analysts to properly extract data. On the lower end of the cost spectrum, annual server expenses are in the tens of thousands of dollars, according to interview participants. For providers with a wider range of blockchain coverage and associated feature sets, server costs can be in the mid-six figure range per year.

Separately, product-market fit is another challenge on-chain metrics providers face. One firm cited the general aversion of digital asset users and investors to pay for products and an overall lack of maturity in the industry. Another company cited the difficulty in maintaining and growing investor confidence in the industry, hinting that many investors are still not sure about digital assets as investable assets in the long-term.

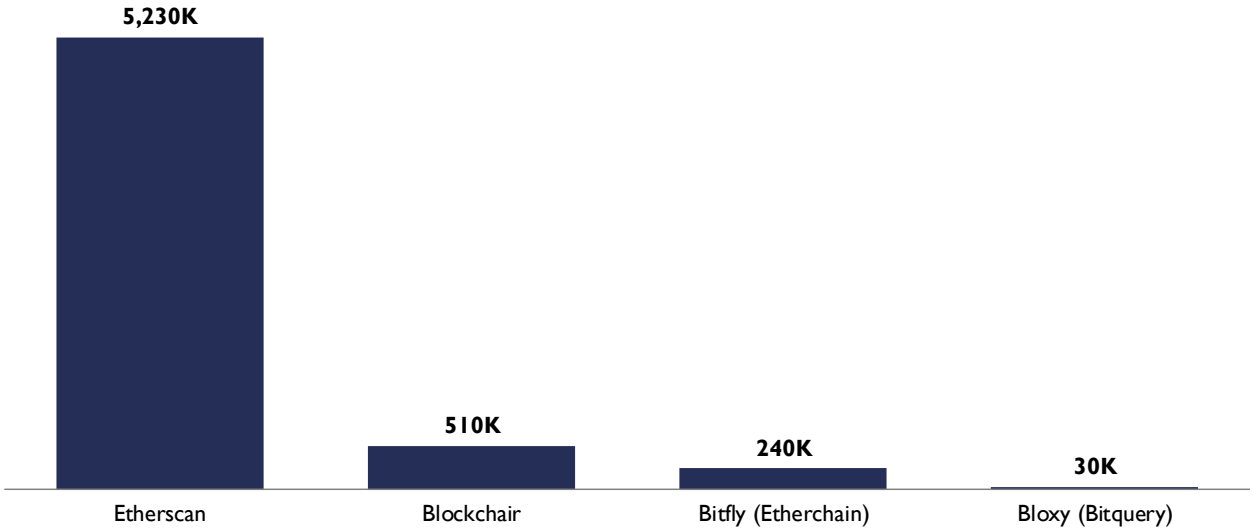
Many industry participants also acknowledge the likelihood of commoditization of blockchain data. Some believe that companies in the sector will soon need to find ways to provide additional value beyond just raw blockchain data. A couple firms cite the ability of individuals to customize their own data queries as one value-add.

Firms like Dune Analytics and Digital Assets Data have already begun offering these custom querying features. Data analytics could become loss leaders for companies to acquire clients and upsell them on additional features like blockchain monitoring, where they monitor blockchains and smart contracts for abnormalities.

We've seen this start to take shape in products like Blocknative, which enables users to set custom alerts for distinct mempool activities.

Exhibit XIII

Web Traffic of On-Chain Data Providers



Market Leaders

For retail clients, Etherscan appears to be the clear market leader in terms of usage and brand as shown in Exhibit XIII which shows a chart of retail-servicing on-chain data providers with significant web traffic.[7]

Etherscan has essentially become the go-to blockchain explorer for a majority of Ethereum retail users. We attribute this market dominance to Etherscan's early market entry. Etherscan was founded in 2015, two years earlier than its closest competitor, Blockchair. The firm has only raised $500k.

The market leader for enterprise-focused on-chain metrics providers is unclear. Flipside Crypto is a leader in terms of venture funding, having raised a total of $11.5mm. In terms of brand establishment, Coin Metrics appears to take the market lead.[8]

In terms of first-mover advantage, TradeBlock launched in 2013, giving it a four-year advantage over its oldest competitors. None of the firms in our sample set disclosed the size of their customer base or revenue figures.

Addressable market

Firms tell The Block that the serviceable market is in the low to mid-tens of millions of dollars. The sector is small and is increasingly crowded, and, as previously mentioned, it is possible that blockchain analytics will soon be commoditized.

One industry participant estimated that total annual spend for on-chain metric provider services is approximately $10mm per year.

[7] SimilarWeb.

[8] Based on Twitter follower count. We do note that none of firms have garnered enough significant web-traffic for SimilarWeb to produce results.

Firm Comparisons

Exhibit XIV shows a table of on-chain metrics providers in our sample set.

55.5% of on-chain metrics providers are based in the United States and 72.2% have publicly disclosed venture funding. The most popular business model utilized by these providers is a Software-as-a-Service model, in which clients are charged on a monthly basis to access the services provided. Firms also offer sliding scale business models, charging clients based on data usage, consulting services, and advertisement offerings.

On average, firms offer two pricing tiers for their paid products with prices ranging from $29 per month to $5,000 per month. Compared to infrastructure providers, a higher percentage of on-chain metrics providers offer free tiers for users to test their products.

Like infrastructure providers, most on-chain metrics providers are focused on enterprise clients. However, unlike infrastructure providers, on-chain metrics providers primarily target investors and researchers instead of businesses that are building on blockchains.

77.8% of on-chain metrics providers are blockchain agonistic, providing data services for more than one blockchain network. On average, these firms offer support for 14 blockchain networks. The most popular way on-chain metrics providers deliver their data is via a native dashboard or via APIs. Other delivery methods include SQL queries and CSV data downloads.

Exhibit XIV

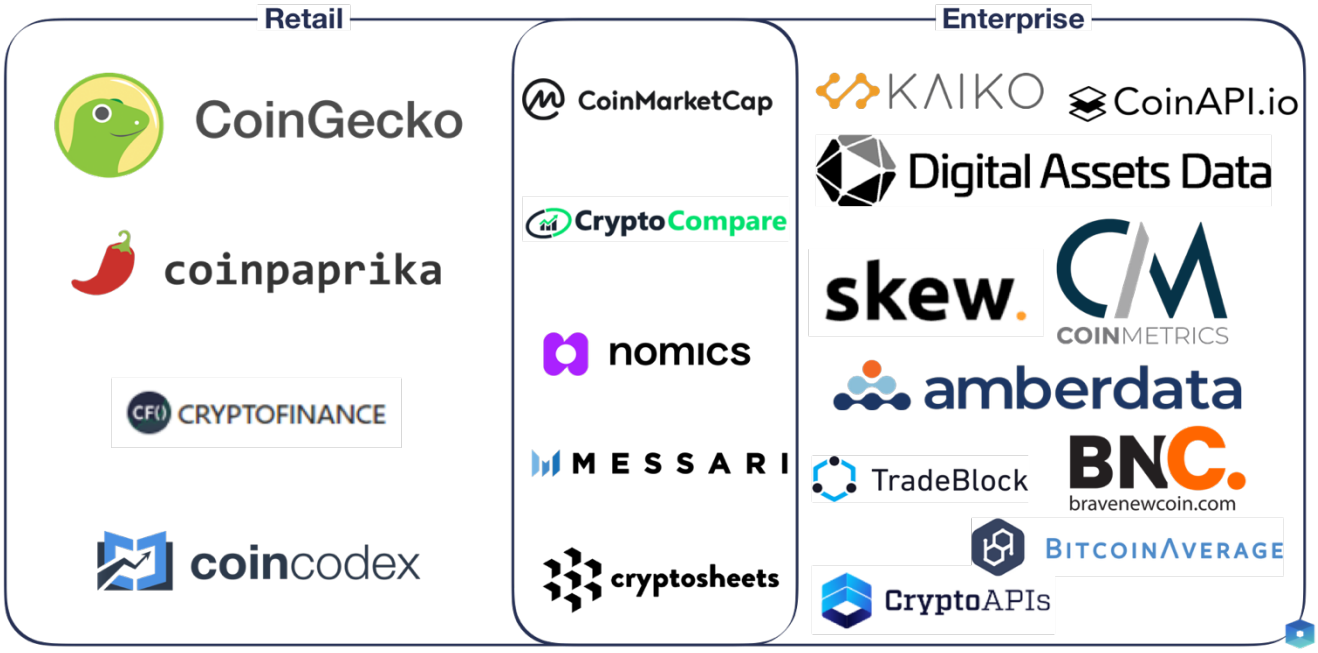
	Operation		Business Model							
Firm	Headquarters	Funding ($ mm's)	SaaS	Sliding Scale	Consulting	Advertising	Free Tier	Paid Tier	Lowest Price	Highest Price
Alethio	USA	Private	✓	✓	✗	✗	✓	3	N/A	N/A
amberdata	USA	$2.3	✓	✓	✓	✗	✓	4	$50	$2,799
ANYblock Analytics	EU	0.6	✓	✗	✓	✗	✓	3	220	499
Bitfly	EU	Private	✗	✗	✓	✗	✓	N/A	N/A	N/A
BLOCKCHAIR	Russia	Private	✗	✓	✓	✓	✓	N/A	N/A	N/A
Bitquery	USA	Private	✓	✓	✗	✗	✓	3	50	5,000
cmorq	USA	0.3	✓	✗	✓	✗	N/A	N/A	N/A	N/A
CM	USA	7.9	✗	✗	✗	✗	✓	N/A	N/A	N/A
Covalent	Canada	0.8	✓	✓	✗	✗	N/A	2	N/A	N/A
Digital Assets Data	USA	9.5	✓	✗	✗	✗	N/A	2	N/A	N/A
Dune Analytics	Norway	0.3	✓	✗	✗	✗	✓	1	1,000	1,000
elementus	USA	4.3	✓	✗	✓	✗	✗	N/A	N/A	N/A
Etherscan	APAC	0.5	✗	✗	✗	✓	✓	N/A	N/A	N/A
flipsidecrypto	USA	11.5	✓	✗	✗	✗	✓	N/A	N/A	N/A
glassnode	Switzerland	Private	✓	✗	✗	✗	✓	2	29	599
The Block	USA	4.5	✗	✗	✗	✗	✓	N/A	N/A	N/A
TokenAnalyst	UK	1.0	✓	✗	✗	✗	✓	2	799	799
TradeBlock	USA	2.9	✓	✗	✓	✗	✓	0	N/A	N/A

Exhibit XV

	Target Client		Nodes		Client Tools				
Firm	Retail	Enterprise	Blockchain Agnostic	Supported Networks	Rest API	Websocket	SQL	CSV	Dashboard
Alethio	✓	✗	✗	1	✓	✓	✗	✗	✓
amberdata	✗	✓	✓	10	✓	✓	✗	✓	✓
ANYblock Analytics	✗	✓	✓	3	✓	✓	✓	✗	✓
Bitfly	✓	✓	✓	4	✓	N/A	N/A	N/A	✗
BLOCKCHAIR	✓	✓	✓	13	✓	N/A	✓	✓	✗
Bitquery	✓	✓	✓	20	✓	N/A	N/A	✗	✓
cmorq	✗	✓	✓	50	✓	N/A	N/A	✓	✓
CM	✗	✗	✗	40	✓	✗	✗	✗	✗
Covalent	✗	✓	✓	N/A	✓	✓	✓	✗	✓
Digital Assets Data	✗	✓	✓	40	✓	✓	✗	✓	✓
Dune Analytics	✓	✓	✗	1	✗	✗	✓	✓	✓
elementus	✗	✓	✓	2	✓	✓	✗	✗	✓
Etherscan	✓	✗	✗	1	✓	✓	✗	✓	✗
flipsidecrypto	✗	✓	✓	30	✓	✓	✗	✓	✓
glassnode	✓	✓	✓	4	✓	✗	✗	✗	✓
the graph	✓	✗	✗	1	✗	✓	✗	✗	✗
TokenAnalyst	✗	✓	✓	5	✓	✓	✗	✓	✓
TradeBlock	✗	✓	✓	15	✓	✓	✗	✓	✓

Part III: Market Data

Exhibit XVI



Market Data Providers

Unlike equity markets, where spot trading data comes exclusively from NASDAQ and NYSE and the majority of derivatives data comes from a handful of financial markets companies (CME Group, Intercontinental Exchange or CBOE), available market data in the digital asset ecosystem is fragmented across a number of different digital asset exchanges.

There are at least 20 legitimate digital asset exchanges[9] – some global and some regional – that have real volume and sufficient liquidity to make them worth tracking. Each digital asset exchange has its own API with different degrees of documentation, which means that the data needs to be normalized and pre-processed for the data to be comparable across different exchanges. There's also a large distribution of rate limits across different digital asset exchanges.

Exhibit XVII

Exchange	Public rate limit (requests per minute)
KuCoin	1,800
Binance	1,200
Bitstamp	800
OKEx	360
Poloniex	360
Coinbase	180
Gemini	120
Bitfinex	90
Bittrex	60
Kraken	60
Liquid	60
CEX.io	60
Huobi	10

[9] Introducing 'The Block 22'.

The exchanges in equity markets charge significant fees to access their data, which is not the case for digital asset exchanges. Instead, they typically distribute market data for free for personal use though REST and Websocket APIs. While most of the digital asset exchanges provide historical trade data, they don't provide historical order book data and historical OHLCV data.

Market participants seek digital asset market data providers primarily for a few reasons. The first is to aggregate all of the exchange APIs into one comprehensive API. The second reason is to access sets of pre-processed historical data (order book and OHLCV). Neither is possible through the digital asset exchange APIs and, as a result, are valuable for quantitative or algorithmic traders, hedge funds, investment management firms and investment banks.

Segmentation of market data providers

Market data providers can be separated into two categories based on which customers they serve: retail and enterprise. Some companies serve both customer groups.

Retail

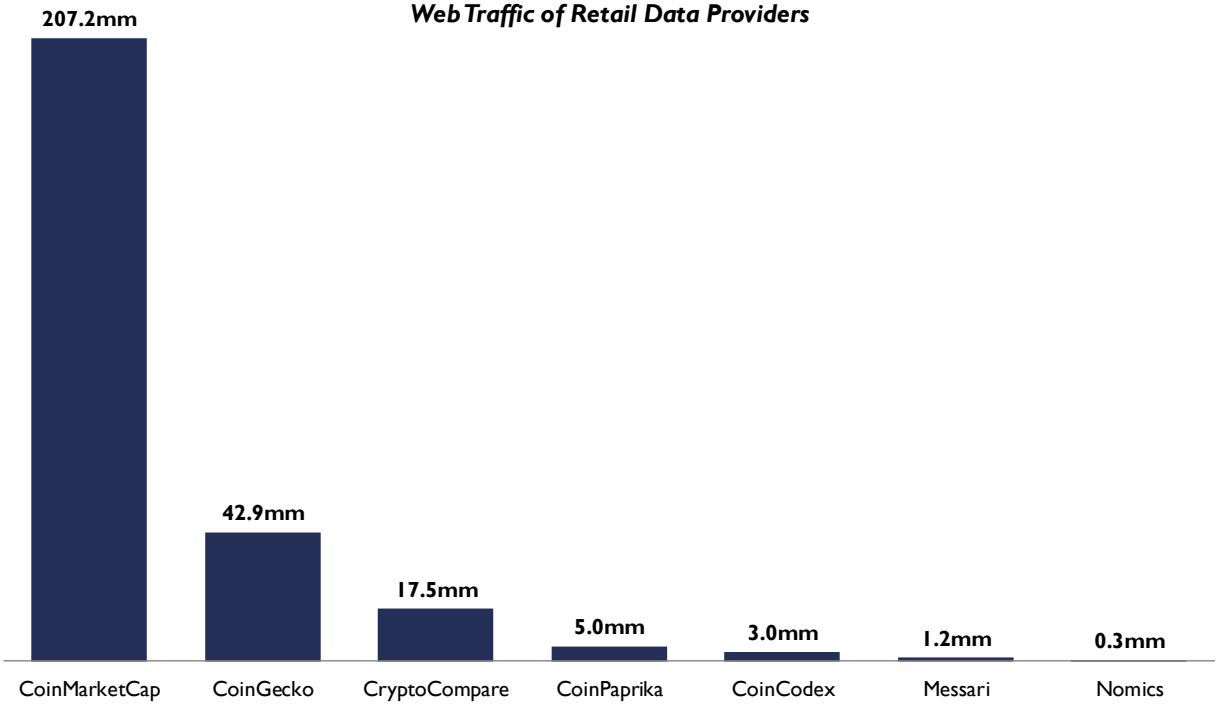
Unlike other asset classes, interest in digital assets is largely driven by retail customers – especially during the industry's initial stages. While the overall composition of market participants has become increasingly enterprise focused during the last few years, retail-facing platforms proliferated early and, in some cases, became profitable businesses.

Retail-serving providers generally support a greater number of exchanges and aggregate all of the data in a simple customer-facing dashboard. The majority of retail-facing platforms don't collect order book and trade data and instead, focus on price levels and volumes. However, these providers do not pre-process the data and as a result, generally can't be utilized or relied on by professionals. Similarly, the price indices designed by retail-facing platforms are often not robust enough to for that audience.

As of March 2020, The two largest retail-facing providers, CoinMarketCap and CoinGecko, employ 34 and 15 people, respectively. Prior to CoinMarketCap's acquisition, neither of the firms

Exhibit XVIII

Web Traffic of Retail Data Providers



had raised any outside capital as they were bootstrapped in 2013 and 2014 and gradually attracted more traffic and became profitable from ads.

Retail-facing platforms make the largest portion of their revenue from ads, which means that traffic is likely their most important metric of success. CoinMarketCap is, by far, the most visited retail-facing data site over the last six months, according to data from SimilarWeb[10]. CoinMarketCap saw 207.2 million visits from October 2019 to March 2020, nearly five times more than CoinGecko, which saw 42.9 million visits.

Pain Points & Challenges to Growth

Retail-facing data providers generally need to integrate with hundreds of exchanges and there is no standard API format, which necessitates custom integrations for each exchange. In addition, exchanges frequently change their API and the integrations need to be updated as a result. This takes a significant amount of time.

Another common issue is the need to normalize ticker symbols for each asset. Many digital assets are identified by different symbols on different exchanges which, when comparing assets, require an adjustment. Moreover, there are assets that have the same symbol, which cannot be adjusted seamlessly. Firms reported that instead, each one needs to be audited manually to avoid discrepancies.

Addressable market

The addressable market for purely retail-facing platforms is limited by the number of retail customers in the space.

Since early 2018 – when the number of retail customers peaked – growth of ad-driven businesses has stagnated as a result of an aggregate decrease in traffic. CoinMarketCap entered the events business in 2019. CryptoCompare has an enterprise SaaS offering and also organizes events. CoinPaprika recently released their own digital asset exchange focused on European markets.

Outlook

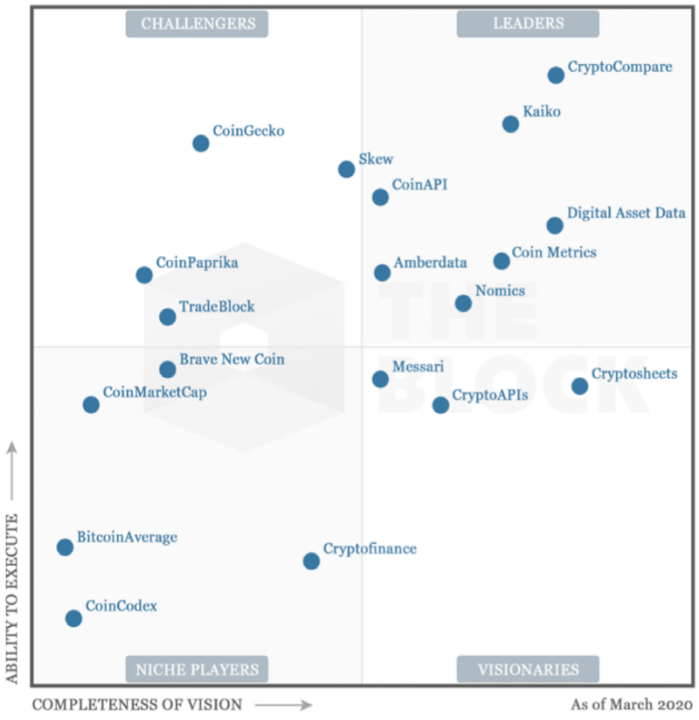
With the growth of futures and options markets, retail-facing data providers will start to fully integrate derivatives data and become more sophisticated. Diversified revenues will continue to grow in popularity and more retail-facing providers will explore serving an enterprise clientele as well.

Largest players

The largest enterprise-serving market data providers in terms of revenue are Kaiko and CryptoCompare.

Kaiko, based in France, was founded in 2014 and has one of the largest normalized historical data sets for both order book data and trade data. Unlike some of their competitors, Kaiko is a purely focused on serving market data to capital market companies and enterprises. U.K.-based CryptoCompare, also founded in 2014, is slightly cheaper but still serves data on par with Kaiko's offering. Unlike Kaiko, CryptoCompare has a retail-facing arm that monetizes through events ads on its website. Kaiko

Exhibit XIX



[10] SimilarWeb.

and CryptoCompare have the best combination of breath and granularity of data.

CoinAPI has a compelling offering as well, especially when it comes to historical tick data, but is more popular among developers while Kaiko and CryptoCompare target financial institutions.

Companies such as Digital Asset Data (DAD), Coin Metrics and Amberdata have entered the market data sector relatively recently and are primarily focusing on on-chain data. While they are not quite on par with Kaiko, CryptoCompare and CoinAPI in terms of historical breadth, they already serve normalized data with low latency, minimal down-time and error-checking and are poised to catch up. DAD, Coin Metrics and Amberdata also provide dashboards through which clients can visualize data.

Exhibit XX

Firm	Headquartered	Funding ($ mm's)	Year Est.	Number of Employees
amberdata	USA	$2.3	2017	12
BITCOINAVERAGE	UK	Private	2013	3
BlockFacts	Serbia	Private	2018	6
BNC.	USA	0.5	2014	30
CM	USA	7.9	2017	22
CoinAPI.io	Poland	Private	2017	3
coincodex	Slovenia	Private	2017	5
CoinGecko	Malaysia	Private	2014	15
CoinMarketCap	Remote	Acquired	2013	34
coinpaprika	Poland	–	2018	14
CryptoAPIs	Bulgaria	Private	2018	20
CryptoCompare	UK	Private	2014	35
CRYPTOFINANCE	Netherlands	Private	2018	2
cryptosheets	USA	Private	2018	4
Digital Assets Data	USA	9.5	2018	24
KAIKO	France	5.5	2014	16
MESSARI	USA	6.0	2018	13
nomics	USA	3.0	2017	6
skew.	UK	2.0	2018	9
TradeBlock	USA	2.9	2013	12

Pain Points & Challenges to Growth

Enterprise-serving data providers often quote data normalization as their biggest challenge, as a result of exchanges using vastly different data formats. Exchanges also frequently change their API formats, which means that integrations need to be adjusted on an ongoing basis.

Data providers also struggle with finding the right balance between the redundancy and cost-effectiveness of their data structure, which is often described as a multi-year process. First movers also had to educate potential clients about the importance of different types of data.

Costs

The most significant cost, by far, is labor. Salaries and wages are the major line-item expense for data providers. The base salary of data engineers or data scientists, who comprise more than 80% of personnel, starts at $90,000 and goes up to $160,000 a year depending on location.

In addition, hosting historical trade and order books takes a lot of storage (hundreds of terabytes), which drives up overhead costs and makes it a significant barrier of entry for new companies.

Addressable market

Based on the total willingness to spend among all addressable market participants, the total size of the market for enterprise-serving market data providers was about $40 million in 2019 according to market participants. To put things in perspective, that equates to an average spend of $20,000 per year and 2,000 market participants.

However, with growing institutional interest and the potential of the digital asset market, both the number of market participants and the spend per company will likely increase significantly. The Block anticipates total spend to increase by at least 50% to in 2020.

Outlook

Even after a 50% increase to the serviceable market in 2020, the industry will still have a long way to go.

For context, FactSet, a financial data company, reported revenues of $1.44bn in 2019. The long-term potential of the market opportunity is why some companies, such as CryptoCompare, have

diversified revenue models with enterprise-facing products supplemented by events or advertisements.

In the short term, growth will continue to be driven by capital allocators and speculators, such as hedge funds and family offices that fit bitcoin in their global macro strategy. Over the long term, there will be three sources of growth:

- Heightened focus, and associated investment, from traditional asset managers
- Continued development of decentralized finance (DeFi) or open finance applications built on Ethereum
- Potential adoption of security tokens

Security tokens, securities in a digital form, could trade on new security token exchanges rather than the NASDAQ or the NYSE. Companies like Kaiko or CryptoCompare would be well-positioned to capture a large portion of the market.

A developing trend: enterprise-facing data providers adding robust support for the derivatives markets. So far, the focus has largely been on the spot markets but that continue to change. New companies, such as Skew, are almost exclusively focused on derivatives markets, but also specialize in increasing professionals' understanding of flows.

Another trend that will continue to grow is the interest in data dashboards. These dashboards help users visualize and identify happenings quicker. This ability helps users make decisions faster, while also developing some level of loyalty for the data provider's dashboard.

Enterprise

With the institutionalization of the digital asset space in 2019, the demand for enterprise-quality data is increasing rapidly. The Bitcoin market's financial infrastructure has matured drastically, especially with the expanded participation in derivatives, but also with the proliferation of custody solutions. These solutions attract the liquidity required for larger institutions to step into the market. Since 2019, Bitcoin has become one of the tools that macro traders consider for hedging.

Enterprise-serving data providers are a completely different category than the retail-serving providers, given the vastly different set of requirements. With that said, the target clients for enterprise level market data is still quite broad. Starting from the lower end of the average revenue per user, the userbase is composed of research firms, universities, developers (apps and websites), algorithmic and global macro traders, hedge funds, fiduciaries, professional service providers (accounting and tax

Exhibit XXI

	Delivery					Data Type				
Firm	Rest API	CSV	FIX API	WebSocket	Dashboard	Trade Data	Order Book	OHLCV	Normalized	Index Provider
amberdata	✓	✗	✗	✓	✓	✓	✓	✓	✓	✗
BitcoinAverage	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓
BlockFacts	✓	✗	✗	✓	✗	✓	✗	✓	✓	✗
BNC.	✓	✗	✗	✗	✗	✗	✗	✓	✓	✓
CM	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
CoinAPI.io	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗
coincodex	✓	✗	✗	✗	✓	✗	✗	✓	✗	✓
CoinGecko	✓	✓	✗	✗	✓	✗	✗	✓	✗	✓
CoinMarketCap	✓	✓	✗	✗	✓	✗	✗	✓	✗	✓
coinpaprika	✓	✗	✗	✗	✓	✗	✗	✓	✗	✓
CryptoAPIs	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗
CryptoCompare	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CRYPTOFINANCE	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗
cryptosheets	✓	✓	✗	✗	✓	✗	✗	✓	✗	✗
Digital Assets Data	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗
KAIKO	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓
MESSARI	✓	✓	✗	✓	✓	✓	✗	✓	✓	✓
nomics	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓
skew.	✗	✓	✗	✗	✓	✓	✗	✗	✓	✗
TradeBlock	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓

Exhibit XXII

Name	Firm	Headquartered	Funding ($ mm's)	Year Est.	Number of Employees	Twitter Followers (K's)	Business Model			Target Client	
							Saas	Ads	Events	Retail	Enterprise
Amberdata	amberdata	USA	$2.3	2017	12	1.9	✓	✗	✗	✗	✓
BitcoinAverage	BitcoinAverage	UK	Private	2013	3	6.9	✓	✗	✗	✗	✓
BlockFacts	BlockFacts	Serbia	Private	2018	6	0.3	✓	✗	✗	✗	✓
Brave New Coin	BNC.	USA	0.5	2014	30	39.9	✓	✓	✗	✗	✓
Coin Metrics	CM	USA	7.9	2017	22	22.8	✓	✗	✗	✗	✓
CoinAPI	CoinAPI.io	Poland	Private	2017	3	–	✓	✗	✗	✗	✓
CoinCodex	coincodex	Slovenia	Private	2017	5	10.5	✗	✓	✗	✓	✗
Coingecko	CoinGecko	Malaysia	Private	2014	15	40.9	✗	✓	✗	✓	✗
CoinMarketCap	CoinMarketCap	Remote	Acquired	2013	34	539.6	✓	✓	✓	✓	✓
CoinPaprika	coinpaprika	Poland	–	2018	14	7.6	✗	✓	✗	✓	✗
Crypto APIs	CryptoAPIs	Bulgaria	Private	2018	20	1.7	✓	✗	✗	✗	✓
CryptoCompare	CryptoCompare	UK	Private	2014	35	25.3	✓	✓	✓	✓	✓
CryptoFinance	CRYPTOFINANCE	Netherlands	Private	2018	2	0.1	✓	✗	✗	✓	✗
CryptoSheets	cryptosheets	USA	Private	2018	4	0.1	✓	✗	✗	✓	✓
Digital Assets Data	Digital Assets Data	USA	9.5	2018	24	0.0	✓	✗	✗	✗	✓
Kaiko	KAIKO	France	5.5	2014	16	3.5	✓	✗	✗	✗	✓
Messari	MESSARI	USA	6.0	2018	13	33.8	✓	✓	✓	✓	✓
Nomics	nomics	USA	3.0	2017	6	8.6	✓	✓	✗	✓	✓
Skew	skew.	UK	2.0	2018	9	15.4	✓	✗	✗	✗	✓
TradeBlock	TradeBlock	USA	2.9	2013	12	12.2	✓	✗	✗	✗	✓

advisers), liquidity providers (market makers, brokers and exchanges), investment management firms and investment banks.

Simply put, clients want the same tooling that they're familiar with in other markets, whether equity, debt, foreign exchange or commodities. These users require trade data, as well as order book data, served with low latency, no down-time, normalization, two-way persistent connection and error-checking. As a result, enterprise clients don't prioritize the number of exchanges a provider supports but instead, focuses on providers with robust support for the exchanges with real volumes and deep liquidity.

More demanding clients need real-time dashboards as well as alerts tailored to their specific signals. Some clients seek multi-year historical order book data in order to backtest their model or strategies.

The main business model is market data as a service (SaaS). Most of the companies offer two to three subscription tiers based on rate limiting and granularity of data. Other than subscriptions, the majority of data providers also sell custom one-off data dumps to enterprise clients.

Price indices

A robust price index is a necessity for any trader or investment manager building products on top of digital assets. A poorly structured price index can be manipulated by exploiting momentary weaknesses at the underlying spot exchanges. It could also result in invalid liquidations in the derivative markets.

Case Study

On May 17, 2019, a trader placed a 4,300 BTC sell-order on Bitstamp, which triggered a six-point market sell-off and the liquidation of $250 million worth of long positions on derivatives exchange BitMEX because of a poorly designed index.

Half of the BitMEX's index at the time was consisted of Bitstamp's spot price, even though Bitstamp's traded volume was multiple times lower than BitMEX's volume itself.

Different spot exchanges opt for different parameters to keep orders from having too big of an impact on their market but there is no one solution to ensure prevention. Exchanges' efforts include speed bumps, support for hidden orders (to absorb flash market movement), maximum order sizes, thresholds to place a large order or market cooldown periods.

A robust price index should be resistant to manipulation by using weighted-average and dynamic exclusion criteria, which can automatically spot a price outlier and exclude it from the calculation. A robust index weighs prices differently depending on several variables including volume, liquidity (measured as order book depth), as well as historical deviation from the median.

If an exchange has low liquidity at any moment, increasing the impact of a quick price change, prices are weighted by much less or completely excluded from the index calculation. To prevent falsely passing the liquidity test, robust indices also check whether an order book is not delayed to prevent falsely passing the liquidity test.

The business model for indexing includes a relatively small upfront fee and then a revenue share. CryptoCompare, Brave New Coin, TradeBlock, Kaiko, Deribit and CME provide institutional-grade indices.

Exhibit XXIII

	Pricing				
Firm	Free Tier	Paid Tiers	Lowest Price	Highest Price	# of Exchanges
amberdata	✓	4	$50/mo	$2,799/mo	15+
BitcoinAverage	✗	4	$12/mo	$599/mo	60+
BlockFacts	✓	3	$99/mo	Per Size	20+
BNC.	✓	1	$200/mo	-	200+
CM	✗	1	-	Per Size	25+
CoinAPI.io	✓	4	$79/mo	Per Size	270+
coincodex	✓	0	-	-	200+
CoinGecko	✓	0	-	-	380+
CoinMarketCap	✓	5	$29/mo	Per Size	310+
coinpaprika	✓	0	-	-	300+
CryptoAPIs	✓	5	$75/mo	Per Size	15+
CryptoCompare	✓	3	$80/mo	Per Size	250+
CRYPTOFINANCE	✓	1	$10/mo	-	190+
cryptosheets	✓	4	$29/mo	Per Size	200+
Digital Assets Data	✗	2	-	Per Size	200+
KAIKO	✗	2	-	Per Size	80+
MESSARI	✓	1	-	Per Size	40+
nomics	✓	1	$1,000/mo	Per Size	175+
skew.	✓	1	-	Per Size	20+
TradeBlock	✗	1	-	Per Size	10+

Mergers and Acquisitions

Binance's recent deal to acquire CoinMarketCap was the first major acquisition of a digital asset data provider, for a reported $400mm.[11] Binance took full ownership of CMC, but CMC will reportedly continue to be run as an independent entity.[12]

The acquisition is the third largest in the entire digital asset space—after the acquisitions of Poloniex and Bitstamp. CoinMarketCap draws a significant amount of traffic, even more than Binance, and it is suspected that it will serve as a marketing and client acquisition funnel for the exchange. Binance has also acquired a Chinese data startup DappReview, which tracks decentralized applications.

In early May 2020, TokenAnalyst announced it is shutting down, with some of the team joining Coinbase. It's not immediately clear whether the firm was acqui-hired or not.[13]

In January, Anchorage announced it acquired Merkle Data, a data company that specialized in liquidity assessment and asset pricing. In March 2017, Kraken acquired a charting and trading data platform Cryptowatch and hired the founder to lead the development of Kraken's interface. In January 2017, CoinDesk acquired a market data & investment tool Lawnmower and hired the entire team.

The recent institutionalization of the space, as well as the tougher fundraising environment partially attributed to the global COVID-19 pandemic, could lead to further consolidation in the digital asset data and infrastructure space.

Exhibit XXIV

Date	Target	Txn. Value	Buyer
Mar-20	CoinMarketCap	~$400mm	Binance
Jan-20	Merkle Data	<$20mm	Anchorage
Dec-19	DappReview	<$20mm	Binance
Mar-17	Cryptowatch	<$15mm	Kraken
Jan-17	Lawnmower	<$5mm	CoinDesk

[11] Binance is set to acquire CoinMarketCap.
[12] Binance and CoinMarketCap Announce Acquisition.
[13] Blockchain insights platform TokenAnalyst is shutting down.

Conclusion

Digital asset data is quite likely going to be one of the sub-sectors specific to the broader crypto space that is well poised to produce its own unicorns as within other ecosystems. To date, only exchanges, token development studios and mining chip manufacturers have built profitable companies and boast unicorn like valuations. Data and infrastructure companies would be a logical sector to follow.

Financial market data spend broke $30 billion in each of the last two years. The level of spend is the highest since 2008, according to a report published by Burton-Taylor[14]. Bloomberg controls about 33% of the total revenue, followed by Refinitiv, S&P Global Market Intelligence, Moody's Analytics and FactSet.

The consolidation of older financial market data vendors occurred over a few decades. The digital asset data industry will see their industry mature in a similar fashion. Healthy competition in the sector combined with COVID-19 related pressures could lead to an acceleration of this maturation, where we'll see data and infrastructure companies without differentiated product suites get acquired or become defunct. Nonetheless, with strong tailwinds generated by financial institutions, investors and fintech companies increasing Interest, the future looks bright for the digital asset data and infrastructure space.

[14] Burton-Taylor market data report.

Reference Material

1. Research report – employment trends in the digital asset industry commissioned by the Blockchain Association 23 January 2020

(https://www.theblockcrypto.com/post/53685/research-report-employment-trends-in-the-digital-asset-industry-commissioned-by-the-blockchain-association)

2. Research report – employment trends in the digital asset industry commissioned by the Blockchain Association 23 January 2020

(https://www.theblockcrypto.com/post/53685/research-report-employment-trends-in-the-digital-asset-industry-commissioned-by-the-blockchain-association)

3. 2019: a year in blockchain investment deals
02 January 2020

(https://www.theblockcrypto.com/genesis/51878/2019-a-year-in-blockchain-investment-deals)

4. The Race Is On to Replace Ethereum's Most Centralized Layer
05 December 2018

(https://www.coindesk.com/the-race-is-on-to-replace-ethereums-most-centralized-layer)

5. The employee data for four firms in this chart were collected via LinkedIn. The remaining reflect the results of the interview process.

6. Introducing 'The Block 22', an extension of 12 other exchanges on top of 'Bitwise 10'
18 December 2019

(https://www.theblockcrypto.com/genesis/50967/introducing-the-block-22-an-extension-of-12-other-exchanges-on-top-of-bitwise-10)

7. The Blockdaemon was removed from the average calculation as the number of networks it supports appears to be an outlier. If included in the calculation, the average number of networks blockchain agnostic firms support is would be greater than seven.

8. SimilarWeb

9. Based on Twitter follower count. We do note that none of firms have garnered enough significant web-traffic for SimilarWeb to produce results.

10. Binance is set to acquire CoinMarketCap, the deal could be worth as much as $400 million
31 March 2020

(https://www.theblockcrypto.com/post/60371/binance-is-set-to-acquire-coinmarketcap-the-deal-could-be-worth-as-much-as-400-million)

11. SimilarWeb

12. Binance and CoinMarketCap Announce Acquisition to Collectively Make Cryptocurrency More Accessible for Everyone
02 April 2020

(https://blog.coinmarketcap.com/2020/04/02/binance-and-coinmarketcap-announce-acquisition-to-collectively-make-cryptocurrency-more-accessible-for-everyone/)

13. Blockchain insights platform TokenAnalyst is shutting down
05 May 2020

(https://www.theblockcrypto.com/linked/64116/blockchain-insights-tokenanalyst-shutting-down)

14. Financial Market Data/Analysis Global Share & Segment Sizing 2017

(https://burton-taylor.com/product/financial-market-data-analysis-global-share-segment-sizing-2017/)

About

About BRD

BRD is a global company that's bringing blockchain-enabled financial services and infrastructure to the modern generation. Launched in 2015, and headquartered in Zurich, Switzerland, BRD is a venture-backed company that has raised $56mm from SBI Holdings, Ripple, and other top investors focused on banking, FinTech, and the blockchain. BRD is the maker of both Blockset by BRD for the enterprise market and the BRD mobile apps for consumers. Blockset is a new hosted blockchain infrastructure platform enabling enterprise development teams to build better applications at a fraction of the costs. The BRD mobile apps provide consumers with the simplest and most secure way to buy and protect bitcoin and other cryptocurrencies. With over 4 million customers worldwide, BRD has accumulated an estimated $6bn of crypto assets under protection and is one of the fastest growing blockchain-enabled finance apps for everyday consumers (a Top 10 Finance app in 71 countries).

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About The Block

The Block is an information services company founded in 2018. The Block, headquartered in New York, NY, produces research and journalism content that covers the digital asset, fintech and financial services industries.

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