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Internet 3.0 and the Next Wave of Innovation

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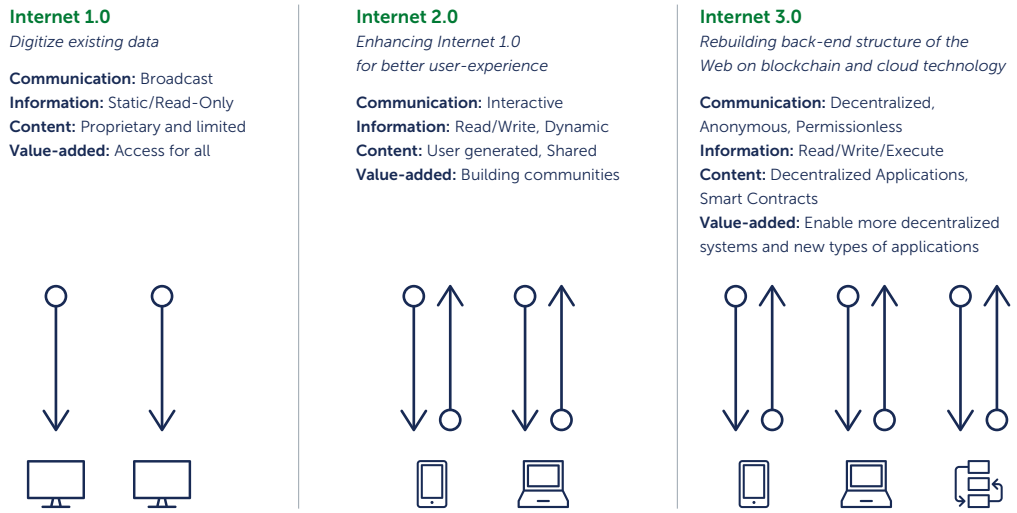
While Internet 3.0 promises significant disruption, it seems to be more of an evolution of Internet 2.0—and anyone writing off the winners of the Internet 2.0 era should be wary.

2020 was an eventful year for technology, marked not only by the pandemic and the resulting acceleration of the digitization mega-trend—but it was also the year that saw tipping points in popularity for new technologies that have the potential to undermine or even replace institutions that are the bedrock of the political and economic establishment.

With this backdrop as context, we take a closer look at the nature of the evolution from Internet 2.0—which enabled the explosive growth in user-created content and social media—toward Internet 3.0, which aims to create more open, connected and intelligent websites and web applications that focus on using a machine-based understanding of data. Ultimately, Internet 3.0 promises a more decentralized internet and a weakening of centralized power structures.

FIGURE 1: The Evolution of the Internet



SOURCES: Barings; Token Economy, Shermin Voshmgir. As of June 2021.

The 21st Century Data Renaissance

History shows that major technological disruptions contain some common features that provide clues as to how Internet 3.0 will disrupt today's world. The magnitude of the potential ramifications of Internet 3.0 could be enormous—and possibly even on par with some of history's greatest technological leaps. In fact, if we wind the clock back several hundred years, we can even see parallels with the 12th Century Renaissance[1]. Fueled in part by a technological disruption (the invention of the printing press), the Renaissance saw the centralized power of the Christian Church become undermined as the supply of written information became decentralized and access to information was dramatically improved. The more far-reaching impact was the wider dissemination of knowledge and all of the social and economic progress that followed.

In today's world, the equivalent of the printing press is the Public Cloud. The leading players, Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP), have succeeded in lowering the infrastructure costs for developers to build new types of applications. Even so, many companies today are still only about 20% through the migration of existing workloads to the Cloud[2]—and while Internet 3.0 based platforms boast of thousands of next generation applications[3], this remains tiny in the scheme of things.

1. The Renaissance of the 12th century refers to a period of several social, economic and political changes at the onset of the High Middle Ages.
2. Source: IBM. As of March 5, 2019.
3. Source: Ethereum.org

The Emergence of Internet 3.0 and Blockchains

Tim Berners-Lee named Internet 3.0, or Web3, the Semantic Web—the idea being that an internet built for machine-based understanding of data on the web can lead to a more open and connected internet. The variety of blockchain technologies underpinning cryptocurrencies are one way of designing the infrastructure required to achieve the aims of Internet 3.0 and are proving to be a source of intense development activity.

Blockchains are capable of creating "permissionless" markets and "trustless" transactions[4]. To use Bitcoin as an example, permission is not required as there is no governing body authorizing participants to take part. Bitcoin traders can be anonymous as no third party is required to establish trust in the transaction. Instead, the algorithms that define the rules for executing and recording transactions on the blockchain do that job.

Once the barriers of "trust" and "permission" are solved for, business processes and transactions can be carried out digitally and with significantly more automation. This idea sparked the development of a general-purpose blockchain called Ethereum[5], which enables developers to create distributed applications (dApps), including those with the ability to automate the execution of Smart Contracts[6]. A simple example of a smart contract would be a vending machine where dropping a coin in triggers the machine to provide a can of soda to the buyer. The shopkeeper has been disintermediated by the instruction (smart contract) attached to the coin (Ether) telling the machine to release the soda.

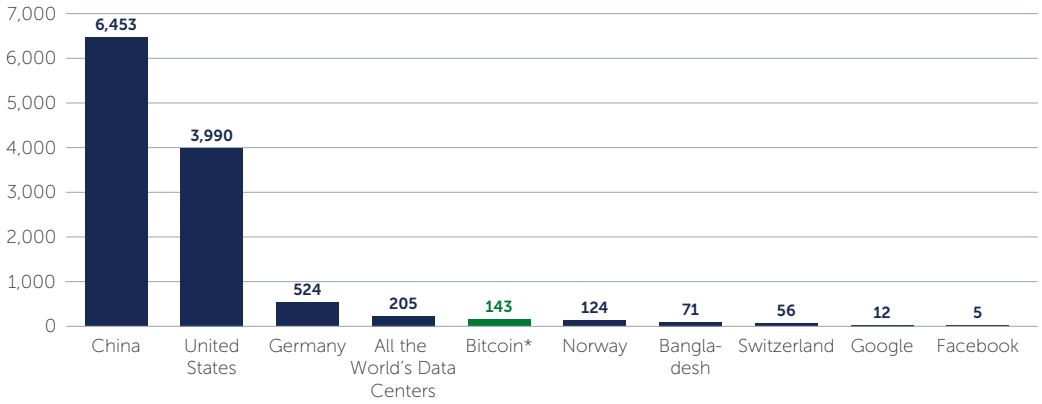
Taking this simple logic and applying it to business processes, which are often standardized and repetitive, has the potential to dramatically reduce the costs of verifying and processing transactions. Potential use cases for such technology span virtually every industry, and may well prove to be where most of the economic opportunity lies for investors, as opposed to the highly speculative frenzy in the markets for so-called 'alt coins' that dominate headlines today. Examples include reducing the operational costs of providing insurance through automatic pay-outs over a blockchain when auto claims are made and verified with data from a dash-cam; speeding up the processing of trade finance contracts for shipping of goods on regular trade routes, and so on[7].

4. Blockchains can also be used where a central authority, such as a Stock Exchange, insists all parties are known and that the ledger is available to all parties. Building security into the blockchain this way can mean much faster processing and easier resolution of disputes.
5. Source: Ethereum.org
6. Source: Ethereum.org
7. More examples of smart contracts are here: https://blockgeeks.com/guides/smart-contracts/

The Bumpy Road to Mass Adoption

New technology adoption rarely proceeds without speed bumps. Elon Musk had been a loud advocate for Bitcoin, investing $1.5 billion of Tesla's funds into the cryptocurrency in February 2021. However, in May 2021 he tweeted that Tesla would no longer accept Bitcoins as payments for their cars until Bitcoin found a way to become more environmentally friendly.

FIGURE 2: Bitcoin's Electricity Consumption



SOURCE: Cambridge Centre for Alternative Finance, Visual Capitalist. Country values as of 2019.
*Bitcoin figure as of May 5, 2021.

The energy usage is a function of the process for validating trades, also known as "mining", which in this case takes the form of a "Proof of Work" involving solving a mathematical algorithm using servers. Therefore, as transaction volumes rise and the computing power required to mine increases, the energy consumption rises too.

In recent weeks, countries such as China[8] and Turkey have added restrictions to mining and trading cryptocurrencies. Those countries suffering devaluing currencies have an incentive to prevent trading in cryptocurrencies in order to prevent further selling of their currency through such anonymous conduits.

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8. China's incentives to clamp down on Bitcoin also relate to the energy intensity of mining. Miners are incentivized to use the cheapest power they can source, such as coal-fired generation—which has obvious costs to the environment.

The Ethereum blockchain suffers from the same energy costs, albeit on a much smaller scale today[9]. Hence, the developers behind Ethereum are working on "forking" the blockchain underpinning the currency to a version that requires Proof of Stake[10]—a cryptographic method of verification that is orders of magnitude less energy-intensive than Proof of Work—as well as creating numerous "shards" that can run in parallel. These changes should dramatically improve the capacity and speed of the Ethereum blockchain, while lowering the electricity and transaction costs inherent in transacting Ether coins today. Such changes look likely to give Ethereum greater flexibility than Bitcoin to evolve with the needs of business models and applications looking to build on a blockchain.

We are already seeing early business models gain popularity and acceptance:

- Completely new markets for digital goods, such as digital art sold using Non-Fungible Tokens (NFTs) that are recorded on blockchains. NFTs offer the promise to content creators or image rights holders of perpetual royalty streams where before there may have been no way to enforce copyright protections.
- Digital Autonomous Organizations (DAOs) selling digital tokens as a way of crowd-funding new products, where the value offered to the investor is whatever right or good is attached to the token. Such companies arguably have access to much more financial liquidity from outside of the traditional banking or venture capital systems than would otherwise be the case. The management structures are flat with decision making decentralized and fully transparent, in contrast to traditional companies with boards of directors centralizing and providing limited transparency on their activities to outside parties.

A final point to make is that we see the market prices for some cryptocurrencies as somewhat of a distraction. In our opinion, the real opportunity here is the growth in new types of applications that lower the costs of digital activity and help the creation of new markets. In any case, the barriers to entry for new cryptocurrencies with superior attributes to Bitcoin and its peers seem very low, in our view, which means that more competition for capital is inevitable.

Where Does This Leave Internet 2.0?

The kneejerk reaction of some industry analysts to the emergence of Internet 3.0 and the promise of disruption is to argue that the leading 2.0 companies, notably Facebook, Google and Amazon, will be the victims as Internet 3.0 usurps the old way of monetizing online activity.

We would note that while Internet 2.0 changed how end users made use of websites to find information, create their own content and to purchase online, Internet 3.0 is much more about the back-end of the internet and how it can be made more efficient. Where consumers do their research or buy their goods is unlikely to change too much, but the infrastructure that facilitates how they interact with online services will change, and become more automated and lower cost. In this world, the sheer size of the user bases and the economies of scale driving their low unit costs of their infrastructure remain critical foundations for sustaining the competitive advantage of the Internet 2.0 companies. The fact that the digital advertising market has only just reached 50% of the global advertising market[11], and also that e-commerce has still only penetrated 18% of the worldwide retail market[12], underpins our confidence that these companies still have plenty of growth potential to enjoy for some time to come.

9. Source: Statista. As of May 6, 2021.
10. Essentially the parties looking to verify any trades to be added to the blockchain stake an amount of Ether coins that they will forfeit if they make errors, go offline or fail to validate trades. Source: Ethereum.org.
11. Source: Marketingcharts.com. As of February 17, 2021.
12. Source: eMarketer. As of January 14, 2021.

Conclusion

The early developments in designing the digital infrastructure upon which new kinds of distributed applications and businesses can be built have caught the imagination of entrepreneurs and are already starting to enter the mainstream. Ethereum is a prominent example, but it is certainly not the only community or organization pursuing this opportunity.

The opportunity for blockchain-based business models is to take advantage of lower costs of finance and more efficient operational solutions to their day-to-day transactions with customers and suppliers. Smart Contracts offer a near limitless range of possibilities over the next decade, but will start as simple applications and address specific use cases not well served by expensive lawyers or traditional financial institutions such as banks.

While Internet 3.0 promises significant disruption, it seems to us more of an evolution of Internet 2.0. New and very large digital markets will emerge and grow the available pie for all parties. Physical scale and large user bases remain critical features of sustained competitive advantage and profitable growth, so anyone writing off the winners of the Internet 2.0 era should be wary.

The world is on the cusp of a wave of innovation that may well reshape the digital economy, but also accelerate its growth. Blockchains are inherently simple approaches to solving the barriers to economic activity caused by the need for central authorities that control who can take part in a marketplace, and how much "trust" is required to make the marketplace function properly. As such, Internet 3.0 offers much promise for the future evolution of the internet to one that is even more inclusive and productive.

For investors, some of whom are still early in embracing the role of technology as a disruptive force across all industries, this means another chapter of heightened change. There will be exciting winners emerging from the pack of the new businesses and technologies we see today. At the same time, assessing which of today's champions are best placed to drive continued and sustainable growth and returns, and which may be vulnerable to this new wave of competition, remains key. As such, we continue to believe that the key to benefit from investing in technology requires a very active bottom-up approach.

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**As of March 31, 2021*

21-1670457