



17th March 2021 Digital Bytes

[GovTech - Blockchain technology driving change in the public sector](#) - typically a government employs 16% or more its country's work force. The challenge is that many have suffered on-going cutbacks in their budgets so often lack the funds to engage in the growing GovTech solutions which are available to help make them more efficient and transparent.

[NFTs, creating a new Pandora's box for collectors or will they prove to be a litigator's pot of gold?](#) - There are millions of people posting IP on social media sites such as Instagram, Tick Tok etc, but how do these people protect their IP and not miss out on being the next Beeple (who sold his NFT for \$69 million)? As NFTs become a new asset class, the nuances and challenges of IP are surely to be examined and tested by lawyers, given the growth and attention that NFTs are commanding.

[Institutional interest in digital assets keeps growing](#) - Almost every week there is an announcement of another major financial institution offering digital asset services or confirmation of its client's interest or its engagement with this new asset class. Clearly the recent rise in crypto prices continues to attract headlines, however, the establishment of institutional infrastructure - such as crypto custody- demonstrates the longer-term aspirations of institutions wishing to be involved with this asset class.

[DeFi, Fast and Furious Finance](#) - DeFi prices have been rising as investors are increasingly trading these unregulated digital assets. There is a need for greater education and analysis to both assist buyers and allow DeFi to realise its true potential whereby offering a challenge to existing financial services, such as lending, borrowing, etc.

Blockchain

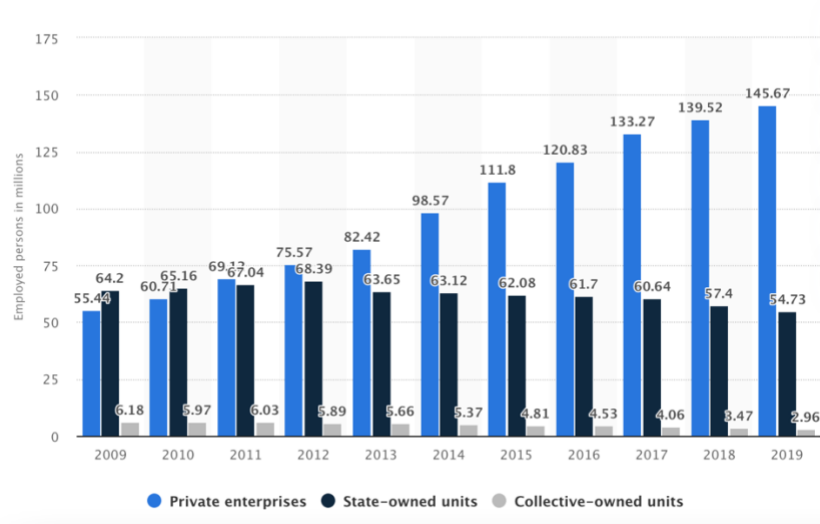
GovTech - Blockchain technology driving change in the public sector

In order to stimulate local and national economies, authorities need to engender greater confidence in the fact that it is, indeed, safe for people to return to their offices, shops, restaurants, entertainment venues and travel (particularly on public transport). We have seen initiatives in cities such as Girona, in Spain, where the Catalan De Blockchain has worked with city officials and technology providers to launch an app which their local [football stadium](#) is looking to use to encourage the safe return of fans. Called 'Obrir Girona',

it is hoped that the Blockchain-powered app will enable the city's local residents to gather at public events by using this 'covid-free' digital passes.

Undoubtedly, public authorities all over the world are vast employees of people. In the UK there are [5.5 million](#) people (16.7% of the work force), in USA [24million](#) (15% of the work force) and in China, back in 1978, it was an incredible 100% of the labour force who were employed by government-run organisations!

Number of people working in Chinese state-owned enterprises



Source: [Statista](#)

In view of this, it ought to be of no surprise that there are a number of Blockchain-based apps that are being used to help improve the efficiency in the manner in which human resource departments are run. Listed below is a selection from different jurisdictions around the world:

- [the BeSure Network](#) - when working in dangerous/hazardous environments, information can be securely accessed by managers, employees and regulatory bodies
- [Blockeducate](#) - stores and shares educational qualifications
- [eXo Platform](#) - used by the University of California and HSBC for staff rewards and recognition, since "47% of staff do not feel recognized for what they do"
- [Job.com](#) - uses AI and Blockchain to match job seekers with the right company. Rather than the standard 20% commission, employers pay only 7% of a candidate's annual salary when they sign up on Job.com. Additionally, 5% of this is immediately sent to the candidate as a signing reward
- [Oracle](#) - helps new staff induction processes
- [Peoplewave](#) - assists candidate sourcing, selection and screening
- [TiiQu](#) - offers a Blockchain-powered platform to create a digital passport to be used as proof of a candidate's professional trustworthiness, identity and qualifications
- [Vault Platform](#) - used to make harassment reporting more transparent:

- [Zinc](#) - allows users to upload their skills and experience data, empowering them to decide with whom they share this data, and when. Ensures CVs are always up to date and accessible anywhere in real-time.

Furthermore, [Deloitte](#) believes that Blockchain technology is able to support local authorities and governments in a variety of ways in order to make them more efficient as well as improve the effectiveness of the services which they deliver. For example:

- as an official registry for government-owned assets or intellectual property owned by businesses and individuals i.e., offices, homes, vehicles, patents
- to help with the way voting and elections are conducted
- to streamline tendering of goods and services
- to reduce fraud and error by bringing greater transparency and automation of current labour-intensive processes

Unsurprisingly, there are many challenges government bodies face as often they are run in a very bureaucratic fashion and lack the funds to implement change. Often their procurement processes make it extremely difficult for new tech disruptors to even tender. Another factor holding back innovation is education, i.e., those working in government-run organisations often lack the time to undertake the research required to find the so-needed solutions due to cutbacks. In the UK, organisations such as [CPRAS](#) are actively engaged with government bodies to help drive through change and bring about more efficient practices. When recently asked, Richard Hallewell at CPRAS responded: *“Procurement and education challenges go hand-in-hand and, together, are applying a handbrake to the adoption of tech solutions in the public sector. We need to bridge this gap urgently or we will be condemning our public sector to a default position of high-cost / low-impact cycles. The alternative though is transformational – imagine if we can arm all our public services with the most efficient and impactful solutions available. Together with the [CIPFA technology Procurement Association](#) we are building the knowledge base and procurement pathways to release the hand-brake to create a “new norm” where Councils and the wider public sector can benefit from the transformative solutions that are being developed all around the world.”*

As a result of there being considerable press surrounding FinTech, RegTech, LawTech and PropTech, it comes as no surprise to see more are more focus on GovTech.

Digital Assets

NFTs - creating a new Pandora’s box for collectors or will they prove to be a litigator’s pot of gold?

As the world increasingly transitions from the constraints of national borders, and therefore becomes potentially less reliant on specific national legislation and regulations, this presents a real challenge for creators’ intellectual property (IP) as we continue to see the evolution of promoting their creative talents. Given the global reach of the internet and the ability to post and stream content on social media sites (such as Instagram and TickTok), there is a real challenge as to how to protect the creator’s IP.

The rewards for posting and having a 'following' on TickTock are highly appealing, especially for younger viewers who no doubt aspire to be able to repeat the success of some of TickTock's highest earners, such as the 19-year-old Addison Rea (who is alleged to have earned [\\$5million in a year](#)). Instagram, too, offers riches to those who have millions of followers; the American actor, Dwayne Johnson, is reported to be being paid over [\\$1million per post](#). However, to attract sufficient followers you need to post content, and there lies the problem. How do you protect your IP i.e., your pictures, videos, songs, etc from being copied and used by others? There have been a number of cases where a [brand has actually used images](#) from someone's social media post without paying for the images. But unless you have registered your IP, how do you protect it?

The challenge of IP and being able to prove provenance is likely to become an increasing challenge for the new asset class which is grabbing headlines and attention - Non-Fungible Tokens (NFTs). Christies auction house in London recently sold an NFT of a picture from an artist, Mike Winkelman (otherwise known as Beeple), whose digital art 'The first 5,000 Days' had bidding begin at \$1,000, eventually selling for \$69 million and which [The New York Times](#) reported as "*a JPG file was bought using a cryptocurrency*". In doing so it made Beeple the [third most expensive living artist](#) to sell work at an auction! As you can see from this [YouTube clip, Beeple](#) was completely amazed, too!

In simple terms, an NFT can be described as a digital file typically stored on a Blockchain, being created by uploading the file. This could be digital art, such as Beeple's, or music such as the Kings of Leon have recently done generating [\\$2million from their NFT](#) sale of an album, or even a video clip such as the basketball player LeBron NFT which sold for [\\$200,000](#) on an NFT auction site. NFT auction sites such as [Foundation](#), [Nifty Gateway](#) and [SuperRare](#) are enabling artists and creators of IP to 'cut out' the middlemen, agents, brokers, managers etc and simply upload their work (all at the click of a mouse) and watch the bidding commence.

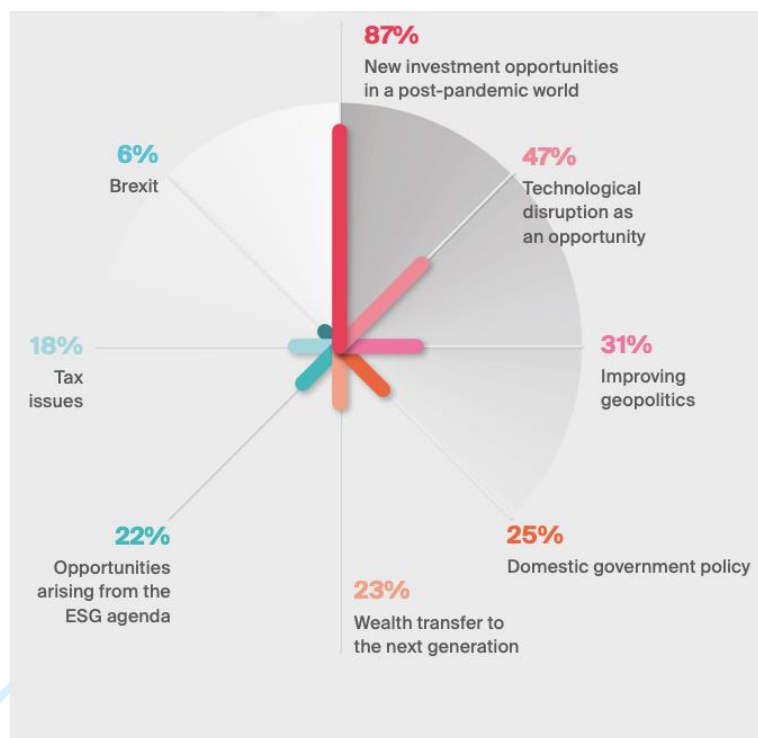
So, what is the solution? How do wannabe NFT sellers protect their creations in order to prove they wrote the script, the song, took the photo/video etc? Well, look to [Andy Rosen](#), a Brit living in Los Angeles who has been dealing with artists since the late 1970's when he was a 'snapper' (photographer) for iconic bands such as The Jam, the Sex Pistols, Boy George, Bruce Springsteen. Rosen has built [FileProtected](#), a Blockchain-powered platform to enable people to register their own creative works and so generate an immutable record of their IP. Furthermore, Rosen has had considerable personal experience seeing artists losing control over their IP which is what inspired him to build FileProtected. Whilst it was not developed specifically for NFTs, FileProtected could well prove to be a great tool for this rapidly growing market.

Certainly NFTs are attracting attention worldwide as [Martin Bartlam](#), who is International Group Head of Finance & Projects and FinTech Global Co-chair at the global lawyers DLA Piper has stated: "*NFTs are becoming increasingly popular as a means of digitally recognising an identifiable interest in a specific asset or even just a specific part of an asset. This enables value to be realised by turning ownership interests in traditional assets into a digital tradable form. Ownership is digitised and parcelled into unique electronic units that*

can be transferred with ease across countries and networks. Ownership might relate to a photograph, a song or even a memory as well as property or other traditional assets. **This is our modern version of opening up new trading routes.** Whilst care needs to be taken, as with any purchase, it certainly opens a digital doorway to a new and potentially exciting global marketplace". If this proves to be the case, it will be more evidence of how Blockchain technology is creating a new asset class and potentially driving a more decentralised way of trading assets.

Furthermore, NFTs (which, in effect, are digital collectables) could prove to be increasingly popular for high-net-worth investors as, according to the 2021 wealth report from Knight Frank, these wealthy potential investors are looking for new opportunities.

The opportunities most likely to excite wealthy investors in 2021



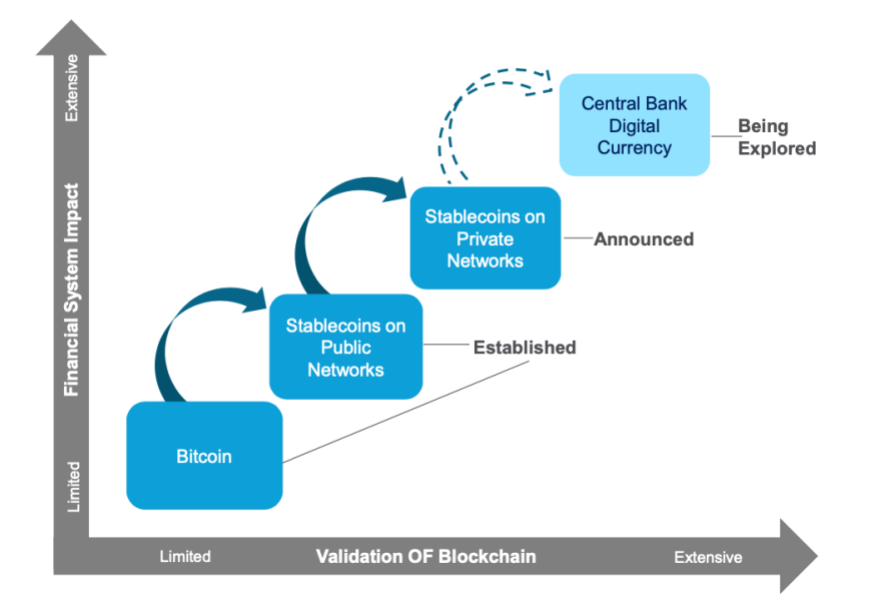
Source: [Knight Frank 2021 Wealth report](#)

This new asset class will no doubt bring its share of challenges in terms of the legal issues with regards to ownership and, indeed, the ability to sell the IP, as well to prove that transfer and actual ownership has occurred on the sale of an NFT. Hence, could NTFs prove to be a pot of gold and source of bountiful litigation fees for lawyers as they are asked to challenge or defend buyers and sellers over an NFT's authenticity, provenance and value etc? Will Blockchain-powered platforms and the ledgers they create fall short when faced with the rigours of a thorough forensic investigation and legal debate in court? For this we will have to wait and see, but for now maybe you need to spark up your creative juices and see what IP you might have in a dusty box under your bed or hidden in your attic and, who knows, you may well have the potential to create and sell your own NTF and be tomorrow's headline at a Christies or Sotheby auction?

Institutional interest in digital assets keeps growing

There has been a flurry of institutions making announcements as to their involvement with digital assets and crypto currencies. Goldman Sachs surveyed over 300 of its high-net-wealth clients and found that over [40%](#) of them are already exposed to crypto currencies in various ways, with 61% intending to increase their exposure to this asset class in one way or another. However, it is not only Goldman Sachs which has turned its attention to digital assets. As reported by Reuters, Citibank believes: "[Bitcoin is at a tipping point and could become the preferred currency for international trade.](#)". Citigroup believes that we may well see a rise in the number of stablecoins run on private permissioned Blockchains in the future.

Innovations on Blockchain broaden cryptocurrency impact on financial systems



Source: [Citi Business Advisory services](#)

Citi notes how Bitcoin has paved the way for stablecoins a [\\$55 billion](#) asset class run on public Blockchains i.e. Tether, USDT and it can see the potential for the rise of stablecoins on permissioned Blockchains, similar to what Facebook is proposing with Libra (now renamed Diem). As Citi explains in its report: "*Unlike traditional payment systems, Diem is designed to minimize fees and eliminate them as a business model for network operators. While it has not been explicitly announced, there is a significant likelihood the companies which are part of the Diem Foundation will incentivise users of their services to pay for them in Diem as opposed to in fiat currency. Such a move might enable companies to recoup the fees that they pay out to traditional payment networks. Removing some of the frictions associated with traditional payment networks is another impetus to explore private network stablecoins. To that end, JPMorgan has created a unit called Onyx within their wholesale banking division to experiment with blockchain-related solutions and designed its own 'JPM Coin' to improve the movement of money within its balance sheet, such as for cross-border payments or securities settlement*".

Therefore, it is not difficult to see why central banks need to respond and not become left behind in launching their own Central bank Digital Currencies (CBDC) or otherwise face losing control over money in their economies.

A website, bitcointreasuries.org, which tracks bitcoin holdings by different organisations claims that 25-publicly-quoted companies, hold over \$10 billion of bitcoin. The largest holder of bitcoin for a quoted company is MicroStrategy, which Forbes claims to now be valued at [\\$4.45 billion](#). Meanwhile, PayPal and Square (two payment platforms) have both seen their clients' exposure to Bitcoin rise. Meanwhile in Europe, [Standard Chartered and Northern Trust](#) announced in December 2020 that they had applied to the UK FCA for permission to launch an institutional custody service firm (Zodia Custody) to offer a more secure way in which to hold cryptos for their clients. Also in Europe, [Donner & Reuschel](#), a German private bank was established in 1798, and which currently holds \$10.7 billion of funds undermanagement, has announced its plans to [offer cryptocurrency services](#), whereby introducing its clients to cryptocurrency trading and custody facilities. Marcus Vitt, speaking on behalf of the bank (which is also planning to offer [asset tokenisation services](#)) believes that *"Blockchain technology will result in the greatest structural change in the financial industry that I have been able to experience so far in my 20-year banking career."* Also in Europe the Dutch with their [2Tokens initiative](#) have been very active and we will be getting an update in the next couple of weeks on their projects which include how Blockchain technology is being used to track and trace renewable energy, invoice financing and the digitisation of share registers.

In the intervening time, many traditional financial services firms are now looking to offer custody services for crypto assets as well a host of new FinTechs firms also offering custody solutions. The publication, [Nomics.com](#), 20 firms active in the providing custody of digital assets so, the position from merely a couple of years ago where searching for a company able to provide crypto custody was akin to looking for a 'hen's tooth' to now, where there is a cornucopia of firms prepared to provide cryptocurrency custody. This expansion of custody is not only vital for institutions which require such services is, in effect, creating a new infrastructure for financial markets. These new custody providers ought to mean one less barrier needs to be tackled to enable the adoption of other digital assets such as CBDC, NFTs and other DeFi tokens - all of which are increasingly attracting greater attention from asset managers and, indeed, governments.

Guest Byte

DeFi - Fast and Furious Finance

Written by [Dr Jane Thomason](#) - author of [Blockchain Changing the world](#)

2020 was marked by a Decentralised Finance (DeFi) boom, the total value locked in DeFi contracts surged 40x to \$83 billion at the end of December 2020, from \$600 million in January 2020 and continued to rise as shown in the Figure below.

Market capitalization of DeFi coins - March 2021



DeFi brings a new paradigm to financial services and encompasses:

- Issuance: Stable Tokens, Debt, Securities, Insurances NFTs,
 - Trading: Decentralised Exchanges, Derivatives, SWAPs, Prediction Markets; and Liquidity Relays
 - Ownership: Wallets; Baskets and Fund Management; and Payment Networks.
- Automation is the game changer as Blockchains enables the creation of 'smart contracts' that can self-execute once certain criteria have been met, eliminating the need for middlemen. The Figures below show the DeFi Top 50 and Market Capitalization of Top 10 DeFi coins as of March 8, 2021.

Market capitalisation of top 10 DeFi coins – 16th March 2021

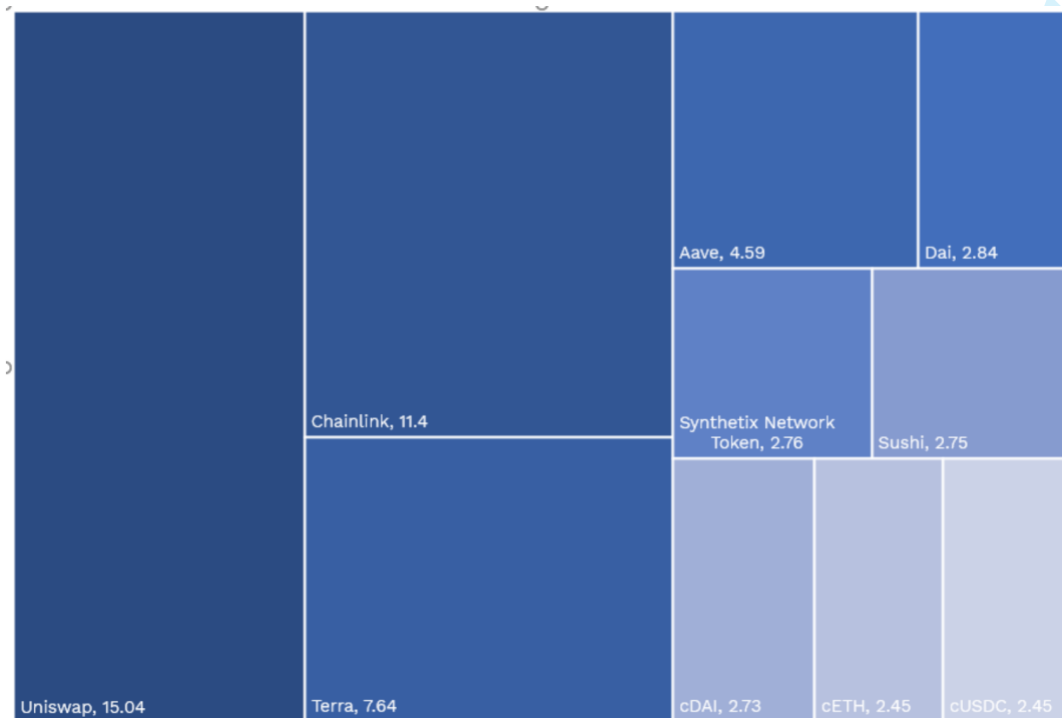
Coin	Market Cap (in \$bn)
Uniswap	15.1
Chainlink	11.4
Terra	7.8
Aave	4.5
Dai	2.8
Synthetix Network Token	2.7
cDai	2.7
Sushi	2.7
cETH	2.6
cUSDC	2.5

Source: [Coingecko](#)

Decentralised exchanges (DEXs) users trade directly from their wallets in a P2P manner without intermediaries that custody funds and place robust personal information checks.

However, DEXs that use the traditional order book method face the issue of front running. The order data on DEXs are recorded on a blockchain, thus miners can see all the transactions that could affect the prices of tokens and can act on the information and place their own orders and include them in the block. The order book approach is also susceptible to spoofing. An abusive trader can place large buy or sell orders to mislead the market sentiment and cancel the orders, creating high slippage for other traders. Liquidity aggregators came to rise to bring liquidity into one place and reduce slippage.

Decentralised Exchanges



Source: Coingecko

Automated Market Makers (AMM)

Much of the DeFi excitement has been driven by the impressive returns for providing liquidity. A liquidity pool is created and funded by liquidity providers (LPs) for both tokens of a trading pair. Uniswap, leading the Ethereum-based DEXs with 49.4% market share, uses a constant product market maker model. Here, anyone can become an LP by posting any ERC20 token and an equivalent value of ETH to a pool.

AMMs face a significant risk of impermanent loss. As the prices of the tokens held in a pool are determined by an algorithm that adjusts the ratios of the tokens in the pool, if the ratio between the two tokens changes drastically after depositing them in the pool, there will be a high slippage. Some projects have come up with solutions to impermanent loss. To avoid price volatility, liquidity providers can stake in stablecoin pools in Curve. AMMs have dramatically decreased time to market. It is now possible to create an idea on the Ethereum blockchain and virtually test it overnight. This provides a 'super scaling' vector. The AMM model is still in its infancy and there are more innovative AMM models to come.

Yield Farming

As the distribution of Compound governance token (COMP) boosted the popularity of yield farming, AMMs like Uniswap, Sushiswap and Kyber followed suit, fuelling the interest around yield farming. Yield farmers lock their funds into lending protocols or supplies funds into liquidity pools to earn fees as a passive income. Besides the fees, LPs are provided with new tokens, so they are further encouraged to keep funding the liquidity pools. Say a farmer stakes 1,000 DAI in Compound, the farmer gets cDAI in return, which can then be pumped into a liquidity pool that accepts cDAI and earns transaction fees. Making more crypto with crypto.

Despite the eye-opening 200%, 300% APYs which pulled investors to yield farming, it is dangerous to jump into this new wave of trading without the ability to adjust strategies according to market movements. Risks include liquidation risk, technical risk and price risk. The price of the token you put as a collateral to take out a loan could drop below the price of the loan. Smart contracts could be attacked. Lending protocol bZx was attacked three times in 2020, and yield aggregators including Pickle Finance, Harvest Finance, Value DeFi and dForce lost tens of millions of dollars due to flash loan attacks. An attacker could lend funds on a DeFi platform and borrow back, creating artificial demands and manipulating the token prices. Yield farmers could also make meaningless transactions on DeFi protocols just to interact with the protocol in order to earn token rewards (apart from fees and interests) in hope of price appreciation. However, in crypto, token prices could fall drastically overnight. YAM tokens dropped over 90% in a few minutes. It is expected to see a fast growth of hedging strategy providers. DeFi insurance Nexus Mutual's active cover amount sits at \$136.5M and the most demanded protocols to be covered are Curve, RenVM, and Aave V1, according to [Nexus Mutual Tracker](#). Yield farming has succeeded to draw attention and capital to DeFi. As the space continues to evolve, more fresh ideas and innovative financial products are expected.

Ethereum Killers

DeFi, mostly built on Ethereum, has gained massive traction. However, as the Ethereum ecosystem expands and DeFi gains popularity, so-called 'Ethereum Killer' blockchains are emerging. Below we map out the DeFi ecosystem of Ethereum, Polkadot and Cosmos.

DeFi ecosystem of Ethereum, Polkadot and Cosmos

DEFI ECOSYSTEM			
	ethereum	Polkadot	COSMOS
AUTOMATED MARKET MAKING	Bancor, UNISWAP, kyber network, Balancer	Polkaswap, Polkastarter, mangata	THORCHAIN, zilswap
DEXes	DDDEX, GNOSIS, LOOPRING, IDEX	IDEX	BINANCE DEX, OKExChain, CoinEx Chain, SWIPEO
LENDING	Compound, 5Y/5X, AAVE, MAKER	AKROPOLIS, MANTRA DAO	Kava, ANCHOR, CENTAUR, HARD PROTOCOL
DERIVATIVES	SYNTHETIX, 5Y/5X, opyn	Laminar	Mirror, VEGA, INJECTIVE PROTOCOL
DEX AGGREGATOR	0x, Matcha	Reef, ZenLink	
CROSS-CHAIN PROTOCOL	Ren VM	ZenLink, HYDRA, mangata	KIRA Network

Source: Novum

Challenges of a Decentralised and Unregulated Space

This is a new and unregulated space. Regulators protect consumers and investors, however, in DeFi you don't have any intermediaries to regulate, as it's totally P2P. Many of the developers creating the trading algorithms do not have the years of experience that traditional quant fund developers have and, when unexpected volatility occurs, they may not know how to deal with them and risk crashing the fund. Julien Bouteloup, from [Stake Capital](#) said, *"What I'm seeing in DeFi is the Lego concept, where people are building different tools that can be easily plugged-in plug and play without really understanding how to build them. You can be a non-developer, but you can actually go to GitHub, and then plug and play a system that will do a flash loan"*.

How do you stop consumers and investors getting hurt when activities are not controlled, moderated, intermediated, hosted or validated by a single or centralized party, other than the smart contract? DeFi relies on a decentralised governance mechanism, such as a Decentralised Autonomous Organisation (DAO), but individual project governance can be opaque. DeFi platforms rely on open-source computer code, and some pay security researchers to conduct audits of the code to see if there are any vulnerabilities. Unaudited projects are riskier than audited, but just because a project has been audited it does not mean that it is safe. If the smart contract malfunctions, is hacked or otherwise has a problem, there is no recourse. DeFi products and services are available to a global audience which means it's hard to undertake meaningful due diligence. As Arthur Stolk of [Icoinic](#) points out, *"It's a 24/7 market. It never closes and that's something new"*. *How should regulators think about activities that cross borders seamlessly and operate on a 24/7 basis?"*

Questions remain about definitions, developer liability, legal status of code, application of AML/KYC and jurisdiction. How is governance assured, and what are the mechanisms for change? To respond to this, a number of firms have established themselves recently to help DeFi investors. [Messari](#) provides crypto market with professional grade data, tools, and research; [Dune Analytics](#) provides Ethereum analytics; [Crypto Compare](#), a well-established firm in the digital asset space, provides definitive, real-time digital asset data; [NYCtale](#) provides business Intelligence solutions to monitor dApps performances and [Novum Insights](#) provides actionable analysis on all the major DeFi trends, and has launched a series of products targeting the decentralised finance sector. Finally, the [DeFi Score](#) is a community-contributed single, comparable value for measuring platform risk, based on factors including smart contract, centralisation and financial risk.

As Lee Schneider of [Global Blockchain Convergence](#) points out, DeFi does not exclusively involve financial instruments, so DeFi platforms permit the mingling of asset types in ways never before achieved. The question is how will DeFi be regulated in the future?

Digital Bytes show on Blockchain Radio

Each week on the Digital Bytes show Pierre Bourque, CEO of [Blockchain Radio](#) in Ottawa, Canada, talks to Jonny Fry from TeamBlockchain reviewing the latest Digital Bytes. They explore how, where and why Blockchain technology and/or Digital Assets are being used in various industries and jurisdictions globally.

Blockchain Radio is streamed/listed on 10+ different platforms/websites, with listeners in over 140 countries with predominance in Western Europe, North America, and India. The interest and thirst for information and knowledge about Blockchain and Digital Assets is clearly demonstrated since Blockchain Radio has over 100,000 listeners per month with an average of 24 minutes listening-time per listener. This week on the Digital Bytes show we talk to Anthony Lyall about the first real use cases of Bitcoin and blockchain, along with the present state of crypto as an asset class and some of the useful current examples of blockchain. We also discuss NFTs, Proof-of-stake v. proof-of-work, Libra-now-Diem and the true underlying value of Bitcoin and where it goes from here.

To listen to the latest Digital Bytes show on Blockchain Radio, click [here](#).

If you have comments about any of the content in Digital Bytes or there are topics you would like to be covered, or if, for some reason any of the above links do not work, please contact me at:

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