

Evidence Report
APPG BLOCKCHAIN
UK Parliament



ALL-PARTY
Parliamentary
Group on
Blockchain

DIGITAL ASSETS AND TOKENISATION

Blockchain applications - regulation, policy & strategy



2020 NOVEMBER



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1. APPG Blockchain Evidence Meeting on Data Governance & Regulatory Framework.

1.1. Purpose

The purpose of the All-Party Parliamentary Group on Blockchain (APPG Blockchain) is to ensure that industry and society benefit from the full potential of blockchain and other distributed ledger technologies (DLT) making the UK a leader in Blockchain/DLT's innovation and implementation.

This Report of the 16th Evidence Meeting explores the use of Blockchain-Based Digital Assets and Tokenisation. The report provides a summary of the takeaways from the meeting. The Video recording of the session is available on our websites APPG Blockchain www.appg-blockchain.org/ and Big Innovation Centre www.biginnovationcentre.com/

1.2. Details of the Meeting

- Date, 20th October 2020
- Time, 17:30 – 18:30pm BST
- Location, Virtual House of Commons
- Participants, 107 attendees



1.3. Panellists: Evidence Givers, Chair & Secretariat

The evidence meeting was Chaired by the APPG Blockchain Chair Martin Docherty-Hughes Member of Parliament. Vice-chair, Lord Waverley has submitted his apologies for absence.

Big Innovation Centre acted as the Secretariat for the APPG on Blockchain, led by CEO, Professor Birgitte Andersen and Fernando Santiago-Cajaraville as the Project Manager and Rapporteur.

Building a robust Blockchain ecosystem is part of the APPG Blockchain mission. Assuring representations from across stakeholders, The APPG meeting on digital assets had representatives from,

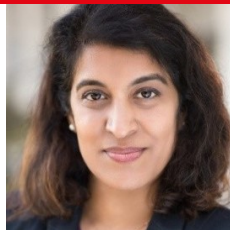
- Academia – Massachusetts Institute of Technology (MIT)
- Blockchain Industry – Dapper Labs & Looking Glass Labs
- Global Institutions, World Economic Forum
- Industry Associations, Adan (Association for the Development of Crypto-Assets)

Evidence givers



Faustine Fleuret
Head of Strategy and Institutional Relations

Adan (Association for the Development of Crypto-Assets)



Sheila Warren
Head of Blockchain, Data, and Digital Assets

World Economic Forum



Neha Narula
Director of the Digital Currency Initiative

MIT Media Lab



Teana Baker-Taylor
Director

Looking Glass Labs



Roham Gharegozlou
CEO & Kitty Business

Dapper Labs, CryptoKitties

Chair



Martin Docherty-Hughes MP
House of Commons, UK Parliament

Secretariat



Secretariat:
Professor Birgitte Andersen
CEO

BIG INNOVATION CENTRE



Rapporteur
Fernando Santiago-Cajaraville
Project Manager,

BIG INNOVATION CENTRE

2. Background



The sixteenth APPG on Blockchain evidence meeting on Tokenisation and Digital assets aimed to explore the current uses, risks, and benefits of Blockchain-based digital assets. The guiding questions provided to the Evidence givers were

- What is asset tokenisation?
- Can a tokenised economy become a reality?
- What will the financial institutions need to consider to be part of the token economy?

Tokenisation

Tokenisation can be defined as the "digitised way of holding an asset wrapped in a programmable layer" (*N. Narula, MIT*) or the "process of converting ownership rights, and an asset into a digital token held on a blockchain or a DLT" (*S. Warren, WEF*).

In an analogue with the IT systems, Blockchain is a new kind of computer that can run new software applications (smart contracts) where the tokens would be the essentials files that the applications need to do the job. (*R. Gharegozlou, Dapper Labs*)

In order to get a full development of the Blockchain technolog the regulation that underpinned the technology need to be develop, as currently crypto-assets, are assets that do not qualify under existing regulations (*F. Fleuret, Adan*)

A Tokenised Economy - Benefits

"Tokenisation has the potential to function as a **digital public good**, a piece of digital commons" (*R. Gharegozlou, Dapper Labs*), bringing the **financial inclusion** to a vast majority with no access to high-value investments. (*S. Warren, WEF*). Tokenisation can bring several operational benefits and opportunities to the current systems as,

Operational benefits,

- Upgrade slow, inefficient, and sometimes physical systems. (*N. Narula, MIT*)
- Decreasing barriers and friction, reducing intermediaries, improving liquidity (*S. Warren, WEF*)

Tokenisation also brings in New economic systems and markets. The new economic system means

- An economic system outside of anybody's control. (*R. Gharegozlou, Dapper Labs*)
- A new way of asset management (*S. Warren, WEF*)
- DeFi, decentralise finance, an open finance movement built upon public programmable blockchains (*T. Baker, Looking Glass Labs*)

3. Meeting Takeaways

3.1. Regulation, Regulation & Regulation

The **UK requires specific regulations** for digital assets. Contrarily to other financial centres, the UK has taken a slightly different approach to regulate this new kind of assets. The country focuses on market activities individually than addressing the industry as a whole.

"With Brexit looming and other competitive global financial centres ruling the digital assets, the UK risks being left behind." (T. Baker, Looking Glass Labs)

The current lack of a regulatory framework is potentially a barrier for the development of the crypto industry. At the same time, a panacea for those who want to operate outside of the law. In order to avoid the operators outside the law and catalyse the full development of the Blockchain technology in the area of Digital assets, the Blockchain industry is asking for more regulations to carry on with their innovations.

"The unclear regulation is hamstringing entrepreneurs." (R. Gharegozlou, Dapper Labs)

Self-regulation is probably not an option for Blockchain digital assets. For instance, previous experiences in the early days of internet discourage for the industry "self-regulation". The Internet and Blockchain are both focused on exchange, while internet focuses on information exchange, Blockchain focuses on value exchange.

"We would not certainly advise letting the industry self-regulate." (S. Warren, WEF)

Regulations, where implemented, **have provided strength** and excellent dynamics to the crypto assets industry. The current French regulatory regime has provided an impetus to the development of the ecosystem attracting players from other parts of the world.

“The regulatory regime that was established in France has given a significant momentum to the growth of the crypto ecosystem.” (F. Fleuret, Adan)

“The entrepreneurs in the space need a safe harbour to test our innovations.” (R. Gharegozlou, Dapper Labs)

The **EU Commission has just released its proposal** to regulate crypto assets in European economic zone. This is the first step of a transition to full regulation in 5 years' time. Blockchain technology as cross border technology should aim for global regulation.

“The World Economic Forum thinks that we need a very global and multi-stakeholder approach.” (S. Warren, WEF)

3.2. New economic opportunities. Decentralised Finance (DeFi) & Non-Fungible tokens

The benefits of the tokenisation and Blockchain-based digital assets have the potential to boost a new complete industry, DeFi or Decentralised Finance.

DeFi is an open finance movement built upon public programmable blockchains. It has the potential to disrupt the financial services. In 2020, the value locked in the industry has reached \$11Bn

“It has become clear that digital assets can do much more than replace fiat currencies.” (T. Baker, Looking Glass Labs)

“We have the opportunity to rethink the way money rails work.” (N. Narula, MIT)

However, Blockchain-based digital assets are more than DeFi and fungible assets. The area of digitalisation or digital native, non-fungible assets is something to be in consideration. Non-fungible assets have the potential to be applied to several industries, videogames, the art of insurance.

“Most things in life are non-fungible, the homes we own, the art we own, our data, our friends are those things are non-fungible.” (R. Gharegozlou, Dapper Labs)

3.3. Risk and Resistance

A tokenised economy is not exempted of risk. Apart from the intrinsic risks of the technology, we should be cognizant of the incentives of the participants involved in the technology. We should prevent the space from replicating the same mistakes of the web and the internet. The promise to remove physical intermediaries cannot be replaced again with more powerful digital intermediaries.

"It is important to do due diligence on the incentives of the people and projects to get to the details of what is going on". (N. Narula, MIT)

Crypto-assets and crypto-industry represent a threat for incumbent actors in the financial sector and the area of "correspondent banking" in particular. As a result of this, resistance from institutions is in place in the form of barriers to access to financial instruments (bank accounts) or credit for enterprises working on the crypto-business or marketing bans from GAFA (Google, Apple, Facebook, Amazon).

"Some of the incumbents do have vested interest in the current systems remaining the same". (S. Warren, WEF)

"It is challenging to access to financial or marketing services when you are a crypto blockchain company." (F. Fleuret, Adan)

3.4. Financial Institutions should join the revolution.

With the rise of the Blockchain-based digital assets market and the irruption of Blockchain in the new evolving area as DeFi (decentralised finance), an open finance movement built upon public programmable blockchains, financial institutions need to be part of the "token" economy.

"The promises of tokenisation are starting to come to fruition. The growth and maturation of the digital asset market continue." (T. Baker, Looking Glass Labs).

Central banks are entering to understand the applications, benefits, and risks of Blockchain technology.

"The ethos of "move fast and break things" is not going to work for the global financial system." (N. Narula, MIT)

Financial institutions should focus on adding value to the finance supply chain. They are in front of a huge opportunity to upgrade a lot of very slow and inefficient current systems. In the future, open and accessible platforms will be the standard which will promote competition and choice.

"Financial Institutions will need to focus on adding value, not being middlemen, not being intermediaries."(R. Gharegozlou, Dapper Labs)

4. Evidence Giving

4.1. Faustine Fleuret, Head of Strategy and Institutional Relations Adan (Association for the Development of Crypto-Assets)



Cryptoassets are assets that do not qualify under existing regulations.

The "Blockchain and the Future of the Digital Assets" report for the European Union Blockchain Observatory & Forum was released a few months ago. At the time the report was writing, the European Commission was just starting to think about how to regulate such cryptoassets.

In winter 2020, the EU Commission launched a public consultation on digital assets, on 24th September 2020, the "Digital Financial Package" was released. The package includes two proposals for regulating cryptoassets as a whole. The European Commission considers that cryptoassets are a new asset class.

Cryptoassets and European Regulation

Cryptoassets are assets that do not qualify under existing regulations.

For this type of assets, the European Commission is willing to set a bespoke regime for both, the

issuance, and secondary markets, for those crypto assets.

There also are cryptoassets that qualify as financial instruments, "security tokens". The European Commission has a very innovative way to set the framework for such security tokens.

The EU Commission wants to want to create what they called "pilot regime".

"Pilot regime" is a transitional regime towards a definitive framework for security token markets.

In this "pilot regime", actors would be allowed to benefit from exemptions to the financial regulations, as security tokens are financial instruments they must comply with the financial regulation. This experimentation is supposed to last at least five years.

This is an excellent starting point for the regulation of Crypto assets in Europe. It provides legal clarity and certainty to actors that previously could not benefit from that. Before this proposal, there was nothing about Crypto assets. This move is very positive.

Challenges

However, Adan has identified some challenges that should be addressed in the coming negotiations about this EU Commission framework.

First of all, there are **many bridges for incumbent actors**, like banks or investment firms, **to access the crypto market**. It is easy for them because they have exemptions and could benefit from some equivalences within their services to access the cryptoasset markets.

We can perceive some unequal opportunities for newcomers to access the crypto markets.

In those regulations, there is some lack of proportionality, regarding the criteria to fall in the scope of the EU regulation and "prudential requirements" which can be burdensome for new actors as they must financially participate to this supervision

In the European Commission's text, we have identified some rules that will not be applicable by decentralised use-cases. This could put a break for the development of innovative projects like decentralised finance (DeFi).

This document marks the very beginning of the building of the European framework for cryptoassets.

French Regulation

France already has its own regulatory framework for actors in non-financial cryptoassets. As the European Commission does, the French regulation created a bespoke regime for such assets.

The regulatory regime that was established in France has given a significant momentum to the growth of the crypto ecosystem.

Today, we can see that we have many strengths, we have a well-established and ambitious French crypto industry that is structured around the ADAN. The association promotes a very close dialogue with the public sector.

This regulatory framework has attracted the interests of non-French players. It gave a new impetus to the development of this ecosystem, catalysing growing democratisation of cryptoassets. Cryptoassets have started to be seen as credible diversification assets, getting the interest of individuals, and starting to integrate some portfolios.

The French regulatory framework has provided a great dynamic to the crypto industry. A similar impact can be expected from the EU framework proposal on the European ecosystem.

Barriers for the cryptoassets industry

The EU and French regulatory frameworks are an excellent first step but they cannot resolve on their own all barriers to the development of the cryptoassets ecosystem.

For example, in France, we still suffer from a lack of competitiveness and attractiveness; the regulation must resolve that, but not only.

For instance, finding funding is very hard for crypto business.

It is a hard battle for actors in both private sources like private equity and also from public sources. Complicated relations persist between banks and the cryptoassets ecosystem, difficulties take the form of the systematic refusals to open a business account to these new actors.

A recent survey carried out by ADAN shows that about a 68% of participants experimented the refusal to be provided with a simple bank account for their businesses, they are often also refused to be provided with payment services or credit from financial institutions.

In the customer side, there are many obstacles placed in the way of clients wishing to use crypto blockchain services. This is a bias that is quite detrimental to develop the ecosystem.

Out of the financial institutions, many marketing promotions channels are closed to crypto players like the ads services of the GAFA (Google, Apple, Facebook, Amazon).

It is challenging to access to financial or marketing services when you are a crypto blockchain company.

Taxation must be better explored on crypto assets.

There is a terrible image that certain authorities and institutions have regarding the crypto markets because of some preconceived ideas. It has been tough to change it.

Recommendations

In conclusion, regulation is essential to promote the growth of the cryptoassets' ecosystem; but no only.

Authorities and public services must better understand cryptoassets and how they work, their regulatory deadlocks and why, the right level of risks raised by cryptoassets and the opportunities for public actors and users, both in terms of investor protection and efficiency of markets.

Public sector should pay attention to some anti-competitive behaviours from credit institutions and non-financial institutions—for example, the GAFA (Google, Apple, Facebook, Amazon) regarding the ads services.

The UK should ensure level playing field with the EU regulation. At least to not create a harsher regulation than the European Union is building.

Everyone should promote the cryptoassets use-cases that prove significant market opportunities and create a more peaceful environment for crypto assets. The public sector should listen to the cryptoasset ecosystem.

Not to prevent innovation from developing the Cryptoassets in Europe or the UK, means more than a regulation.

The risk exists that innovation runs away to other economic areas.

4.2. Sheila Warren, Head of Blockchain, Data, and Digital Assets, World Economic Forum



Tokenisation is a digitised way of holding an asset wrapped in a programmable layer.

Tokenisation is the process of converting ownership rights, and an asset into a digital token held on a blockchain or a DLT.

WEF consider that this tokenisation and the new models are going to enable new markets by decreasing barriers to entry and friction to the information exchange and trade. We have already seen some of this happening with stablecoins and other kinds of innovations that have happened in the space.

Tokenisation is going to enable new markets by decreasing barriers and friction to the information exchange and trade.

What is interesting is the idea that we can take a process that was very onerous and analogue and turn it digital. Therefore, it becomes much faster to take an asset and break it down into pieces and share the ownership of that. You can do this with future earnings, can create exciting futures contracts on these things.

The blockchain gives you an immutable record-keeping system, so the slice of ownership becomes like a contract. With smart contracts technology, you can program in the rules around that too with the underlying asset and store all of that on a blockchain. This is very analogous to securitisation processes that have been around for a very long time; in fact, some of the risks are similar.

What a digital asset or tokenisation really enables?

Currently, we see a lot of consternation from the banking industry on cryptoassets. One of the reasons for that is that "correspondent banking" remains so powerful due to how global liquidity functions.

We are able to move value across continents based on banking relationships.

We can send money across borders, because our banks have a relationship with banks or financial institutions in other countries, whether directly or indirectly, and what is coordinated are the ledgers of those correspondent banks.

However, if the bank stops having that relationship, that liquidity is gone and with it goes the opportunity to move that money across the border efficiently. This all goes away with the digital asset.

Because the digital asset is the book entry and the unit of value, we can move liquidity around the world immediately indirectly.

We do not need correspondent banks, in theory, to keep ledgers and balances around the globe. These are balances that can be retracted if a bank decides that holding a balance in a jurisdiction is risky for whatever reason. Certainly, de-risking has been a significant issue in the wake of financial crises and other things that are happening.

We are seeing this ability to move value not only faster, but cheaper.

Resistance

There is resistance from certain incumbent actors in the sector, because of the potential of the cryptoassets and what they represent. One of the main reasons we are not seeing, even more, take off in this area is because some of the incumbents do have vested interest in the current systems remaining the same.

Benefits

The ability to represent ownership of real assets on Blockchain can change asset management.

The potential for **financial inclusion** is one of the most critical aspects of digital assets. Right now, high-value investments are just not available to the vast majority of the global population.

The expansion of capital markets could be quite profound; it is an evolution in capital mobility and the ability to raise capital, whether it is by entrepreneurs or in a microlending. The reason is that there are no territorial barriers.

An investor from anywhere in the world could invest in things halfway around the world. Sitting in San Francisco, someone could invest in real estate in Greece using Blockchain to secure the ownership.

The potential for **reduction of intermediaries** or completely removing them altogether. Intermediaries and third-party brokers slow the processes down, making them more inefficient, more expensive, and more confusing. Digital assets on Blockchain reduce the risk of adding error because of the way the tech can be used to code in some of the rules.

The potential to **lower investment risk** creating more global, more diverse portfolios, because of the potential for incremental ownership of a lot of different assets.

The potential to **improve liquidity**. Liquidity of tangible assets is critical because of the potential for fractional ownership.

Overall, in the kind of best-case scenario, the globalisation of capital that results from tokenisation models, could increase the demand and ease market entry barriers, which could lead to the diversification, growth and more inclusion in the market.

Regulations

The question is how tokenisation can make illiquid assets in this way more accessible, but without creating new financial risks, whether those are individual risks or systemic risks.

They are good reasons why it is not easy to do some of this in the analogue world, and some of those risks carry over into the digital world.

We want market integrity; we want consumer protection; there are real risks around asymmetric information or fraud. With e-commerce marketplaces, we did not imagine fifteen years ago that there would be a way for a platform to help reduce information asymmetry and it remains to be seen that innovators here cannot or not willing to do the same.

Blockchain is a self-regulating technology, and the software can help with things like automated payment of taxes, for example. However, there is a lot that the tech cannot do.

We would not certainly advise letting the industry self-regulate.

We have seen how that has gone in other contexts, and that is not something that any of us, at the World Economic Forum, are interested in porting over into this new space.

The World Economic Forum thinks that we need a very global and multi-stakeholder approach.

We think we need a consultation with the private sector, engagement with civil society organisations and multiple jurisdictions collaborating and working together.

Current regulations are very siloed and very country specific. In theory, there is this global access that is limited by the lack of global regulatory alignment.

There are issues with security infrastructure, safety regulations or property rights enforcement. Taxation itself is very complicated, and this new model has not made easier, if anything, it has amplified some of the complexity.

Areas to focus on

Authentication of the underlying asset. On products like mortgage-backed securities, we saw a lot of the slicing and dicing happening. These highly risky pools were shipped off to unsuspecting customers, and we all know what happened.

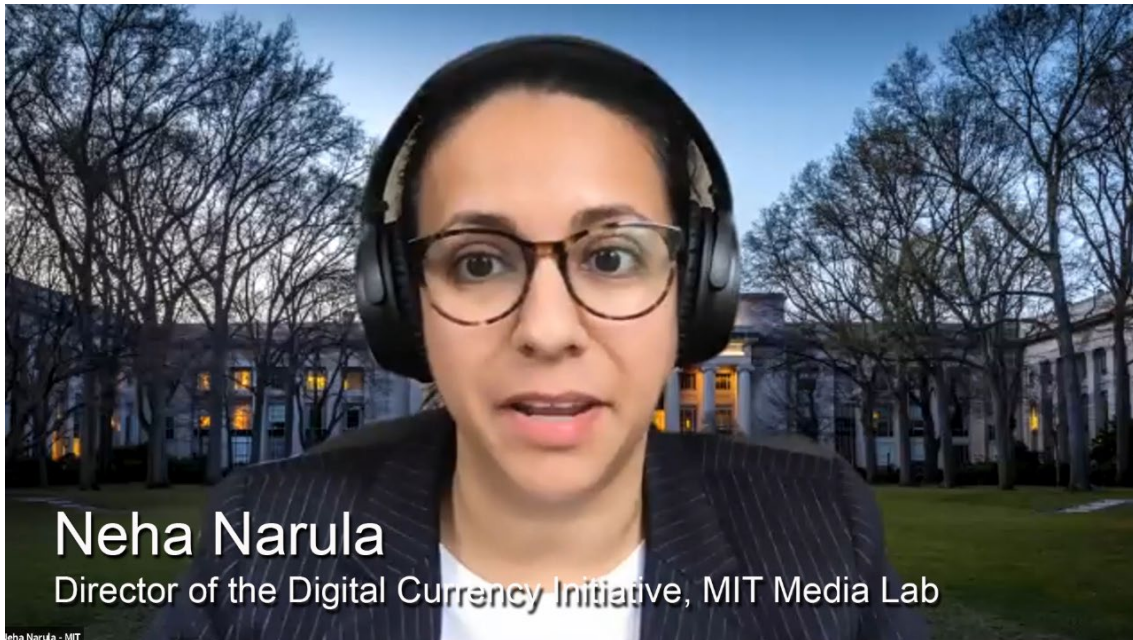
It is crucial to make sure that there is authentication on the underlying asset linked to the token. The value of the tokens will be undermined if that linkage is not real. Explore how to do that and what kind of regulation makes that more possible is crucial.

Governance. For instance, if a building is divided up across 100 people, how to ensure there is responsibility for maintaining the building and someone is not selling a crumbling depreciated asset? Someone still has to manage the underlying asset. Therefore, it should be ways that regulation could ensure that there is some check in place to make that happening.

How to create a market around certain things. For example, a farmer who can sell the rights to her future crop yield and that incentivises her and incentivise the government to help her to create more yield. However, how a market like this can be created or how these markets provide access directly to an individual shareholder farmer. It is not very realistic in the current scheme.

The need for clarity. We do need clarity in the methods of creating and exchanging tokens, but not just domestically. We need that to be a global or at least International as a lot of this activity is going to happen across borders.

4.3. Neha Narula, Director of the Digital Currency Initiative, MIT Media Lab



We have the opportunity to rethink the way money rails work

The Digital Currency Initiative (DCI) is a research group located within the MIT Media Lab. The mission of the group is to do the research necessary to make easier to move value as it is to move information.

The initiative is focused on doing rigorous neutral research while serving the public good. It is a group of computer scientists and open source software developers who have been working on cryptocurrency and blockchain technology since for some of us since 2010.

In addition, the DCI is engaged in a sponsored research agreement with the Federal Reserve Bank of Boston, in order to design, build, and test a robust hypothetical digital currency platform that can meet the needs of a National Retail payment system. Very technology-focused, still very much in the research stages but looking at building out the technology in order to potentially build a central bank digital currency.

Opportunities

The opportunities for the use of Blockchain technology on digital assets are many. We have the opportunity to rethink the way money rails work. We have the opportunity to upgrade a lot of very slow, very inefficient, and sometimes physical systems. Some of the software running inside of the most important computers in the banks is written in a language that was developed in the

1950s.

There are many technological advances that we can take advantage of and many ways to think about redesigning some of our software systems. The potential is quite extraordinary.

How to be responsible? Technology Risks

We have to be cognizant of not only the risk in the technology but the incentives of the participants who are involved and speaking about the technology.

It is not clear that it is best to follow the path of large internet platforms.

The web and the internet started as a very open competitive landscape evolved into monolithic companies which emerged with control over many aspects of our digital lives, including civic discourse. This was all entirely unexpected and was not necessarily predicted.

Large internet platforms have emerged as de facto gatekeepers over what news we see or what programs we can run on our mobile devices. We are scrambling now to try to backfill, to figure out how to regulate these companies that have become immensely powerful, and how we want to think about privacy and ownership of our data.

In this next era for digital money and new financial systems, we need to be very thoughtful and focus on open, accessible platforms which promote competition and choice.

We might be tempted to rely entirely on the exciting developments in the private sector for innovation. However, the ethos of "move fast and break things" is not going to work for the global financial system. Central banks, which are responsible for safeguarding financial stability, are rightly entering the fray to understand the risks and the promises of the technology more deeply.

We need to deeply interrogate the new technologies and examine their underlying incentive structures.

Many stakeholders will propose that "blockchain technology is best suited to build upon to create economic innovation". We will hear a lot about blockchain systems, and systems that utilise blockchain-like data structures.

Unfortunately, it is not possible to simply hide all of the systems behind the label of blockchain technology. We have to get into the details; we have to understand what types of features the system support and what their risks are.

Security and Incentives

"Whenever we hear the phrase blockchain, we should remember to ask, which blockchain?"

They all have different designs that feature security properties and incentive structures.

Saying something uses blockchain is like saying, I am going to travel between Cambridge in London using transportation. What does that mean? That could be a boat, a 737, a canoe. There are many different ways to transport yourself that has many other properties and will result in very different speeds and times and safety.

There are many different ways to build these new economic structures with tokenisation and securitisation and some of which might not require a blockchain and might, in fact, be built using centralised systems with a new interface.

We are currently in the research phase of this; we need to make sure that we are including neutral, unbiased rigorous technology researchers in this conversation.

"By using cryptography and new distributed systems DLT technology has the potential to remove trusted third parties and intermediaries."

Unfortunately, these systems are very challenging to get right; sometimes, they can have very subtle bugs. A lot of projects in the space are quite immature and have not yet had the time and attention put upon their software in order to vet their systems.

We might hear a lot of projects say that we are open source, and so this means that we are secure because anyone can see what we are doing. But unfortunately, in practice given the hundreds if not thousands of different projects out there, it is not often the case that every open source project gets eyes and attention on them.

For example, in 2017 my team found that one cryptocurrency project, called Iota, was not using best practice cryptography and had written their own cryptographic hash function, this is considered a "no-no" when building secure cryptographic systems. This project was totally open source, but it turned out that no one was looking at the code, no one had taken a look at their hash function to see what it was doing. This was a massive security hole meaning that people could potentially lose access to their funds.

A lot of these projects do not necessarily have the system set up in place to even talk to people who are finding these types of security holes. The incentives are not quite aligned either; the technologists sometimes are not necessarily incentivised to share the potential problems with

their systems with regulators, because the technology is so tightly connected to financial incentives in the form of tokens.

In 2017, many projects did these things called ICOs, and many are now being held to account for doing unregistered securities offerings. Even those that did not directly sell tokens to the retail public often engaged in practices like minting vast numbers of tokens and holding them inside of a non-profit foundation or a company, for example, Stellar and Ripple are two projects that did this.

Because the foundation and company, which houses most of the developers on the project, hold so many tokens, they are incentivised to make the price of that token go up, that often ends up sneaking into the work that they are doing.

In contrast, other cryptocurrencies or projects, for example, Bitcoin, have not done an initial token sale or minting. These are very different than security tokens or projects where the token is supposed to represent some kind of asset that exists in the real world. We have many kinds of financial incentives and different types of tokens.

A substantial risk of tokens that are representing assets in the real world is who is monitoring that linkage and who is making sure that the asset is accessible to whoever holds the token and keeping tabs on the counterparty risk of the potential entities that are holding these assets.

In summary

The technology here cannot be abstracted away.

It is critically important to the risk, to the failure modes of this different software, to the risk of consumers and, to the risk to counterparties.

We have to sort of interrogate the technologists, who are building the systems and explain to us,

- Where there might be potential security holes
- Where things might have been glossed over or done sort of more quickly
- Where they have not figured out the answers around scalability around privacy and security.

Many the most popular blockchains today are completely public; all transactions are visible to everyone in the world. This is something that is going to work for inclusion and our future financial system. Blockchain technology has tremendous promise

"It is important to do due diligence on the incentives of the people and projects to get to the details of what is going on".

4.4. Teana Baker-Taylor, Director, Looking Glass Labs



"The promises of tokenisation are starting to come to fruition. The growth and maturation of the digital asset market continue".

The growth has been aided by discussions like this which facilitate more informed policy decisions and greater regulatory clarity which we still lack on the whole.

Just over a decade, Blockchain and cryptocurrency have gained mainstream attention and then encouraged governments to rethink money. Economic indicators demonstrate shifts and trends after they occur, not necessarily during the inflexion point, which is where we are today.

Early cryptocurrencies led to the emergence of tokens with a variety of mechanics and unique utilities of economic and technical functions. For example, different types of tokens that enable access to a service or payment or that account for an asset and increasingly tokens can simultaneously now perform several functions.

We all were aware of 2017 and the ICO (Initial Coin Offering) boom, however, token sales continue to be an important funding mechanism for innovative start-ups, enabling rapid evolution within Blockchain and open decentralised technology.

Many entrepreneurs have found that token offerings better enable a community-driven, network effect, business growth mechanism, which is more aligned to their business models than traditional venture capital funding.

"Tokenisation, on the whole, enables cost reduction, new economic incentives, innovative value creation".

For example, Filecoin is creating some systems for decentralised cloud data storage where users can pay to store their own files or be paid for offering unused storage space back into the network.

Decentralised Finance (DeFi)

One evolving area is DeFi or decentralised finance, which is an open finance movement built upon public programmable blockchains like Ethereum.

DeFi uses smart contracts, automated enforceable agreements, that do not require intermediaries like banks or lawyers but rely on blockchain technology instead. DeFi proponents endeavour to disrupt mainstream financial services such as lending, asset trading, payment services, and insurance by operating without a central authority.

DeFi has experienced explosive growth in 2020, the total US dollar value currently locked in decentralised finance protocols today exceeds \$11 billion, according to the on-chain data resource DeFipulse.

Crypto.com and Boston Consulting Group recently published a report summarising that regulation and governance have given centralised finance and an enormous proportion of the value generation from financial services. Whilst DeFi may be perceived as a threat to centralise finance; this report proposed a roadmap for financial leaders to build a new generation of politically and technologically resilient financial solutions that may be more relevant for today's digital economy.

By removing some of these mediaries and automating functions, DEFI can lower costs, provide higher degrees of security and privacy, and increase accessibility.

"The ability to borrow or deposit funds, to take out loans into an account without asking for anyone's permission is gaining traction."

For example, the DeFi service Compound boomed when it launched its CompToken in June of this year. Users who provided the liquidity to the Compound services are into CompToken as a reward, thereby earning returns on their assets. Many different platforms have since adopted similar incentive mechanisms which have caused the value of the assets and DeFi to surge.

Due to its level of accessibility, DeFi may enable greater availability of financial services such as credit and investment opportunities to people whose access has been previously limited; this is where the inclusion piece comes in. However, DeFi concept is still in its infancy, and it is not without its risks.

DeFi Risks

Today, the over collateralisation required for borrowers to access DeFi loans makes it a bit impractical for the mainstream unless they are already crypto owners. Many DeFi protocols require a level of knowledge to us, without which users can inadvertently be exposed to additional risks as,

- Slow blockchain throughput
- High transaction fees
- Limited liquidity
- Security and smart contract risk related to vulnerabilities that might put assets at risk
- Bugs in the code that may allow for price manipulation.
- Regulatory risk.

DeFi & Regulations

DeFi operates within areas that traditionally have had significant oversight from governments and regulators who are in charged with protecting consumers from high-risk products and scams.

However, DeFi protocols have been designed to be permissionless, which allows anyone anywhere to access them without regulatory compliance. Whilst this democratises DeFi for the greater good, regulators have concerns that DeFi could be exploited by nefarious actors.

DeFi could be regulated in a partially permission model using decentralised KYC (Know Your Customer) and AML (Anti-Money Laundering) methods to authenticate identity and potentially block users that are deemed to be unsuitable.

Crypto-usage and crypto-based services

Crypto-usage and crypto-based services are also beginning to the mainstream; a number of digital asset exchanges have begun integrating everyday Fiat payment services like PayPal. Numerous merchants, like AT&T, have started accepting crypto payments for their services and crypto-funded credit cards, enabling crypto-users to transact with crypto through traditional payment rails have become very popular. Numerous members of the US Congress are accepting 2020 campaign donations and crypto

"It has become clear that digital assets can do much more than replace fiat currencies."

From art to real estate, across traditional financial markets, the tokenisation of real-world assets can enable us to see changes in the democratisation of wealth creation.

HSBC recently published a report and titled *"The 10x potential of tokenisation"* stating that the total market size for global fixed income and equity was worth approximately \$ 178 trillion in 2019. However, the 43.9% of global wealth is held by only 0.9% of the world's population, more than half of the worldwide population is collectively holding a mere 1.8% of the world's wealth. HSBC summarise 84% of the world's population would need to say for more than two years to afford a share in each of the top five market cap companies.

That group would benefit from affordable access to a broader range of investable assets. Tokens are divisible, fractional investment opportunities can be created, and anyone could purchase one 10th or one 100th of a share of Apple or Amazon. Fractionalisation would make it more affordable for a larger part of the population to participate in equity markets. With the use of blockchain technology and greater regulatory enablement, this is not impossible to achieve.

In conclusion

"Most of this innovation is occurring in spite of government support and regulatory clarity, despite many of the digital asset industry advocating for regulation."

For instance, AMLD5 (5th Anti-Money Laundering EU Directive) and the revised FATF 40 recommendations have done to address, money laundering and terrorist financing concerns. These global and regional directives have aided and reducing some of the cross-jurisdictional regulatory arbitrage.

The European Commission recently published a new draft bespoke regulatory regime for the entirety of Europe. Once implemented it will provide,

- A level "passportable" regulatory playing field in Europe
- A level commercial playing field for industry participants
- The regulatory clarity and institutional access

These measures will enable innovators to invest and develop their future roadmaps and build profitable businesses in Europe with confidence.

The UK has taken a slightly different approach, focusing on market activities individually versus addressing the industry as a whole. Following a series of consultations, the UK does not appear to be much further forward and establishing a clear regulatory framework for cryptoasset innovation in the UK.

The UK has a rich history of supporting innovation and fintech; however, digital asset innovation has not received the same level of proactive consideration. With Brexit looming and with other competitive global financial centres such as Hong Kong, Singapore and Europe establishing clear rules of the road for digital asset integration into traditional financial service markets, the UK risks being left behind.

"With Brexit looming and other competitive global financial centres ruling the digital assets, the UK risks being left behind."

By building the infrastructure to support new marketplaces, we can begin to lay the groundwork for the opportunities emerging from tokenisation to bloom and maintain the UK position as a Global Financial services centre.

4.5. Roham Gharegozlou, CEO & Kitty Business, Dapper Labs



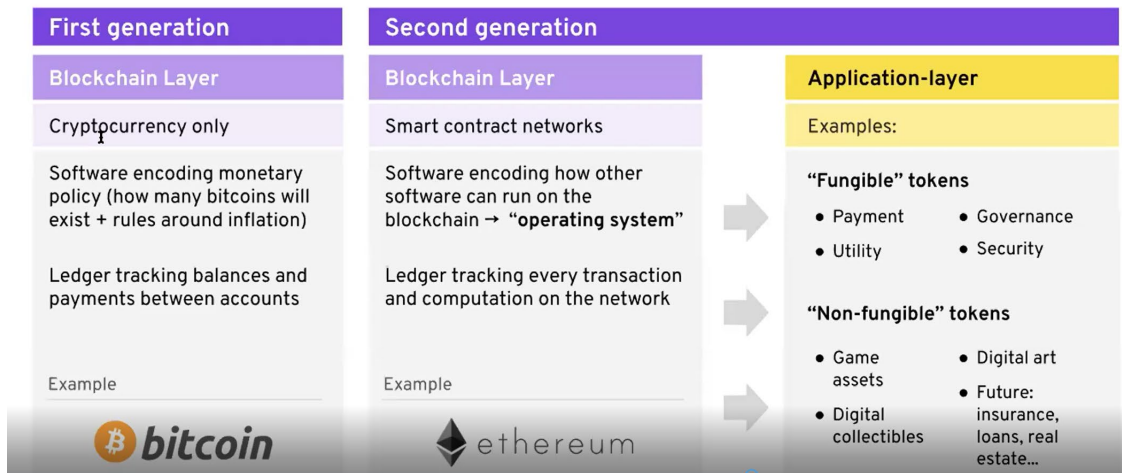
"Blockchain is effectively a new kind of computer that can run new kinds of software applications."

Different kinds of blockchains can run different kinds of software applications. The first generation blockchains, like Bitcoin, can really only do one thing host a digital currency and manage the ledger of who owns what. Consequently, it hosts an economic system outside of anybody's control.

In the case of newer generation blockchains, as Ethereum, called smart contract networks or general-purpose blockchains, these are computers on which anyone can write any kind of application usually called smart contracts. However, the reality is that smart contracts are not contracts, and they are not really smart. They are just software programs that can run autonomously and control tokens as part of their operation.

If smart contracts on blockchains are analogous to software on your personal computer at home, then the token is essentially the files that the application needs in order to do its job. There are different kinds of tokens, payment tokens, utility tokens and so on. But we broadly see them as two categories fungible and non-fungible tokens.

What is tokenization?



Benefits of Tokenisation

We have heard about the benefits of putting things on blockchains, transparency, auditability, security, chain of custody, provenance and all those things are accurate. But the most significant step function change that happens, the thing that enables all of these sorts of effects is that when you put a piece of software on-chain and when you put an asset on-chain in the form of a token, that piece of software, that asset, essentially functions as a digital public good.

A piece of digital commons, something that once it is deployed, nobody can change, anybody can build on anybody can use just by showing up with the token.

"When you put an asset on-chain in the form of a token, that piece of software essentially functions as a digital public good."

The term permissionless was defined as it cannot be regulated it; however, that is not what permissionless means. Permissionless means nobody can stop you from using it.

"Permissionless means nobody can stop you from using it."

In a world where the vast majority of our lives are digital, and those digital worlds are controlled by massive software companies that are not being transparent with us, Digital Commons are more crucial than ever.

The nature of permissionlessness is the fact that companies like us and the sort of new generation of internet companies cannot stop a user from accessing their data. We cannot stop a developer

from building an alternative version of our product on top of our network and users leaving our product to use it through the new product.

It means choice. It gives consumer choice back to the individuals; it lets developers and start-ups and innovators build on top of data without fear of being locked out; it allows the software to be a kind of public good that compounds over time; it is global and international; it can solve specific problems that small groups of people can get around and coordinate.

"If Blockchains are public computers, tokens are the fuel that makes them work."

How can tokenisation become a reality?

We started in crypto back in 2014 we built CryptoKitties back in 2017, since then, we have been developing a new generation of products. Our goal since the very beginning has been to show people that blockchain and cryptocurrency go way beyond currency and way beyond money.

"Blockchain and cryptocurrency go way beyond currency and money."

The reason we created CryptoKitties, the so-called **non-fungible token standard** because almost every cryptoasset before CryptoKitties was a fungible asset. It was either a currency or commodity and, in a sense, fungible means that it does not matter which specific item you own it only matters how many, Bitcoins, US dollars, the UK pounds, etc.

But most things in life are non-fungible, the homes we own, the art we own, our progress in a video game, our data, our friends are those things are non-fungible. We wanted a cryptographic primitives* to represent those kinds of assets so that non-fungible tokens are now a standard part of the Ethereum network.

If the fungible token is the fuel, the non-fungible token is kind of the building block with which you can build a more interesting world.

We already see it apply to digital art, CryptoKitties is a video game, but the art pieces, the kitties themselves have been taken out of the video game and displayed in museums all around the world. They have been auctioned by companies like Christie's where a single cat was bought for over \$140,000. It shows the power of digital assets that are bigger than its creators, and that actually will live on, no matter what happens to the person that originally made them.

We are already seeing non-fungible tokens being applied to all kinds of other things. For example, individually unique insurance policies, where a specific policy can be tokenised and sold on decentralised markets with perfect transparency and no information asymmetry because everything is open for everybody else to see on this public computer

The concept of a public computer is a critical thought for policymakers because it is a demonstration of a new relationship that people can have with the products that they use every day and the developers can have with the business opportunities. Fundamentally, it means more competition, more choice and a better outcome for everybody.

The concept of a public computer is a demonstration of a new relationship that people can have with the products that they use every day

One of our investors and advisors considers on-chain is an evolution of online and tokens are just digital assets that have been put on-chain.

"On disk, Online, On-chain. On-chain is like the third level of deployment. Files that only you care about stay on the local disk. Files that are important to others get put online. And files that are really important to others get put on-chain" (Balaji S. Srinivasan)

What will financial institutions need to consider to be part of the token economy?

"Financial Institutions will need to focus on adding value, not being middlemen, not being intermediaries."

We have talked a lot about this you know blockchain will cut out intermediaries. It is a little bit scary to most people because the internet cut out a lot of middlemen. It created some massive companies that have more power than any of those middlemen ever did on society and our own daily lives. They have more money, and more defence ability in a business sense than any of those previous middlemen ever did.

The reality is that those the internet hurt physical intermediaries, but all of those giants that created Facebook Airbnb Uber, etc., those companies are digital middlemen. They wouldn't have any value, and they wouldn't exist if it were not for people like you and me, adding value to them, adding our information to them, bringing our friends to them, being drivers and writers. They ended up putting these walls around their users, preventing other developers from accessing them and in some cases taxing the customer and providing a worse user experience.

Crypto and Blockchain is the first time we can have open networks.

Networks that a customer can use a specific product and then leave that product but not leave that underlying network because the underlying network is open, it is public, and anybody can tap into it. That is the core innovation.

Policy Recommendations

The unclear regulation is hamstringing entrepreneurs

The reality is the entrepreneurs like me, people who want to follow the law, who have more to lose than to win in many cases, are being hamstrung by the unclear regulation. At the same time, other projects can "plough ahead" because they do not care at the end of the day. Regulation is unclear, and so they will probably get a "slap on the wrist".

"Support and clarity for the industry to innovate."

That does not mean a very detailed policy map of what is allowed and what is not allowed, because the design space is too unexplored. Currently, there is too much left to discover for policymakers to come and put walls around what entrepreneurs can and cannot do.

What we need is a safe harbour a period for any legitimate project to try anything. To explore different use cases, to make clear to their customers that the projects are in a beta stage and the products are experimental. We have to go ahead and allow innovation to happen.

This is a "step function" change for the world on the scale of the Internet and the World Wide Web.

The difference is that this time. China is way ahead of the West in terms of their understanding of the technology and their buying at the policymaker level. What they are doing is building a closed version of everything that we just talked about, building a highly controlled version that is transparent but to them and under control of them.

For industry, people like us, hamstrung by this discussion around what is allowed and what is not allowed.

"Safe Harbour and the ability to innovate."

On behalf of every entrepreneur in the space, we need a safe harbour to test our innovations. Most of the people are in the space because they want to make the internet and more open place, all of us grew up in the 90s and early 2000s and are caught by surprise by how much things have changed.

There are ways with any technology shift that the technology can be misused, however, at the end of the day, the truth will win out, and we will end up with a more open world.

4.6. Official IOTA Foundation Statement

In the light of some of the comments made in the meeting about IOTA Foundation, the foundation has submitted a statement to the APPG Secretariat in response to the references to the company's practices,

Official Statement: IOTA Foundation

"In IOTA's early experimental phase from 2015, a custom hash function was designed for IOTA's unique ternary architecture. There existed no ternary hash function at the time, and we made our efforts known publicly. In 2017, we reached out to a Media Lab collaborator to commission a formal audit of our custom cryptography. Unfortunately, they were unable to help us.

However, a few months later the Media Lab team published an independent vulnerability report. In response, the IOTA Foundation replaced the custom Curl-P hash function with one based on the tried-and-tested Keccak algorithm. We have since commissioned research in the field of ternary cryptography (<https://link.springer.com/article/10.1007/s10623-019-00673-2>) and now work alongside well-known security experts - Bill Buchanan OBE and Mauro Conti are members of the IOTA Research Council.

As an organisation, the IOTA Foundation continues to mature and grow. In our efforts to improve governance, we have joined forces with the Eclipse Foundation and the Object Management Group to form the Tangle EE working group (<https://tangle.ee/>). Our collective commitment to open source, enterprise standardisation and not-for-profit technology forms a solid base for IOTA's future.

Working with our industrial partners, we have made the decision to transition to an orthodox binary architecture, with a standard hash function (BLAKE2b) and signature scheme (Ed25519), as part of a protocol upgrade codenamed Chrysalis. Chrysalis is a major step forward for the IOTA protocol, increasing network throughput, further reducing the (already low) energy consumption, and vastly improving the user-friendliness of our ecosystem. All components are currently undergoing rigorous internal and external testing and audits. The upgrade is due for completion in Q1 2021."

IOTA Foundation

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