

All-Party Parliamentary Group on Blockchain (APPG Blockchain)

Evidence Meeting 5 – Impact on People Overview

**Boothroyd Room, Portcullis House
16th October 2018**

The mission 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.

We bring evidence, use cases and future policy scenarios while considering industry and societal implications as well as environmental opportunities.

Chaired by Damien Moore MP

Watch the full evidence session, <http://tiny.cc/EvidenceMeeting5>

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1. Details

- Date: 16 October 2018
- Time: 5:30 – 7:00 pm
- Location: Boothryod Room – Portcullis House

2. Purpose

Evidence Meeting 5: Impact on People. The fifth APPG blockchain meeting was held on Tuesday 16th of October in the Houses of Parliament. The group discussed the impact of blockchain technology on the impact on people.

3. Evidence Givers

- **Paul Domjan**, Global Head of Research, Analytics & Data, Exotix Capital
- **Liam Bell**, Research Lead, Blockpass & Research Fellow at Edinburgh Napier University
- **Marcus O'Dair**, Associate Professor, Middlesex University
- **Elizabeth Renieris**, Global Policy Counsel, Evernym
- **Robert Schwertner**, Founder, CryptoRobby Consulting
- **Sheli Gupta**, President, European Operations, Hu-manity



4. Questions for Inspiration

- Blockchain will change our economy, but will it also change our lives and the world?
- What is the impact of blockchain on people and society? Does it change how we live our daily lives?
- Is blockchain only about business and intermedia?
- Can blockchain blur public and industry divide and ensure peer-to-peer relations with no intermediaries, minimising costs, ensuring trust, and bringing a sense of ownership?
- What is a digital print of the society and what does it mean for the new generations?

5. Summary

The group met on October 16th, 2018 for a fifth evidence meeting focused on Impact on People.

This was one of the most vibrant meetings thus far which even more highlights how important the very subject of a person is in this context. We welcomed speakers ranging from lawyers, music professors and data analysts, to crypto assets experts and blockchain in pharmaceutical representatives. With such a variety of perspectives, the discussion focused on personal data, which also shows how impactful the data-driven economy is on the society, and how blockchain transforms the meaning of privacy, ownership and lastly identity.



5.1. Blockchain as a tool

“Blockchain alone will not change anything, it is merely a technology, a tool, a means to some end” – said **Elizabeth M. Renieris**, Global Policy Counsel at Evernym, to which the whole room of people nodded.

While Elizabeth explained later why and gauged even more support, **Paul Domjan**, Global Head of Research at Exotix Capital opened the debate with how this tool can be utilised in emerging economies with a much better effect than in established ones. Paul rightly pointed

out that the new technologies are adopted when innovation is good enough to replace an existing technology or business process. The impact of new technology can happen faster and be greater in developing economies because the current technology or process is often weaker.

One of the examples Paul provided is mobile phones, which created at least twice the impact on productivity in developing countries as in developed ones. This argument was backed by giving us an analogy of going back to the 19th century where railroads provided a far more significant incremental improvement in countries without a pre-existing system of canals.

“Railroads improve transportation. Mobile phones improve communication. When railroads arrived, developing countries had weaker systems of transportation than developed countries. When mobile phones arrived, developing countries had weaker systems of communication than developed countries” (Paul Domian, Exotix Capital)

For **Marcus O’Dair**, Associate Professor at Middlesex University, blockchain can be a transforming tool for creative industries. While giving us a great example of two groups of people in this field; those who work in creative industries, and those who “value” creative work, Marcus focused on blockchain as an opportunity for creative economy about ownership.

“We can understand the value of the creative economy in aesthetic terms, as we might if we are lovers of music and art and literature and computer games and architecture. We can also understand the value of the creative economy in political terms, for the soft power they convey – consider the centrality of Shakespeare and The Beatles to what is sometimes known as ‘brand Britain’. We can think too of the social value of the creative economy, for instance, the relationship between the arts and wellbeing. And finally, there is the economic value of the sector, which contributes £92 billion a year to the UK economy.” - **Marcus O’Dair**, Middlesex University

5.2. Data Ownership and Privacy

Marcus O’Dair considers that Blockchain can create an unbreakable link between artists and their work by inextricably linking a data file, for instance, a song or a film, to its relevant metadata. He explained how this opportunity lies not just at the level of the individual work. Copyright information is currently stored in centralised, siloed databases. These are typically incomplete; at times, they conflict.

The second opportunity offered by blockchain technology lies in the possibility of a distributed network, alternative to the current centralised and siloed IP databases: a single source of truth

as to who has the rights to a given song or piece of film footage as an aggregated view of ownership.

Thirdly and finally, there is the possibility of automating the licensing of these works – making it easier to use creative content. The crucial piece here, in terms of reducing friction, is the so-called ‘smart contract’ or programmable transaction.

Smart contracts can also make royalty payments far more efficient: although we currently stream creative content at the swipe of a finger, it can take the creators of that content, months or even years to receive royalties. In the streaming era, we also need to keep track of more payments than ever – for every use, not just for each one-off purchase – but the sums involved are typically tiny. Low transaction costs, of course, are key for micropayments.

There are, of course, problems and blockchain technology does not offer a silver bullet. For example, the technology cannot solve the ‘*garbage in / garbage out*’ problem, so you still need to get the right information on the ledger in the first place (although arguably tokens could play a role here). And there remains the challenge of ‘breaking the chain’ – explains O’Dair.

There are even potential risks, just as the internet has been both good and bad for creators. Blockchains could facilitate the illegal storage of digital works in a way that, because it is distributed, makes the content very difficult to remove. ‘Notice and takedown’ procedures would be ineffective in such a scenario.

To Marcus however, the technology does indeed have disruptive potential – but there is no guarantee that this potential will be realised- he says, and even if it is, adoption may be slower than some predict.

It is also far from certain that this transformation will be in the interests of creators and consumers. Arguably, blockchains could usher in a new era of digital rights management in which the problem is not that intellectual property rights are not enforced but, instead, that they are enforced too strictly.



When it comes to data ownership, **Sheli Gupta**, President of European Operations at Hu-manity, offered a radical solution of a platform that allows you to sell your own data. Sheli argues that it is your 31st human right to be in ownership of what information you give out and that you should be paid for it as the tech giants are for selling your data on platforms.

Blockchain APPG @appg_blockchain · Oct 16
 Sheli Gupta: the incumbents won't change, they'll adapt

Thanks for your contribution at the #APPG_Blockchain in London @hu_manityco



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Hu-manity sees personal data as property and it does indeed raise a lot of questions:

1. ***Is it ethical to commercialise (assign a monetary value) pieces of individual identity (personal data)?***
2. ***How will human relationships change if we become commodities?***
3. ***Can we function in a society where each transaction is economic?***
4. ***How should the market-oriented economy change to allow for data-driven society?***
5. ***How will our identities change in a self-sovereign digitised model?***

Contrarily, **Elizabeth Reniers** Global Policy Counsel at Evernym was opposed to the idea of selling your own data. She says that the way to disrupt the status quo is to challenge life assumptions. What she says could be different with data ownership is that you would have to negotiate ownership but if we start with the premise that data is owned and not negotiated, we end up with the same broken model.

She argues that there is indeed a fundamental right to liberties and control, but not ownership. **The real risk is to accept that personal data is contractual in the old system. If you want to value the data there's got to be a better business model.**

5.3. New Identity and Trust

The debate on trust was also picked up by two of our speakers and later followed with everyone from the audience. *“Trust is the oil that lubricates the global economy, and it is typically provided by an intermediary”* – says **Paul Domjan**, who continued to explain how blockchain creates trust in the developing world.

One of the examples he gave is paper money which is backed by the central bank; while the credit cards are issued by an established and trusted network, like Visa or Mastercard. Another, property ownership of the house which is established by a land registry, and incomes are validated by our bank statements or tax records.

The transaction can take place using trust in these institutions because the buyer and seller both trust an intermediary rather than one another.

With relation to developing economies, many of these institutions of trust are weak or non-existent. Additional problems exist concerning establishing and enforcing contracts.

Paul discussed that contracts are essentially a set of pre-agreement responsibilities between two parties and a set of rules for how both to execute these responsibilities and to handle disputes. Contracts are essentially an instrument of trust, but in this case, the trust is in the legal system as a trusted third party to ensure execution of the contract. As with other areas of trust, mechanisms for enforcing contracts tend to be weaker in developing economies.

Finally, he points out that Blockchain is fundamentally a technology about trust. At its essence, blockchain technology provides trust between two parties without the need for any third-party to act as an intermediary.

“Because developing economies, and especially the smaller frontier markets, have weaker institutions of trust than developed economies, and indeed larger developing economies, it is much easier for blockchain technology to be good enough to offer an alternative to existing technologies in these markets” – Paul Domjan, Exotix Capital



Blockchain APPG @appg_blockchain · Oct 16
Liam Bell: not sure we will be rewarded for all the data we may provide

Thank you @LiamJohnBell for your engaging contribution at our evidence session at the #APPG_Blockchain



Liam Bell, Research Lead, Blockpass & Research Fellow at Edinburgh Napier University echoed **Paul Domjan** and agreed that blockchain allows us to have trust especially if you look at the supply chain. For example, in relation to medical access- *“that is where verified institutions can be supported by blockchain”*- he says. Liam Bell who discussed his work on Blockpass, an identity

management system, does not believe that blockchain will remove intermediaries. He believes that regulators will always have a role to play, but they can be brought to the government in a more efficient way, thanks to this technology.

Identity, in fact, was the topic discussed by Elizabeth M. Renieris from Evernym who believes that this tool can have a transformative effect if coupled with changing attitude towards privacy and data protection, identity, and how we architect trust.

Self-sovereign identity (SSI), Sovrin, is a product of Evernym developed on blockchain that leverages the features of blockchain to radically restructure how we interact remotely.

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Andrew Tobin @ACTobin · Oct 16
@hackylawyER giving evidence to the UK All Part Parliamentary Group on Blockchain on the impact of #selfsovereignidentity on people. @evernym @appg_blockchain



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Elizabeth Reniers used the word “remote” and not “digital” because in the future all our interactions will be digital (since everything will be digitised)- she argued. Elizabeth further explained that the difference is not therefore whether you present a paper or digital credential, it’s whether you trust in its verification in person by a human (e.g. comparing their visual scan of your face against the photo in

your paper passport) or else remotely via a machine (e.g. utilizing your biometrics + the blockchain to verify its validity).

“Put differently, it’s whether there is a technical intermediary to trust for verification purposes. In the case of blockchain, that technical intermediary is more accessible, transparent, auditable, and — with proper design and governance — (arguably) more trustworthy than the alternatives” (**Elizabeth Reniers**, Evernym).

“SSI is a new paradigm for how we interact in the world on the basis of digital information (i.e. data). Rather than organizations controlling large centralized data stores and mediating our access to services, SSI puts the individual at the centre of her data universe and enables private and secure peer-to-peer interactions between individuals, organizations, and even things. In the SSI paradigm, there is an equalizing function as between individuals and entities interacting as peers, requiring mutual authentication and trust (rather than the one-way trust we require in remote interactions today, e.g. not only do you authenticate yourself to your bank, but your bank has to authenticate itself to you). If we succeed with SSI, the result would be that our remote interactions would feel more like our proximate (or face to face) ones — in this way, it would be both new and familiar at the same time”. - **Elizabeth M. Renieris**, Evernym

5.4. Social Impact

Robert Schwetner, Consultant & Founder at CryptoRobby discussed how blockchain could become an incentive for good in society. His work focuses on how blockchain can be accessible to all and not just sectors, such as banking or IT. One of the examples includes energy projects in which tokens can be utilised as an incentive for responsible behaviour. Similarly, the same focus was taken by ObjectTech Group in their written evidence as guest contributors.

Robert Schwetner, Consultant & Founder at CryptoRobby

- We highlight that technology needs to **support changes to be sustainable** and that unless the UK changes some of the short term habits in relation to business, the **benefits of blockchain will not remain in the UK.**
- ObjectTech argues for a cohesive approach building on the success of values-led businesses to date.
- The government needs to effectively support the introduction of a **new digital infrastructure**
 - o support infrastructure required.
- Government support and provide **regulation to encourage ongoing innovation.**
- The government should support **ongoing standards and regulation initiatives**, as well as exploiting its global position to **drive a consensus for harmonised regulation and legislative environments.**
- A **broad and diverse education approach** needs to be aligned to support the disruption.
- The blockchain can be used to **create trust frameworks and ultra-personalisation.** When combined with being **blockchain agnostic and commercially interoperable** exploiting these aspects leads to where growth and benefit lies.

- The new ways of working and living will have a fundamental effect on people. This is especially true as the rise in the **sharing economy and the growth in importance of social value** will require a change in the economic models we currently use.
- The ability to be able to **trust the identity of counterparts will remove intermediaries in business**, as well as in all walks of life, including philanthropy. The change to a trustable way of interacting will change how we work and interact with each other.
- The ability of the new technologies and the trust they engender, together with ultra-personalisation has the power for **many who are excluded or marginalised both socially and financially being able to access social networks (reducing loneliness for example) and tailored financial products reducing poverty globally.**
 - *See Evidence section 7 below for full contribution: ObjectTech Group Ltd*

Annexe I -Written Evidence from Speakers

Elizabeth M. Renieris, Evernym, Inc.

My name is Elizabeth Renieris. I serve as Global Policy Counsel at Evernym, a technology startup building commercial products and services to enable a new paradigm of identity management known as “self-sovereign identity” and new kind of interaction known as the “new relationship” -- I will explain each in turn.

Why am I here giving evidence? I am a US-qualified lawyer, a certified privacy professional in the US & Europe, and a policy consultant. I’ve practised as a government attorney, in-house counsel at two technology startups, and outside counsel with two major global law firms, including with the most preeminent blockchain practice in the US. I am an active participant in the EU Commission’s Blockchain Observatory and a contributor to their forthcoming Thematic Paper on Blockchain and the GDPR. Having lived and worked in 5 countries on three continents, I have a very global, cross-border perspective, which is critical for technologies like blockchain that don’t respect borders.

I was in the same class as Mark Zuckerberg at Uni and have been focused on data protection and privacy ever since. I’ve also been focused specifically on blockchain and distributed ledger technology for the last three years or so. The two are now converging or colliding (depending on your perspective). Given my background, I see the tremendous opportunity for blockchain and related technologies to usher in a new way of interacting with others, but also significant risks if we don’t get it right.

At the outset, I will say that blockchain alone will not change anything as it’s merely a technology, a tool, a means to some end. But coupled with changing attitudes towards privacy and data protection, identity, and how we architect trust, it has the potential to change our daily experiences. With that caveat, I want to focus on one use case — the potential for blockchain-enabled self-sovereign identity to forge a new relationship that is like the “old” offline or real-world relationship but via digital or, more accurately, remote connections.

I use the word “remote” and not “digital” because in the future all of our interactions will be digital (since everything will be digitized). The difference is not therefore whether you present a paper or digital credential, it’s whether you trust in its verification in person by a human (e.g. comparing their visual scan of your face against the photo in your paper passport) or else remotely via a machine (e.g. utilizing your biometrics + the blockchain to verify its validity). Put differently, it’s whether there is a technical intermediary to trust for verification purposes. In the case of blockchain, that technical intermediary is more accessible, transparent, auditable, and — with proper design and governance — (arguably) more trustworthy than the alternatives. SSI leverages these features of blockchain to radically restructure how we interact remotely.

In a nutshell, SSI is a new paradigm for how we interact in the world on the basis of digital information (i.e. data). Rather than organizations controlling large centralized data stores and mediating our access to services, SSI puts the individual at the center of her data universe and enables private and secure peer-to-peer interactions between individuals, organizations, and even things. In the SSI paradigm, there is an equalizing function as between individuals and entities interacting as peers, requiring mutual authentication and trust (rather than the one-way trust we require in remote interactions today, e.g. not only do you authenticate yourself to your bank, but your bank has to authenticate itself to you). If we succeed with SSI, the result would be that our remote interactions would feel more like our proximate (or face to face) ones — in this way, it would be both new and familiar at the same time.

So yes, as set out in the guiding questions, we can say that the promise of blockchain is (in part) to blur the public-industry divide and to ensure peer-to-peer interactions with “no intermediaries,” while minimizing costs, ensuring trust, and bringing a sense of “ownership” (though I prefer the term “control”) to individuals and organizations alike. But I want to caution that the promise of “no intermediaries” is overstated. In the case of SSI, blockchain is effectively a technical intermediary that acts as an independent verification tool to mediate these remote interactions. For the time being, such technical intermediaries are of course controlled by individuals and organizations. As long as we exist in something more than chip and processor form (i.e. as long as we are still more than our data) and as long as real-world inputs must be digitized, we cannot trust technology alone.

Ultimately, blockchain is an interim step towards fully remote peer-to-peer interactions but we’re not there yet. Along the way, we need to build trust and governance. Trust in the people and organizations behind these technical intermediaries and governance in how they are designed and operated to protect our fundamental rights to privacy and data protection. If we don’t get it right, blockchain could pose significant risks, such as creating an immutable record of events that could prejudice our rights in the future, reestablishing silos amongst incompatible ledgers, or creating a presumption against what isn’t documented on a ledger (whatever good reasons there may be for the omission). However, if we can meaningfully solve or engineer solutions for these issues in the design of our technology solutions and (perhaps more importantly) the governance of them, we stand a better chance at having a bigger impact on individuals.

In summary, to the extent that blockchain can be leveraged to strike a new deal on data, adjust the balance of power between individuals and corporates, and make cross-border or global coordination more efficient, it has the potential to bring some critical paradigm shifts into reality. Self-sovereign identity leverages blockchain to radically restructure how we interact remotely, which would be both revolutionary and familiar — resulting in remote interactions that mirror the ones we’ve known for time immemorial in the “offline” or analog world, but with even better verification, less friction, and enhanced trust. If it succeeds, blockchain will be a mere backend technology silently and invisibly enabling these changes in our day-to-day realities. That’s how we will know blockchain works — when no one knows it’s there.

Thus, when assessing blockchain-based technologies, the government should focus less on the technology and more on the relationships we want to encourage and the society we want to live in. Think about what the technology could help enable rather than what the technology IS today. From the government's perspective, that might mean opportunities for enhanced civic participation and constituent or citizen engagement (a chance to revive our democratic institutions). All the while, it is critical to examine the governance behind any implementations or use cases for these new technologies. Especially in respect of our personal data and privacy, blockchain can also pose grave risks if we don't get it right. This is why we need more conversations like this one. I thank you for the opportunity to contribute to the dialogue and look forward to taking questions.

Marcus O'Dair, Middlesex University

I'm here this evening to talk about the impact of blockchain technology on two groups of people. The first is those who work in the creative economy. I don't know how many of you there are in the room. The second group is those who value the creative economy – and I imagine that, in one form or another, that means all of you. We can understand the value of the creative economy in aesthetic terms, as we might if we are lovers of music and art and literature and computer games and architecture. We can also understand the value of the creative economy in political terms, for the soft power they convey – consider the centrality of Shakespeare and The Beatles to what is sometimes known as 'brand Britain'. We can think too of the social value of the creative economy, for instance the relationship between the arts and wellbeing. And finally, there is the economic value of the sector, which contributes £92 billion a year to the UK economy.

I'm Associate Professor in Music and Innovation at Middlesex University, up in Hendon. I'm speaking to you today because I set up a research cluster looking at the impact of blockchain technology on the creative industries. I'm a member of the British Blockchain Association; the DLT working group at techUK; and the DLT committee at BSI. I've done various pieces of research in this space – a 2016 report entitled Music on the Blockchain, and a 2017 white paper for the Blockchain Research Institute – and I've also, as researcher in residence at the Digital Catapult, just written a book for Palgrave entitled Distributed Creativity: How Blockchain Technology Will Transform the Creative Economy.

What I want to do this evening is to set out what blockchain technology can offer the creative economy, before going on to make a few comments about barriers and risks, before concluding with seven quick policy recommendations.

The first opportunity for the creative economy is in relation to ownership. The internet has been great at distributing creative content. It is less good, however, when it comes to ascribing proper attribution. Blockchains can create an unbreakable link between artists and their work, by inextricably linking a data file, for instance a song or a film, to its relevant metadata.

And the opportunity lies not just at the level of the individual work. Copyright information is currently stored in centralised, siloed databases. These are typically incomplete; at times, they actually conflict. The second opportunity offered by blockchain technology lies in the possibility of a distributed, networked alternative to centralised and siloed IP databases: a single source of truth as to who has the rights to a given song or piece of film footage. So it's an aggregated view of ownership.

Thirdly and finally, there is the possibility of automating the licensing of these works – making it easier to use creative content. The crucial piece here, in terms of reducing friction, is the so-called 'smart contract' or programmable transaction. Smart contracts can also make royalty payments far more efficient: although we currently stream creative content at the swipe of a finger, it can take the creators of that content months or even years to receive royalties. In the streaming era, we also need to keep track of more payments than ever – for every use, not just for each one-off purchase – but the sums involved are typically tiny. Low transaction costs, of course, are key for micropayments.

Blockchain technology, then, offers the possibility of improved attribution; of distributed IP databases; and of automated royalties and licensing. The technology also, of course, offers auditability, allowing creators to check that they have received whatever money they are due.

This is not to say, of course, that blockchains offer a silver bullet. The technology cannot, for instance, solve the 'garbage in / garbage out' problem, so you still need to get the right information on the ledger in the first place (although arguably tokens could play a role here). And there remains the challenge of 'breaking the chain'.

There are even potential risks, just as the internet has been both good and bad for creators. Blockchains could facilitate the illegal storage of digital works in a way that, because it is distributed, makes the content very difficult to remove. 'Notice and takedown' procedures would be ineffective in such a scenario.

Given today's theme, the impact of blockchain technology on people, I should mention too that decentralised technologies do not necessarily decentralise power. Don Tapscott refers to blockchain technology as the internet 2.0. Well, the internet 1.0 started with dreams of decentralisation too. And just look at where that ended up.

Blockchains offer significant opportunities for the creative economy, then, but there are also significant barriers – and even some risks. My own belief is that the technology does indeed have disruptive potential – but there is no guarantee that this potential will be realised – and even if it is, adoption may be slower than some predict. It is also far from certain that this transformation will be in the interests of creators and consumers. Arguably, blockchains could usher in a new era of digital rights management in which the problem is not that intellectual property rights are not enforced but, rather, that they are enforced too strictly.

Whether positive or negative, though, we need to think through this potentially transformative impact – seeing blockchains and other distributed ledger technologies as relevant to the creative economy and not simply as a fintech phenomenon.

I conclude with seven brief recommendations for policymakers:

1. Embed blockchain technology in the Industrial Strategy and creative industries ‘sector deal’
2. Establish a cross-sector, cross-departmental blockchain working group
3. Publish clear guidelines on the treatment of cryptocurrencies and tokens
4. Extend the sandbox programme to include tokens and industries beyond fintech
5. Establish blockchain innovation hubs around the UK
6. Invest in the blockchain talent pipeline through schools and universities
7. Take the lead in working towards global, multi-stakeholder blockchain governance

Robert Schwetner, ObjectTech Group Ltd

1. Summary:

This evidence concentrates on the conditions for maximising the positive impact on people.

- We highlight that technology needs to support changes to be sustainable and that unless the UK changes some of the short termist habits in relation to business, the benefits of blockchain will not remain in the UK.
- ObjectTech argues for a cohesive approach building on the success of values led businesses to date.
- Government needs to effectively support the introduction of a new digital infrastructure support infrastructure required.
- Government support and provide regulation to encourage ongoing innovation.
- Government should support ongoing standards and regulation initiatives, as well as exploiting its global position to drive a consensus for harmonised regulation and legislative environments.
- A broad and diverse education approach needs to be aligned to support the disruption.
- The blockchain can be used to create trust frameworks and ultra-personalisation. When combined with being blockchain agnostic and commercially interoperable exploiting these aspects leads to where growth and benefit lies.
- The new ways of working and living, will have a fundamental effect on people. This is especially true as the rise in the sharing economy and the growth in importance of social value, will require a change in the economic models we currently use.
- The ability to be able to trust the identity of counterparts, will remove intermediaries in business, as well as in all walks of life, including philanthropy. The change to a trustable way of interacting will change how we work and interact with each other.

- The ability of the new technologies and the trust they engender, together with ultra-personalisation has the power for many who are excluded or marginalised both socially and financially being able to access social networks (reducing loneliness for example) and tailored financial products reducing poverty globally.

2. ObjectTech:

2.1. The ObjectTech Group is a successful and growing UK company, developing Self-Sovereign Identity platforms. As a launch customer, ObjectTech is delivering gateless immigration and paperless passports, as well as crypto wallets, to Dubai. This will give us 100 million users and make ObjectTech of global significance.

2.2. ObjectTech sees progress in delivering the superior levels of utility and personalisation possible with blockchains. These changes are far more powerful when underpinned by a self-owned and permissioned identity and can run with common parameters such as those being developed as part of the ISO Blockchain Standard. The future is also ensured when there is interoperability between commercial operators and products are developed to run on more than one blockchain. The public does not trust tech monopolies.

2.3. ObjectTech believes that the current paradigm, that value led businesses thrive, as accelerating and so, we as a society both local, national and global, will have to utilise most of the transformative potential and the disruption that blockchain enables. We also need to be clear about the negative effects and work responsibly to mitigate them whilst including all people and all societies in this new transformation and its opportunities.

2.4. ObjectTech is using its design led approach to deliver identity as a product in itself, but also to use the identity platform to transform commercial relations in businesses as diverse as banking, telecoms and the opportunities for global inclusion. ObjectTech realises the value of this position, not only for ultra-personalised service for individuals, but working closely with regulated sectors to realise the benefits of blockchain innovation for reducing compliance procedure and increasing process assurance.

3. Evidence:

3.1. ObjectTech believes that to be a success the blockchain revolution must work for everyone. The purpose of developing blockchains and blockchain products and services is to create socio-economic opportunity leading to a quality of life for everyone around the world. Evidence is given in support of that vision.

3.2. Our position does not simply describe what is the potential or current impact of blockchain on people, whether it be positive or negative, rather we are keen to describe conditions that can maximise the good for the maximum number of people in the UK and globally.

4. Blockchain:

4.1. Blockchain and the applications that can utilise it does not deliver a universal panacea. Blockchain is a very powerful tool but on its own, it cannot provide solutions for economic, social or political issues.

4.2. Any technology and any change that the technology can deliver is more effective and more sustainable, if it supports a political settlement, a social movement or meets economic need. Blockchain alone is not a digital transformation for a company or a society, it can only underpin change; digital or otherwise. Blockchain can make changes simple and allow trust between individuals or organisations but it cannot for example provide a solution to the Northern Irish Border issue, it can only support and enable a political settlement.

4.3. The Blockchain is a powerful tool and from ObjectTech's standpoint it provides two things:

- First it enables a new type of trust framework
- Second it allows for control of the individual and personalisation

4.4. The trust and aligned control it allows is what makes the Blockchain transformative. Without trust via immutability and de-centralisation, the value and utility of the blockchain ceases to exist. This needs to be protected.

4.5. Blockchain will 'power' radically new ways and approaches, in the same way as the internet currently underpins the majority of what we do, covering all aspects of our lives and interactions. How we interact within our communities, with each other, with our employment opportunities and with our government can, should and will change fundamentally.

4.6. It took some twenty years for the internet to become essential to us all. The ability of people, businesses and society to absorb and make use of the significant additional utility that blockchain enables, will be much faster than the internet revolution given that, in general, we are accepting of technology. The counter, the break on progress, is that many people simply do not trust technology and the companies, especially large tech companies, that deliver it to us.

4.7. It is therefore clear that we are not starting with a blank sheet of paper. There is a need to create a balance between corporations current and arrogant permissionless use/abuse of our data and continuing to grow utility. It is also clear that a powerful solution is to ensure that personalised social value is generated around an individual's or a community's use of blockchain based technology. This in turn means that there should be a limit on the size and reach of companies. There must be functioning meaningful competition existing in all markets, as well as interoperability between companies and blockchain agnosticism. This should

ensure that no single or small group of corporations achieve the dominance that currently exists and that and social value is accrued for individuals and communities alike.

5. Commercial Environment:

5.1. The UK commercial environment that blockchain companies exist in is no different to any other business. The UKs' long held short termism does not support the benefits, that blockchain utilising industry can generate, remaining in the UK. So, whilst investment and particularly R&D investment remains low in the UK for all businesses, the likelihood is that many of the benefits that blockchain can deliver to the UK economy will not be realised.

5.2. The same short termism, coupled with a zero-risk perspective of financial institutions in the UK restricts the ability of the UK businesses to raise capital, in the UK. Further ensuring benefits migrates overseas. ObjectTech has direct experience of this. Plus, government support is piece meal and not joined up, it does not build with companies. Again, ObjectTech's experience and those of many other businesses we have talked with support this reality; no matter what government rhetoric is.

6. Governance:

6.1. The initial requirement here must be for digital savvy leadership, to be empowered. The structures required for successful governance are local, regional, national and global and the UK needs to both look inwards to determine where accountability is to lie (and for what) as well as look outwards and support current initiatives and promote new ones, where it has influence. Including the World Bank, which has produced and supported good work in this area, the UN as whole and in the Commonwealth. In short, we will all prosper if the governance of the blockchain follows consensus driven principles and the UK should exploit its position in the world to drive this new consensus.

6.2. For example, the development of ISO Standards. ObjectTech's CEO, Paul Ferris, currently leads the identity working group with the development of the ISO Blockchain standards (TC307). The 'rails', on which the blockchain will run need to be globally accepted and utilised. If they are narrowly defined to short term political or corporate advantage the global aspect of the technology is diminished and it is here that the benefit resides, as does the UK's future.

6.3. The legislative and regulatory environments are important and required to be permissive. They should lag behind the innovative front (allowing innovation to thrive) but promote the positive, push areas for societal well-being and interest, as well as mitigate the effects of the negative consequences of use of blockchain. Otherwise benefit will be lost as companies seek to solely maximise profits. Without such an environment, the agility and disruption possible from smaller businesses will also not be realised and social capital will not

grow in parallel with UK economic benefit. Meanwhile, inequalities will deepen, and the digital divide will widen, with profoundly negative consequences for society as a whole.

6.4. To spread the benefits of blockchain and blockchain applications to existing as well as new businesses and so maintaining employment, companies should be encouraged, via tax and other incentives, to digitise and develop not just their products and services but also their business models to take advantage of what the blockchain can and will offer their industry. There is a clear role for the government in enabling the de-mystification of the technology and its value to business leaders and owners alike.

6.5. It is the opinion of ObjectTech that the UK risks being left behind if it does not proactively create a wisely regulated, business friendly environment that is export focused and capitalises on both the economic and social capital value that blockchain can generate for the UK economy and for its populace.

7. Trust:

7.1. Trust and proven trustability will be at the heart of the ongoing value and utility that the blockchain can deliver.

7.2. Trust is intimately aligned with the public and corporate view of the effectiveness of governance. The governance systems must be seen to work. The individual experiences of users must be positive, when compared to the value users ascribe to the utility they are offered and they extract from blockchain enabled technologies.

7.3. For the majority of people, trust equates to privacy. There is a tension already existing between our knowing our data is misused (from a personal perspective) and the utility or the lack of willingness to change to another provider. Competition has not led to vastly improved consumer experiences across the internet. People see companies as simply maximising profits at the consumers. Utility is the trade-off often proffered to support this position but it is the large companies who dictate general terms and expectations across all industries that leave the consumer, the individual or even the small company powerless. Thus destroying trust.

7.4. By enshrining transparency and meaningful competition as well as promoting small businesses, new technology can change this power balance.

7.5. Also, by directly promoting the ability of technology to offer ultra-personalised experiences for both commercial and social interactions, via the immutability of a blockchain, trust can be grown and future adoption increased.

8. Algorithms

8.1. To most people, the get out clause of ‘the computer says no’, is a red rag to a bull and destroys trust in companies and any (and all) IT systems. Despite this, algorithms are becoming more prevalent in society and offer many advantages particularly when coupled with machine learning.

8.2. Issues also exist around algorithms being based on discriminatory data and hence providing for permanently biased outputs.

8.3. To counter the genuine worry that many people have of algorithm driven technology, there must be an effective mechanism that allows for them to be challenged in real time.

8.4. With the immutability of the blockchain, -garbage in garbage forever- redress needs to be faster, more clearly focused on those disadvantaged and registered widely to stop an error becoming the excepted truth.

8.5. Algorithms need to be able to be policed by national authorities and international bodies and so a responsive ombudsman role needs to set up possibly at all four levels referred to in the Governance section above, namely, local, regional, national and international. This call for some harmony between approaches and an understanding of how a decision in one country might be enacted or have effect in another.

9. Digital Infrastructure:

9.1. Government support will be required to enable the development of infrastructure and hardware. The aim should be to ensure that it is not a limiting factor on development and at scale use of blockchain and blockchain enabled products and services.

9.2. The role out of faster broadband is not a valid example of what to do and how to achieve such an end. For a countrywide endeavour a central control is required. If new ways of working, if local and especially rural economies are to stand any chance of being revitalised then full coverage (both geographically and socially) needs to be ensured.

9.3. Protection of the infrastructure and providing reassurance is a vital aspect of encouraging use of technology and maximising impact on people.

10. Democracy:

10.1. The personalisation that the blockchain allows means that it will be far easier to deliver services to people and serve the population on line.

10.2. Certainly, with a population who has a secure digital identity faster more secure voting is possible allowing for a more engaged population, potentially returning more power to councils or new entities.

10.3. A far more representative form of democracy is therefore possible with a far more engaged population, encompassing the positives and negatives that entails. The same is true of the potential for increase civic activism and its effectiveness.

10.4. The risk will be that a polarised population will become entrenched as we are seeing with social media use. Strategies need to be in place to combat this at all levels of government and civil society.

10.5. Recent revelations about voting processes (domestic and abroad) coupled with big data and AI analytics capabilities show that technology is already having large impact on the democratic system. Blockchain is one tool that can provide transparency and assurance here along with other technologies, however, the UK risks being left behind other more progressive countries if policy and strategy does not reflect these findings.

11. Visibility:

11.1. A role for government and legislatures would be to promote the visibility of blockchain technologies themselves, plus the safety and security of the infrastructure that supports them.

11.2. Additionally, governments should promote technology applications across government functions and use government as a test bed to promote risky pilots and gain acceptance that failure is part of the development processes.

12. Education policies:

12.1. As society changes in response to the increased prevalence of all tech types: big data, AI and the blockchain, the workforce required to service social and economic needs also changes. If the UK is to significantly exploit this change, then the education at all three levels will need to change to respond to the opportunities it presents. However, this should be largely, but not be exclusively, directed towards developing tech skills and the skills required to be able to conceive of and deliver new products. Social changes and the ability to grow social capital will continue to demand a diverse society and so we will still need a diverse workforce with diverse interests and abilities, which means maintaining broad curriculums.

12.2. In addition to formal education, opportunities to develop skills on-line and in the workplace should be reinforced and incentivised. This will retain people within the workforce, pull additional people into the skilled workforce and allow skills to be developed more rapidly and directly in response to needs and employment opportunities.

13. Disruption to work and work patterns:

13.1 This is an area where there is a great deal of fear and suspicion about what the future holds. The realignment of how we interact and how we do business, where employment opportunities lie in the future is likely to be an issue where no government cannot fence sit. A

level of uncertainty is inevitable and for those closer to the bottom of the socio-economic hierarchy increased uncertainty, will be difficult to absorb economically or accept socially. That is, for some it represents a freedom and for others a tyranny, as with the current 'gig' economy and the rise of the working poor. The role and nature of the social safety net will have to be redefined, to enable people to make the most of the new reality, rather than force compliance on an unwilling workforce.

13.2 Further growth of the sharing economy and an increased 'uberisation' of the economy, will be enabled by the blockchain and identity functions changing further how, when and what people 'do' for work. The ability to maintain a standard of living without the quantity of consumption, or potentially the income, as we move more to a rental based interactions, will change fundamentally the motivations people have to work and disrupt fundamentally the economic models we current use, that require continued and everlasting growth.

13.3. For many the blockchain enabled future will enable or require:

- Multiple careers simultaneously,
- Increased flexibility and move to loose networks of people, as opposed to conventional company structures
- Increased distance working and reliance on digital infrastructure
- Reduction of required remuneration
- Increase in perceived value of social capital over economic growth
- Change payment regimes with the potential that cryptocurrencies represent

13.4. The above will require different types of employee engagement and ensuring that workers' rights are extended to this new experience.

14 Removal of Intermediaries:

14.1 As blockchain allows for the introduction of verifiable trust into interactions, that is knowing and being able to trust that the person, or organisation on the other end of transaction is who you think they are, intermediaries in business of all types will or can be removed from transactions.

14.1. This should:

- Increase Efficiency
- Reduce costs for consumers of all types
- Reduce environmental Impact
- Create direct relationships between producer and consumer, or originator and final recipient in banking etc.
- Simplify Supply chains (especially when truly smart contracts are used)
- Improve terms of trade, again reducing costs and certainty, thus reducing risk in business

- Reduce the ability of counterfeit goods entering the supply chain

14.2. Effectively business and to a large extent social interactions, will become more certain, faster and cheaper for all. This when allied to different models of consumption could reduce the costs of living and allow for a redistribution of resources and bring many who are currently excluded into the productive economic sphere.

15. Economic Model:

15.1. The blockchain will allow for the renting out or renting in items to be a viable alternative to outright and exclusive ownership. For example, it seems almost certain that the model of ownership of cars in our society will continue to change. To achieve this, each item needs a trusted identity, which holds information about the item including ownership, value and insurance. ObjectTech's Self-Sovereign Identity platform can do this as we can provide an identity to people, legal entities (companies say) and things as well as processes

15.2. Living standards can be maintained without growing overall consumption or potentially incomes. This could well spell the death nell of the current economic model which calls for continuing and unending growth. Social capital is likely to grow in importance as economic capital declines and as the blockchain can assign a tokenised value to social capital it is likely to become a parallel means of exchange.

16. Philanthropy:

16.1. As the blockchain introduces certainty and hence both transparency and traceability into relationships, as with trade it is possible to link a beneficiary directly with a philanthropist (and with the assurance that each is who they say they are). This can happen at the individual level, for the ordinary citizen as well as for the wealthy and the state. The result will be a change in giving, and with more certainty and a reduction in the costs of maintaining living standards, potentially an increase in charitable giving that bypasses today's charitable institutions.

17. Financial and Social Exclusion:

17.1 Blockchain can be used in multiple enabling contexts to address the lack of access to credit or creditworthiness. This and a reduction in the costs of personalising products will bring more people into the field of being able to access new financial products globally and enable them to reduce costs (in the UK) and become economically active in the UK and overseas.

17.1. ObjectTech has use cases that cover the reduction of loneliness in the rural UK, the reduction of barriers to volunteering in the UK. These both use the blockchain to verify identities and bring trust into relationships.

17.2. ObjectTech believes that the excluded should not have to rely on technology that has been built with part time coders and by companies with ineffective business models.

17.3. A change in commercial governance enabling business models, such as B-Corps to become more prevalent and encouraging the concept of service into commercial and commercially sustainable businesses, will allow the excluded and marginalised to be served far more effectively.

Paul Domjan, Exotix Capital

New technologies are adopted when an innovation is good enough to replace an existing technology or business process.

This means that the impact of new technology can happen faster and be greater in developing economies because the existing technology or process is often weaker. One example is mobile phones, which created at least twice the impact on productivity in developing countries as in developed ones. Going back to the 19th century, railroads provided a far bigger incremental improvement in countries without a pre-existing system of canals.

Railroads improve transportation. Mobile phones improve communication. When railroads arrived, developing countries had weaker systems of transportation than developed countries. When mobile phones arrived, developing countries had weaker systems of communication than developed countries.

Trust is the oil that lubricates the global economy, and it is typically provided by an intermediary. Paper money is backed by the central bank, while the credit cards are issued by an established and trusted network, like Visa or Mastercard. Property ownership of the house is established by a land registry, and incomes is validated by our bank statements or tax records. Transaction can take place using trust in these institutions because the buyer and seller both trust an intermediary rather than one another.

In developing economies, many of these institutions of trust are weak or non-existent.

Additional problems exist with respect to establishing and enforcing contracts. Contracts are essentially a set of pre-agreement responsibilities between two parties and a set of rules for how both to execute these responsibilities and to handle disputes. Contracts are essentially an instrument of trust, but in this case the trust is in the legal system as a trusted third party to ensure execution of the contract. As with other areas of trust, mechanisms for enforcing contracts tend to be weaker in developing economies.

Blockchain is fundamentally a technology about trust. At its essence, blockchain technology provides trust between two parties without the need for any third-party to act as an intermediary. Because developing economies, and especially the smaller frontier markets, have weaker institutions of trust than developed economies, and indeed larger developing

economies, it is much easier for blockchain technology to be good enough to offer an alternative to existing technologies in these markets.

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