BLOCKCHAIN FOR GOVERNMENT

DELIVERING PUBLIC SERVICES

Blockchain applications - regulation, policy & strategy

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1. APPG Blockchain Evidence Meeting on Blockchain for Government.

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 nineteenth Evidence Meeting explores the use of Blockchain for the government in public services. It provides a summary of the takeaways from the Evidence Meeting.

The Video recording of the session is available on our websites:

- APPG Blockchain https://uk.bicpavilion.com/about/appg-blockchain and
- Big Innovation Centre www.biginnovationcentre.com/

Details of the Meeting

- Date 22 June 2021
- Time, 17:30 – 18:30pm BST
- Location, Virtual House of Commons, London
- Participants, 138 attendees

Panellists: Evidence Givers, Chair & Secretariat

The evidence meeting was Chaired by the APPG Blockchain Chair Martin Docherty-Hughes, Member of Parliament. Big Innovation Centre acted as the Secretariat for the APPG on Blockchain, led by CEO Professor Birgitte Andersen and Fernando Santiago-Cajaraville.

The nineteenth APPG on Blockchain Evidence Meeting aimed to inform Members of the House of Commons and House of Lords about the current developments in the use of Blockchain. Building a robust Blockchain ecosystem is part of the APPG Blockchain mission. Assuring representations from across stakeholders, The APPG meeting on digital assets had Evidence Giving from:

- *Policymaker – House of Lords*
- *International Institution – The Organisation for Economic Co-operation and Development (OECD)*
- *Academia – University of Surrey*
- *Blockchain Industry – Capita Consulting*
- *Think Tank - Big Innovation Centre*

Evidence givers

Lord Holmes of Richmond **House of Lords**	**Benjamin Welby** Policy Analyst, Digital Government and Open Data **OECD**	**Sayali Borole** Smart Economy Project Lead **Big Innovation Centre**	**Prof. John Collomosse** Director DECaDE **University of Surrey**	**Dr Tirath Virdee** Director of Artificial Intelligence **Capita Consulting**

Chair	Secretariat	
Martin Docherty-Hughes MP House of Commons, **UK Parliament**	**Secretariat:** Professor Birgitte Andersen CEO **BIG INNOVATION CENTRE**	**Rapporteur** Fernando Santiago-Cajaraville Project Manager, **BIG INNOVATION CENTRE**

2. Background

The meeting's primary goal was to understand Blockchain technology's uses to increase efficiency in delivering public services, benefits, risks, and barriers. The APPG on Blockchain has brought together global perspectives from different institutions, academia, and businesses

The speaker's panel addressed the following questions about the use of Blockchain to deliver public services:

- How can Blockchain support service delivery for national and Local Governments?
- Which is the right infrastructure for governments to build their applications in a cost-effective and interoperable manner?
- What is Data Democratisation, and how it can help the public sector?
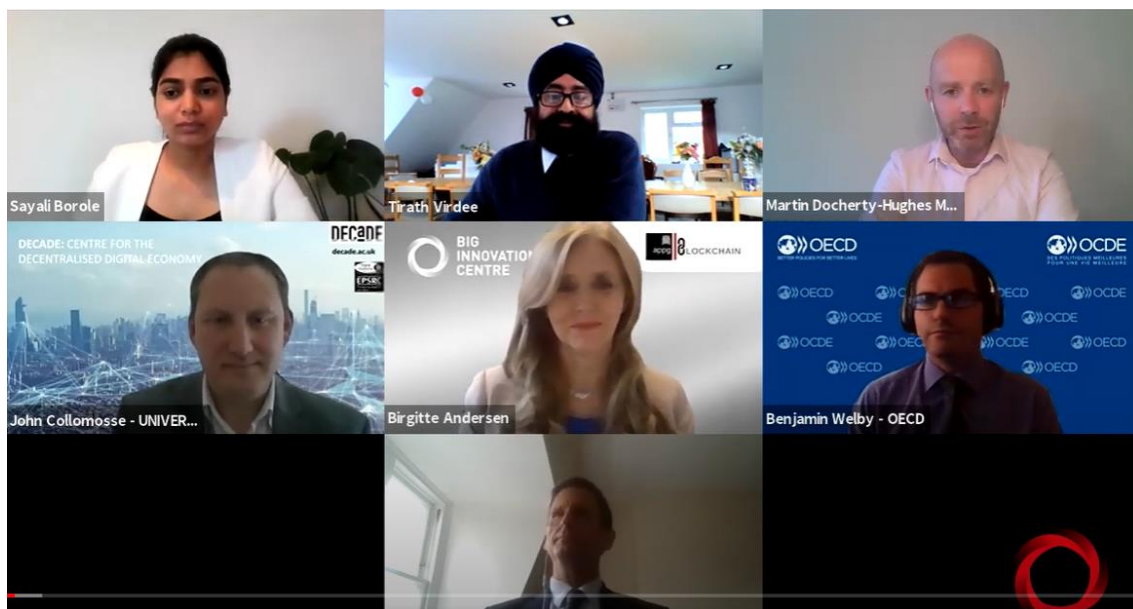
3. Meeting Takeaways

1) Blockchain can be highly beneficial to the public good

Blockchain applications can improve the public services, the service delivery, and a public organisation's capacity to improve them.

The improvement of public services applying Blockchain has been successfully assessed in several pilot projects. At the national level, we can find successful proof of concept within,

- Her Majesty's Revenue and Customs (HRMC) to reduce the friction in the customs control
- Department for Environment, Food and Rural Affairs (DEFRA) to improve the control in the importation of agricultural products
- UK National Archives, to help safeguard the integrity of future sustainability of public archives
- HM Land Registry to facilitate registration and transactions of real estate assets.

Despite Blockchain being discussed heavily theoretically at the local level, it is difficult to find case studies targeting a specific urban governance challenge, especially in the UK. Some of the successful international proofs of concept have focused on,

- Improving the benefits system through smart contracts in the Netherlands
- Improving citizenship engagement implementing Blockchain in the eligibility and verification of voters.

DLT, Blockchain, and other new technologies have the potential to completely reimagine the social contract, the relationship between citizens and the state. (L. Holmes)

Using blockchain instead of a centralised database of fingerprints managed by the national archives is fundamental to the changing basis of public trust. (J. Collomosse)

Broadly recognised benefits of blockchain at the government level include improving efficiency, administrative efficiency, and cost savings. (S. Borole)

Public sector blockchain is certainly providing fertile ground for experimentation (B. Welby)

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2) Blockchain should be included in the Governments Digital Strategies at all levels

Public bodies and local governments need to familiarise themselves with blockchain technology. Unfortunately, there is a knowledge gap between those who know about blockchain, and subsequently, governments who do not.

In the current local government digital strategies, blockchain technology has not even entered into discussions. (S. Borole)

The pace across government around DLT and new technologies are far from where we need it to be. (L. Holmes)

Upskilling of the public services workforce needs to occur if government want a successful widespread introduction. The right environment for using Blockchain technology has to be created by the governments, and public sector leaders should be empowering and create cultures of experimentation. Teams should be operating in an environment that allows them to experiment and change direction if necessary

We would like to see public sector teams treating blockchain as an ordinary part of their toolkit, where it is viable, valuable, and vital, but not under any pressure. (B. Welby)

3) Data is at the centre of everything

Data need to feed blockchain networks; consequently, the right environment for accessing and managing public data has to be created to put data in value.

For this task, national data strategy and data maturity models are crucial. Currently, the public sector holds massive amounts of data. However, most of these data are not able to be used. Data sets need to be parametrised and characterised is a crucial aspect of data democratisation.

The current National Data Strategy proposal (Sept.2020) does not tackle the issues around data democratisation. (T. Virde)

Data democratisation as a term has changed its meaning over the past five years, and now it means no more than making data accessible to anybody that needs it (T. Virde)

However, although everything is about data, blockchain is not designed to store large volumes of data; Blockchain will be used to underwrite the integrity of the data stored elsewhere

Rather than considering blockchain as a data storage solution, it should be considered as a data integrity solution. (J. Collomosse)

4) The pace of experimentation should be accelerated

At the moment, Blockchain is not changing the public sector. Demonstrable, production-ready, high adopted use cases are still exceedingly rare. Blockchain is part of the 4.0 revolution but not being able to keep the pace and this directly impacts the quality of the public services.

The pace across government around DLT and new technologies are far from where we need it to be. (L. Holmes)

But the adoption of new technologies is more than a tech problem. Several non-technological aspects are crucial for a successful Blockchain implementation. For instance, user needs must be the core of the project along with a clear value proposition; a vast amount of thinking has to be invested into understanding the public services and the citizens' needs

Getting the best out of any technology in the public sector is not just about focusing on technology. (B. Welby)

The right ecosystem is crucial for blockchain testing to happen successfully, so public government actors can familiarise themselves with blockchain and have a certain level of understanding of technology. Consequently, creating the right partnership among the public and private vendors is crucial.

If Blockchain technology wants to gain wider acceptance, the adoption process must be well understood (S. Borole).

4. Evidence Giving

4.1.   Lord Holmes of Richmond, Member of the House of Lords

New technologies can be used to solve pernicious problems that have dogged our society for decades

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Meaning that we have been suboptimal to what we could have been as individuals, communities, cities, local, national governments, and a globe. The purpose that these new technologies can be put to unleash potential.

In 2017 we published the *"Distributed Ledger Technologies for Public Good: leadership, collaboration and innovation"* report. It sought to investigate where and how DLT could make a material difference to public service delivery and national finances.

Taking some examples from the horrible year we have had through a COVID perspective, 25,000 doctor days were spent proving credentials and identity when the report was released. As a society, we want doctors to have the skills and qualifications that they say they have. With a DLT solution, those 25,000 doctor days would be converted into care. We also explored the use of DLT in border control, where there is room for a potential DLT solution.

This was the purpose of the report to get proofs of concept in the public sector.

Many differences could be made in the public sector through using Distributed Ledger Technology

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Since the report was published in 2017, we have come far, but what is interesting is how far is still to travel and how much latent potential there is.

The pace across government around DLT and new technologies are far from where we need it to be.

Reducing Friction in International Trade

Another example is Brexit, with the consequences or opportunities in front of us. DLT can be used to reduce friction in international trade. A proof of concept was carried out with the Australian UK wine market. DLT technology was able to get everybody collaborating around a use case. From the grape to the bottle arriving on the table, physical details, agriculture details, vineyard culture details, and customs details, being enabled on a distributed ledger, available in real-time, allowing to see the whole supply chain from the grape, production, and transit to the UK.

Why do this? To prove that we can do things differently and prove that new technologies like DLT should not be shiny technology searching for a solution.

DLT should be brought when we identify pernicious problems, particularly in the public sector.

Concluding Remarks

This technology is not just about national government or big corporates. It has the potential for so many different applications. It is about seizing the opportunity.

The public sector for public service delivery needs to be at the vanguard of DLT

We, the policymakers, need to ensure that every taxpayer's pound is put to best effect, allowing us to unleash all the talents across government, both national and local.

DLT, Blockchain, and other new technologies have the potential to completely reimagine the social contract, the relationship between citizens and the state.

4.2. Benjamin Welby, Policy Analyst, Digital Government and Open Data, OECD

Benjamin Welby
Policy Analyst, Digital Government and Open Data, OECD

The OECD has been looking more specifically at the role of blockchain in the public sector over the last few years.

In 2018, a primer was launched for public servants; it responded to the interest heard about *how blockchain technology fits within government?*. The paper identified over two hundred pilot projects worldwide, making a case for governments to acquire more excellent knowledge about the technology.

In 2019, the OECD worked with senior digital government officials to capture the state of what was happening inside government with blockchain and artificial intelligence. Officials looked at the challenges and opportunities of developing strategies and putting funding in place, encouraging the adoption of such technologies.

Both projects identified many potential use-cases and started to surface questions about whether blockchain was a mainstream solution for the government.

In 2020 we published, *'The uncertain promise of blockchain for government'*. A paper that looked at various case studies to understand what was going on. These case studies had to be examples with high adoption, which had reached a production phase, no longer pilot phases. As well, the report identified what stopped pilots from reaching that level.

'Three V's' Checklist

The starting point was to determine the appropriateness of blockchain for public sector projects. Then, in the OECD Observatory of Public Sector Innovation (OPSI), Colleagues drew on a model that Deloitte coined in 2015. The model is based on the idea of the '3 V's': Viability, Valuable and Vital.
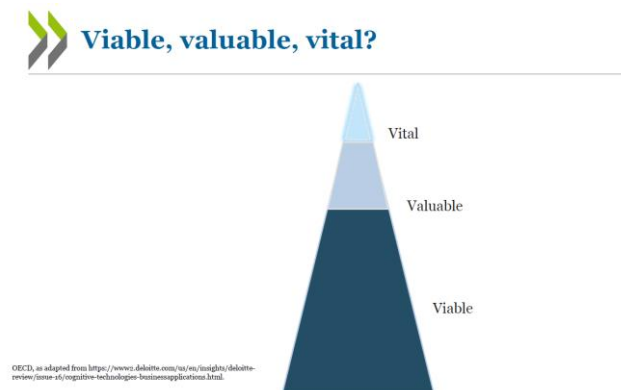
The model offers a checklist for assessing the value of any technology.

Is Blockchain viable? From a technical point of view, can a service be made to work by deploying a distributed ledger solution?

Is Blockchain valuable? Realising the benefits blockchain will offer, does it offer a more significant public outcome than other alternatives?

Is blockchain vital? In terms of meeting this need, does blockchain add something new and special which transforms these challenges? Are there more familiar approaches that would address the need more readily?

Blockchain Myths

The discussion surrounding blockchain is very polarised between advocates and sceptics, leading to many myths floating around.

The paper looked at ten in the paper. Four of them are,

Myth 1: Blockchain is disrupting the public sector around the world. It is not true. Blockchain is not changing the public sector at this moment. Demonstrable, production-ready, high adopted use cases; these are still exceedingly rare.

Myth 2: It is impossible to build successful blockchain applications in the public sector. It is also not true. Public sector teams work on projects that satisfy the '3 V's', adding public value.

Myth 3: if it is blockchain, it has to be significant and disruptive, not a small low-level tool. It is not true. Blockchain can be small and pragmatic, and a splendid example can be found in Estonia. The use of distributed ledgers is an exceedingly small yet integral part of the overall data exchange approach in the country.

Myth 4: The results of projects are contributing to blockchain knowledge. Unfortunately, when we visited some of the pilots in 2018, we found that many had disappeared without a trace. The lessons of why such projects that do not reach the inflexion point are being lost.

We need to find a way of having a more honest appraisal of both positive and negative experiences of Blockchain.

Factors Helping Success

Five things that are crucial for project success,

- **User needs are at the core of the project**, and success continues to be the team's focus, not implementing the technology.
- **A clear value proposition** and a lot of thinking have gone into understanding the public goods derived from this approach.
- **Appropriateness to the level of technology** is followed from the analysis of benefits and an understanding of the needs.
- **Stakeholders need to be engaged across the network** and the domain in which the project is operating. In addition, the nature of DLT means it will have touchpoints in all corners of the public sector.
- **The team should be operating in an environment that allows to experiment** and change direction if necessary. For example, we spoke to a team who had pursued a blockchain solution, yet in the end, success was better found in using a tried and tested non-distributed solution.

Factors Harming Success

On the other hand, we can see elements that make success harder.

- **The more disruptive** is a plan for using blockchain, **the harder it will be** to implement due to its complexity.
- **If a project is not designed to scale** from the outset or with scalability in mind, quite a lot of effort might need to make it work for the whole of society.
- **The legal and regulatory implications** of using emerging technology, like blockchain, can get in the way of teams deploying this service.

Public sector blockchain is certainly providing fertile ground for experimentation

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While the extent to which pilots have matured into mainstream solutions is relatively limited, it is interesting to see what might start to happen through the implementation and maturing of things such as China's blockchain-based services network or the European blockchain services infrastructure.

This underlying technology could see a growth in the extent of those services that use DLT, particularly for crossing borders or multiple actors involved.

Concluding Remarks

Conversations about public sector blockchain rely on the overall maturity of digital government.

The OECD measures the Maturity of Digital Government at the **Digital Government Policy Framework**. In the context of blockchain, it measures three aspects.

Firstly, governments are creating the right environment for using technology and data to meet the needs of society. Second, those strategies are joined up and coherent. Third, public sector leaders are empowering and creating cultures of experimentation. Finally, the public sector teams can operate under their own governance, access the proper funding, and have solid assurances and quality mechanisms that help them do excellent work.

Getting the best out of any technology in the public sector is not just about focusing on technology.

We have to understand users' needs, circumstances, and context and then design the best solutions for meeting those needs, drawing on the most appropriate tools that may or may not include blockchain.

We would like to see public sector teams treating blockchain as an ordinary part of their toolkit, where it is viable, valuable, and vital, but not under any pressure.

4.3.   Sayali Borole, Smart Economy Project Lead, Big Innovation Centre

Introduction

Broadly recognised benefits of blockchain include improving efficiency, administrative efficiency, and cost savings by reducing the need for multi-stakeholders to do and record the same task.

Blockchain for government facilitates services that citizens can enjoy with higher security, fairness, trust, and transparency, especially when interacting with receiving services. For most citizens, the first point of call is the local government or councils, and therefore we researched the relevance of blockchain within this sphere, the local governments. As a result, big Innovation Centre published last year the **Blockchain for Local Government** report [LINK].

Current Challenges

Most of the promised features of blockchain in the public sector can be proved theoretically, yet there is extraordinarily little empirical evidence to support it.

If Blockchain technology wants to gain wider acceptance, the adoption process must be well understood.

Especially in the case of government and local councils, they have to understand the considerations when implementing blockchain, what it means, what kind of partnerships are needed, what sort of stakeholder management goes into it, even if this is for pilot testing to

happen.

Case Studies

Despite being discussed heavily theoretically, with limited empirical evidence, it has been difficult to find case studies targeting a specific urban governance challenge, especially in the UK. As a result, most pilot projects have been carried out in European local governments, including Switzerland, Netherlands, Russia, or Spain.

Use Case	Implementation year + Stage of project	Focused Public service	Primary challenge of local body	Blockchain solution type	Innovation provocation or driving factor
uPort Decentralised Identity	November 2017 Pilot completed	Proof of residency, eVoting, bike, parking payment.	Need of Digital Identity for efficiency	Digital Identity	Digital transformation led by Government
Stadjerspas Smart Vouchers	2016 Production and scaling-up	Providing benefits to low income residents.	Need of efficiency in the system of selection and distribution	Smart contract automation	Inefficient old system that needed an overhaul.
Child Package	2017 Evaluation (post pilot)	Providing benefits to children of low-income household.	Need of efficiency in the old system	Smart Contract	Improved user-experience, decrease fraud. Initiative and leadership of Local Government
Digital Democracy and Data Commons	October 2018 Completed and next steps	Eligibility verification and voting.	Need of verification and anonymity of records	Record keeping, Democracy	Improve government-citizen engagement.
Moscow Active Citizens	2017 Live (being implemented)	Participation and record keeping.	Lack of government accountability and transparency.	Shared database	Improve trust in government.

The table displays the case studies that we investigated, along with the urban governance challenges they were facing.

The research looked at the stage of the project, the type, proof of concept, ongoing pilot, successful pilot, or in production and scaling up. The primary areas to focus on were the user base, the arrangement for stakeholders, and the local and national regulatory environment. Additionally, the relevant public body support, which does make a difference when implementing a blockchain solution.

Overall, blockchain came as an obvious solution for the challenges, except for Switzerland, where they were looking to check the digital identity side of the blockchain. Through all the pilots, local councils and city administrations were looking to improve the services offered, the service delivery and the capacity of an organisation to improve them.

Blockchain is undoubtedly beneficial, but the use cases analysed were all at the pilot level. Once scaled up, things might change, yet it has been improving efficiency so far.

Local Governments

Successfully designing and implementing a blockchain service, local government needs to be mindful of certain aspects,

- Public government actors need to familiarise themselves with a blockchain platform and have a certain level of understanding of technology. This does not need to be thorough, but they need to understand and enhance the upskilling to a certain extent.
- Creating the right partnership and dividing roles and responsibilities among the stakeholders and the partners is vital.
- The right ecosystem is crucial for blockchain testing to happen successfully. This comes from the behaviour, leadership, initiating or encouraging the blockchain experimentation and regulatory environment that supports it.

In the current local government digital strategies, blockchain technology has not even entered discussions.

It is not about proof of concept; it just is not taken into consideration as of now. Therefore, there is a need to share knowledge of what it means to implement blockchain and the use cases they can learn from and reflect on their potential solutions.

Blockchain vendors, such as Iota Foundation, Algorand and blockchain technology partners, believe that the public sector is behind the market developments. The main reason for that is risk aversion with the technology and limited engagement from decision-makers.

Irrespective of discussions happening at the national level, promoting blockchain in ministries like HMRC and the Home Office has not been reflected below, therefore going forward, vendors demand more collaboration and openness from the local councils.

Councils claim that they need more knowledge about the blockchain and how it is implemented,

There is a gap in the understanding of DLT and its implementation. This gap makes blockchain initiatives struggle to break through and establish strong ties with local government.

Recommendations

Future collaboration needs to be based on solid knowledge and exchange.

Robust testing environments are needed. They can be encouraged by the central government; only then can we create the right conditions for testing to happen successfully.

More education, openness, and awareness are needed to understand this technology and its benefits.

Concluding Remarks

There is no exchange happening- everyone is talking independently in isolation.

Recommendations and the gap sound simple, but if we cannot provide the ecosystem and the necessary environment at the local level with national authorities, Blockchain will see something like what AI has experienced where the discussion comes and goes.

We need to build stronger awareness and knowledge exchange, along with the ecosystem around it.

4.4. John Collomosse, Director DECaDE: EPSRC Centre for the Decentralised Digital Economy, University of Surrey.

The Project Archangel

The Project Archangel was a two-year project exploring the fusion of artificial intelligence and blockchain to help safeguard the integrity of future sustainability of public archives. It was a collaboration between the National Archives in the UK, the Open Data Institute, and the University of Surrey.

Blockchain is not inherently a financial technology; it is a general technology.

It is a technology that enables multiple independent parties that do not necessarily trust one another to collaborate to produce and share trusted data. Thus, blockchain enables a decentralised trust model for data.

To give a familiar example, bitcoin is a digital currency enabled by blockchain. Bitcoins are just digital tokens that people can transfer or pay to one another. The job of blockchain is to track in a secure and distributed way who owns which tokens, without any recourse to a centralised authority, like a Central Bank. Instead, multiple independent parties collaborating produce share trusted data.

The Archangel project was unique in leveraging blockchain for a vastly different purpose from

financial use cases. Instead, it was leveraging it for the public good as a way of safeguarding archive data against tampering and restoring trust in the digital record.

It was funded by grants of £500,000 from the UKRI digital economy programme via the EPSRC. This was part of the funding in response to the Government Office for Science report **'Beyond Blockchain'**, which advocated researching blockchain applications beyond the financial sphere. This was echoed by the report on DLT by Lord Holmes, which advocates the use of blockchain for the public good.

Context

Blockchain works as a distributed database; anyone can read or add data to a blockchain, but once added, data is immutable. The idea behind Archangel is to combine this blockchain technology with AI, taking fingerprints of documents as they are received into the archive, which uniquely identifies the content of the record and is immutably stored on this public blockchain. This is done when the document is received into the archive. Then, years later, when the document is released, the fingerprint can be taken off the record and verified against that immutably stored record on the blockchain.

Why do we need Blockchain and AI together to do this? Archives have a curatorial duty to keep content viewable, and with current technologies, the format shift over time. Therefore, traditional cryptographic fingerprinting techniques will not work; we need a visual fingerprint of the record, invariant to change, regardless of benign transformations of the content in the archive. Our solution in Archangel was to train a neural network up to do this and store those AI-derived fingerprints into the blockchain.

> *Using blockchain instead of a centralised database of fingerprints managed by the national archives is fundamental to the changing basis of public trust.*

Historically, an archives word was authoritative, but we now live in an age where people increasingly question institutions and their legitimacy. Archangel is enabling a shift from this institutional underscoring of trust to a technological underscoring of trust. Multiple independent archives collaborate to maintain a blockchain network to underwrite the integrity of their records. Archangel was deployed for trial across the UK national archives and Australia, Norway, Estonia, and NARA (North American archive). The trial lasted two months and spanned around 20,000 records to feasibility test this technology.

Blockchain is useful here because it is open and transparent so that anyone can read it, or in this use, case verifies archival records by fingerprinting those records. The blockchain is also

immutable, so it cannot be changed once the fingerprint is committed into it. It would take more than half the parties colluding to manipulate the data in the blockchain.

We have multiple independent organisations that want to collaborate to create the shared trusted data. It is a design feature of the blockchain that each archive is mutually underwriting the archive of another. Archives across the globe are helping to ensure the integrity of each other's archival data by sharing fingerprints on the blockchain, but without having to share the actual records themselves.

Takeaways

Consensus mechanisms underpin the integrity of data on a blockchain and are a trade-off of different ways to ensure the decentralisation of trust versus energy efficiency and that consensus.

In mainstream blockchains like those that underpin bitcoin or Ethereum rely on energy-hungry mining operations to reach consensus. They are not helpful to the climate emergency, but there are emerging solutions today that fix that. For example, Ethereum is moving to a proof of stake model that is expected to be mainstream within a couple of years.

In Archangel, we chose a consensus scheme of proof of authority for scalability. This enables public readability but only this closed federation of archives, therefore an energy-efficient way to deal with this technology.

Limitations of blockchain. Large volumes of data cannot be stored on it, so it is often better to store data elsewhere, in our case in the archives, but also underwrite the integrity of the data by fingerprinting on hashing that data on the blockchain.

Rather than considering blockchain as a data storage solution, you should consider it a data integrity solution.

Recently Decade, the Surrey University centre for decentralised digital economy, explores Archangels' unique fusion of AI and blockchain technology in new domains such as journalism to fight fake news.

Digital technology, the ease with which we share and modify digital content, has created enormous opportunities, but it has created a risk that has been amplified.

We should find through our archives a solution to tackle misinformation online through some journalistic blockchain, some way of underwriting the authenticity of content using these open and transparent models.

4.5. Tirath Virdee, AI Capability Lead and Director of Artificial Intelligence, Capita

Capita affects the lives of one in three people in the country every day. This is because Capita provides such a vast array of crucial services. All across the country, including national defence, army recruitment, digital policing, provision of social services, congestion charging or assessing people for disability living allowance.

If anybody knows the problems we face around the country with data, we face them at Capita. Both providers and clients have lots of data, but we struggle to make the best use of it.

Dimensions of Data. Capita is increasingly looking at the dimensions of data and technologies that enable us to generate that intelligence from it in a timely manner. We have identified four dimensions to data, issues of trust, issues of cost, issues of relevance and issues of strategy.

Issues of trust. For example, security, privacy, lineage, fairness, legal and ethical frameworks at corporate, national, and international levels.

Issues of cost. In acquiring data from third parties and clients, cleansing and normalising the storage and data stacks.

Issues about relevance, whether the data is complete, its origination, granularity, and taxonomy, for example.

Issues of strategy. Returns on investment, the business value, and monetisation ensure that the data reflect real-world data objects. This is one of the most significant issues because meta-

tagging most of these things, consequently muddying the relationship between the abstract and real objects out there.

Strategy cannot be divorced from the broader issues that every company needs to tackle. Data strategy is crucial, and the data maturity model, where the organisations are in terms of stages of AI maturity or how you are dealing with the ethical and explainability frameworks for AI. These are extremely crucial aspects of trying to parameterise your data.

There are massive amounts of data that are siloed, clogging up today's manufacturing supply distribution user experience

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These silos expose corporations to operational risks of latency, high costs and lower efficiency. Instead, every connected network should be considered, linking users' applications and ecosystems across blockchain networks using multiple trust layers to facilitate interaction and value creation.

Data Democratisation

There are data everywhere, and yet not one "bit" to consume.

What has changed is that in the past, Google was democratising information for billions of devices. Yet now, increasingly, data is being consumed and generated by intelligent systems. There are trillions of those devices, so the way it needs to be curated and catalogued has changed.

The current National Data Strategy proposal (Sept.2020) does not tackle the issues around data democratisation.

The democratisation of data has three aspects,

1) **Parameterising the data** and characterising it. Google does it through crawlers and putting up various parameters, so when we search for it, we can find it. They end up extracting a little bit of value for the data. Data will be generated and consumed by machines, and humans will occasionally come across it because there is intelligence being generated from it. Therefore, the automated, AI-curated parametrisation of data is a crucial aspect of data democratisation.

2) **Decentralisation is a part of data democratisation**, using the virtualisation of blockchain and DLT technologies. This will enable trust.

3) **A consent market-driven monetisation**. When it comes to connecting these assets, two features will accelerate the adoption of data democratisation: digital decentralised identity management and monetisation of data ownership.

What we have been missing in the past few years is the creation of data democratisation platforms.

These are in personal data bots like the Flanders local authority, the Estonian digital government, or AWS data exchange. Any data exchange out there must enable services for cataloguing and exploration—a gateway to explore the interrelationships between data objects.

At the most basic level, metadata, then at the whole level the taxonomy and ontology of the business objects, the data context, the quality, glossary of data, pointers to where the data is coming from. This will enable the ability to create synthetic data for hypothesis generation and proactive action.

The final stage of data democratisation is intelligent data. Data that knows itself tells you what it is, and subsequently, intelligent systems can consume it in a way that makes sense to them.

Whilst these exchange platforms have their weaknesses; they make it easy to subscribe to and use third party data in the cloud.

Data democratisation as a term has changed its meaning over the past five years, and now it means no more than making data accessible to anybody that needs it.

Governments

Once we move on to those data exchanges where we can do data exchange in a way that decentralises data, we come on to the question of what the UK Government can do t*o democratise that data?*

There are examples in other parts of the world where data exchanges are appearing. For example, France has a data exchange within the agricultural community where people share data among them. We also have examples from South Korea, Japan, or Dubai with data exchanges platforms.

However, we are yet to find one in the UK, which we can use meaningfully, where we can use curated data that has been catalogued appropriately. Then AI systems can be through at it and get the data needed.

Concluding Remarks

The government should enable a data exchange that can be used and consumed when needed. Only at that moment it can be complemented with a virtualised layer of decentralisation that enables any blockchain or DLT system to be consumed when required.

No one DLT system will end up ruling the world, and it is a matter of creating a layer on top of that that enables these things to be done.

5. Speaker Bios

Benjamin Welby, Policy Analyst, Digital Government and Open Data, OECD

Benjamin Welby is a Policy Analyst in the OECD's Digital Government and Data Unit. His work currently covers service design and delivery, digital identity, and digital skills in the public sector.

Before joining the OECD, Benjamin was a Lead Product Manager at the UK's Government Digital Service.

Publications,

- "The uncertain promise of blockchain for government", OECD Working Papers on Public Governance [LINK]

Professor John Collomosse, Director DECaDE: EPSRC Centre for the Decentralised Digital Economy, University of Surrey

John Collomosse is a Professor of Computer Vision at the Centre for Vision Speech and Signal Processing (CVSSP), one of the UK's largest academic research groups for Artificial Intelligence.

He directs DECaDE – Centre for the Decentralised Digital Economy, a multi-disciplinary research centre exploring emerging tech such as AI and Blockchain and its impact on the digital economy.

He led the project ARCHANGEL, a decentralised platform for ensuring the long-term integrity of digital documents stored within public archives.

John has spent periods in commercial R&D, working for Adobe, IBM, Vodafone, and HP. John is a member of the Strategic Advisory Team for the UKRI/EPSRC ICT and UKRI Digital Economy Programme.

Publications,

- "ARCHANGEL: Trusted Archives of Digital Public Documents" [LINK]
- "TAPESTRY: A Decentralised Service for Trusted Interaction Online" [LINK]
- "Tamper-proofing Video with Hierarchical Attention Autoencoder Hashing on Blockchain" [LINK]

Sayali Borole, Smart Economy Project Lead, Big Innovation Centre

Sayali Borole is a development professional focusing on using frontier technologies for sustainable development and improving urban governance by building government capacity.

As a Smart Economy project lead at Big Innovation Centre, Sayali leads the Cities committee of Blockchain for Government Council, exploring the role of Blockchain and the status of pilot projects in building the capacity of the local governments in the UK.

Publications,

- "Blockchain for Local Government: The Potential, Case Studies and Perspectives" [LINK]

Christopher Holmes, Lord Holmes of Richmond, House of Lords

Lord Holmes is a passionate advocate for the potential of technology and the opportunities presented by the 4th Industrial Revolution. His interest and expertise are heavily focused on understanding how new technologies can serve us all. In Parliament, Lord Holmes serves as the Vice-Chair on both the All-Party Parliamentary Group on Artificial Intelligence (APPG AI) and the All-Party Parliamentary Group on Blockchain on Blockchain (APPG Blockchain). He was a member of the Lords' Select Committee on Artificial Intelligence and has been a member of Committees on Digital Skills, Social Mobility and Financial Exclusion.

Lord Holmes of Richmond is also Britain's most successful Paralympic swimmer winning a total of 9 golds, 5 silvers and 1 bronze. He was also Director of Paralympic Integration, responsible for the organisation of the 2012 Paralympic Games in London.

In November 2017, Lord Holmes published a report that calls on the government to explore how Distributed Ledger Technologies (DLT) can be used for the public good, updated in October 2018. Recently he has published a report on how DLT can reduce the friction in International Trade.

Publications,

- "Distributed-Ledger-Technologies-for-Public-Good_leadership-collaboration-and-innovation" [LINK]
- "Tech: The Opportunity or Carpe DLT" [LINK]
- "DLT-for-Public-Good-Progress-Update-October-2018" [LINK]
- "Reducing Friction in International Trade" [LINK]

Dr Tirath Virdee, AI Capability Lead and Director of Artificial Intelligence, Capita Consulting

Tirath Virdee is the Director of Artificial Intelligence at Capita. He is involved in researching, applying, and writing about AI, Blockchain, Quantum Computing and Cybersecurity.

Tirath is the founder of Xenesis, sits on the Advisory Board of the Parliamentary Groups on AI and Blockchain, and an advisor to the Scottish Government on AI Strategy. He was the Director of Advanced Technology Group at Siemens AG, a physicist for UK Atomic Energy Authority's Breeder Reactor Programme, and a PhD in Engineering Mathematics.

Publications,

- "Human To Hybrid: The Next Workforce Frontier" [LINK]
- "AI and Blockchain in Human Resources" [LINK]

6. Contact details

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