EU Blockchain Observatory and Forum

An initiative of the European Commission

EU BLOCKCHAIN OBSERVATORY & FORUM

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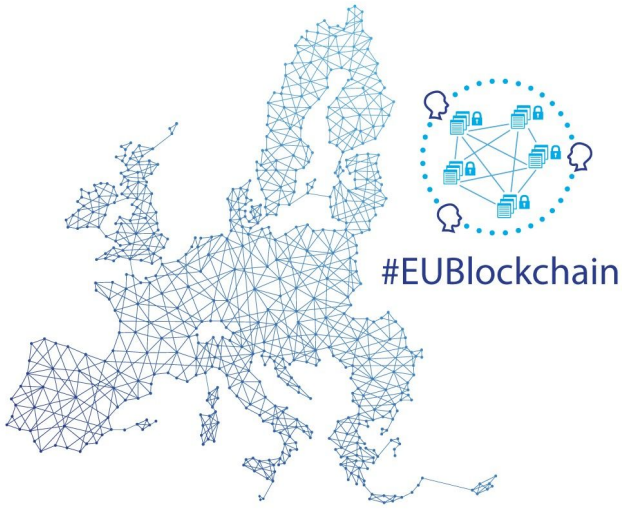

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Introduction and overview of European context and activities

Pêteris Zilgalvis (DG CONNECT)

- The EU Blockchain Observatory and Forum is an essential part of the EU's blockchain strategy, part of an overall vision for blockchain. That vision contains many other elements.
- For instance, 27 member states, Norway and Liechtenstein are working together to build up the European Blockchain Services Infrastructure (EBSI). EBSI is starting with four use cases, and will add three new ones this year. The current use cases are:
    - European Self-sovereign identity (SSI)
    - Trusted Data Sharing (regulatory reporting cross-border)
    - Notarisation (Audit documentation and certification)
    - Diplomas (Letting citizens manage their educational credentials)
- EBSI also helps the Commission "learn by doing" as it allows it to better understand the issues around blockchain. This helps inform among other things several of the blockchain-related regulatory initiatives.
- INATBA is a public/private partnership designed to bring the Member States of Europe together with the private sector as well as other stakeholders like academia to further the blockchain ecosystem in Europe.
- Europe is also investing in research, innovation and startups through a number of initiatives
    - **Startup EU.** Startup EU works with deep tech and focuses on blockchain startups as well as the ability of blockchain startups to converge with other technologies.
    - **Digital Single Market.** Promoting and enabling blockchain as part of the Digital Single Market legal framework. The public consultation on digital assets, which was just closed, is an example of this. Europe is very much looking to enable tokenisation via smart contracts.
    - **Digital Services Act.** The EC is looking at the Digital Services Act, which focuses on e-commerce, to see if there is anything that can be done to support the mutual recognition of smart contracts and avoid fragmentation of smart contract regulation between Member States.
    - **Standards.** The EC cooperates with bodies like ISO, CEN/CENELEC and ETSI on interoperable standards.
    - **Skills and education.** There are initiatives focused on skills development coming to ensure the high level skills that are needed are available.
    - **Funding.** Recognising that Europe has long lagged behind other regions in the availability of venture capital, the Commission also created an AI/Blockchain

Investment Fund so that public money can help make up some of this gap by investing in up-and-coming startups-

- The EC will soon be publishing its **Blockchain Strategy**. This is a policy vision from the Commission on how to take blockchain further under the next budget.
- The EU **Data Strategy** underlines the possibility of using decentralised technologies like blockchain to support self determination by citizens for managing their own data.
- Also relevant is a **Standardisation Strategy** coming out this year looking at the standardisation of emerging technologies like blockchain.

Speech by Eva Kaili (MEP, European Parliament)

Eva Kaili (MEP, European Parliament)
Speech transcript as provided by the office of Eva Kaili

Thank you for having me here in the concluding workshop of the EU Blockchain Observatory and Forum.

Let me start with a brief comment coming from my experience from the previous years.
The attempt of the Parliament and the Commission, to create a framework of work around blockchain technology was mostly an issue of political entrepreneurship. We had to create demand for action around blockchain in rigid and difficult organizations like the EU Institutions, especially in a moment when blockchain was considered as equivalent to bitcoin and ICOs fever, bringing very negative connotations in the mind of conservative policy makers and legislators.

It was the attempt of my team in the European Parliament and the team of Peteris Zilgalvis in the Commission to widen the understanding of the uses and the value of blockchain beyond bitcoin. We wanted to stress to politicians and policy executives that though blockchain is a breakthrough technology for payments and entrepreneurial finance, it is also a disruptive tool in the areas of energy, supply chains, international trade, data ownership, digital identity, copyrights, patenting, healthcare.

The European Blockchain Observatory was instrumental to this effort. The observatory brought together 2.100 members to work on the potential of this technology under the coordination of Consensys, the role of which in these early stage was critical for the success and as Chair of STOA I am thankful for the Consensys' contribution.

The Observatory worked tirelessly on the setting a framework and approach. The studies it produced were strong statements of the proof of value in very crucial policy areas linking blockchain with data privacy, Identity, legal services, the public sector and supply chains. It also

made advances regarding the cryptoassets, the scalability problems of the technology and the convergence of blockchain with AI and IoT.

In terms of influence, again the numbers speak of themselves: 25.000 downloads of these studies and over 300.000 visits to the Observatory's site. Most importantly though, the Observatory gave to us a trustful point of reference when we were in need for significant technical input.

And look where we are standing now! Blockchain is ubiquitous in the markets and public sectors. It is an integral part of any innovation ecosystem and significant regulatory initiatives from the EU are on their way in the coming months, in the interface between the Digital Single Market and Capital Markets Union. We are also much more mature about what this wonderful technology can do, when, and how. This allows us to overcome scalability problems, affecting for example the efficiency of smart contracts. It allows us also to test the efficiency of fundamental concepts such as the "disintermediation principle", and its significant limitations in large scale projects.

We also have significant empirical data of what kind of protocols and blockchain design architectures can work in practice and what protocols and architectures can cause delays, confusion and unsatisfactory results. In one line: we now have a clear understanding of what consists a "blockchain based solution" and we also know that when a solution cannot be delivered on time, with a reasonable number of code lines, and with a reasonable number of developers, then there is something wrong in the blockchain solution building.

With the conclusion of the work of this Observatory we conclude our period of childhood and we getting into an era of adulthood. What means "adulthood" in blockchain terms? It means that we have a clear understanding that Blockchain is all about governance and a clear view of Key Performance Indicators. In this concluding session, I want to speak about the future of Blockchain in Europe or the blockchain in the era of its early adulthood.

If Europe is to have a strong and decisive role in the development of blockchain solutions – and the emphasis is on the solutions instead of "blockchain ideological preferences", needs to have a convincing approach when it comes to optimal governance structures and clear Key Performance Indicators.

European Commission should work systematically on these aspects leveraging the practical knowledge of the ecosystem that underpins our EU Blockchain Observatory and Forum in the coming years. Having clear KPIs is the first step! Once they are in place we need to move forward to the second step.

The second step is to link this European blockchain ecosystem with the major blockchain initiatives and use-cases the Commission runs by itself or in coordination with the Member States. Since the beginning of the new mandate I joined the Budget Committee of the European

Parliament and now I can see the remarkable inefficiencies of this legacy system of innovation funding we have in the EU. We need new tools to assess the quality of results of our funding. I strongly believe that new types of funding that augment ecosystems and crowdsourcing contributions are of paramount importance.

Decentralization is an innovative way of thinking that needs to transcend our governance understanding horizontally. Many brains working in a solution are better than one. This reality should be reflected in the budgetary policy of the EU when it comes to the funding of technology transfer.

If decentralization matters, as the blockchain community rightfully believes, then lets build a technology ecosystem around the blockchain use cases the Commission prepares right now along with the Member States. But why decentralization matters in practical terms? Decentralization is not a new blockchain concept! It is as old as democracy; as old as the idea of diversification of risk.

Look where we are standing now! European Union runs its blockchain solutions with high ambition and high energy. This is consistent with the mandate we in the European Parliament gave to the Commission when we instructed it to make EU the best place in the world to do blockchain. The European Commission responded immediately under the leadership of Peteris Zilgalvis, with all these wonderful activities on Identity, Taxation, Notarization and Diplomas verification.

Now even more advanced solutions are on the way and on top of everything it is the European Blockchain Services Infrastructure, the EBSI. But how it works? Leaving aside the fact that Member States build happily their own nodes, the rest of the burden is concentrated on the shoulders of the Commission, mainly the DG Digit. And this burden is associated with the financial risk, the operational risk, the technological risk, the implementation risk, the time-delays risk and, in case of failure of the current architecture design of EBSI, also a reputation risk. This is why I advocate for a strong blockchain ecosystem. In order to disperse and mitigate the concentration risks we now have accepted. The new EU Blockchain Observatory should reflect on potential solutions to these governance problems. The European Commission should respond to these solutions and come to the Parliament with a plan.

As chair of the Committee of Science and Technology, I work from the very beginning with Peteris Zilgalvis and his team on a vision: To make the blockchain the success story that will give to the EU courage and energy to attain global leadership in the Digital Era. This vision is reflected in this Observatory that now has its concluding workshop, in INATBA which enters in a more dynamic period with Marc Taverner in the role of the CEO, and of course the strategic work of Peteris around the blockchain use-cases, old and new ones, as well as the EBSI. I want success in every level and from my side I will provide the help of the European Parliament to make sure that we will have a significant result that we will be proud of as Europeans.

I have some recommendation to make with the eyes to the future:

First, I advocate in favor of the unity and against the fragmentation of the European blockchain ecosystem. I suggest the creation of a mechanism that will link the new EU Blockchain Observatory with INATBA and most importantly with the Commission's use cases and the EBSI.

Second, I suggest EBSI to be represented in the new Observatory and INATBA in a way that the Member States will be able to take the collective wisdom of the European blockchain ecosystem and compare it with the proposed architectures, their efficiency, their operational feasibility and costs.

Third, I believe that we need a distinct Directorate on Blockchain in the DG CNECT, hopefully under the experienced leadership of Peteris and with enough manpower and budget, with the responsibility to coordinate horizontally all the blockchain activities of the Commission along with the link of these activities with the European blockchain ecosystem in search for cutting edge but pragmatic solutions that are going to be delivered without unreasonable delays, with maximum efficiency and the minimum of concentration risk.

Four, I will work with both the Commission and the Court of Auditors in the re-evaluation and re-assessment of the current KPIs – wherever they exist - that determine what results should be considered as satisfactory when we are talking about technology intensive projects.

My last word is for all those 2,100 people, boys and girls, developers and enthusiasts, who worked hard in the last years in this Observatory, contributing with their knowledge, their experience, their enthusiasm and their dedication to the European blockchain initiative. Thank you all for your contribution. I hope to meet you all in future and better times and I want to promise you, that from my side in the European Parliament I will be always in your support. I predict that the European Blockchain cause will be as strong as the strength of its blockchain ecosystem. Your role in the future, more than what we are doing in the EU, will be the one that will determine the success of this endeavor.

Thank you!

Presentation: Blockchain technology now and tomorrow, technology advancements and adoption

Tom Lyons (Report Manager, EU Blockchain Observatory and Forum)

- The next presentation provided a look at where we are with blockchain in Europe through a review and updates on the Observatory's thematic work as well as a review of some blockchain industry metrics specially prepared for the workshop.

- The Observatory's thematic analyses have been carried out primarily through its reports on its workshops, Academic Research Papers prepared by the Observatory's Academic Partners, and through the Observatory's Thematic Reports (original Observatory white papers).
- To do its work, the Observatory has relied on various thought leaders and community members. These include:
    - **Working Groups:** The Observatory has two Working Groups 1) **Policy and Framework Conditions**, and 2) **Use Cases and Transition Scenarios**, each with 30 members. Members were chosen at the beginning of the project via a public call.
    - **Academic Partners.** The Observatory's Academic Partners are responsible for preparing Academic Research Papers for the Observatory on selected themes- Academic Partners also took part in some of the workshops. The Academic Partners are:
        - University of Southampton
        - Knowledge Media Institution of the Open University
        - Lucerne University of Applied Sciences and Arts
    - **Workshop Attendees.** All workshops featured expert/practitioner presenters and panelists as well as group discussion with all workshop participants. Input from all participants was used in the reports.
    - **Community.** The wider community contributed to the Observatory's work through the Blockchain Map as well as the Online Forum.
    - **Observatory Secretariat.** The Secretariat comprises the DG CONNECT team as well as the ConsenSys team that manages the Observatory.
- The Observatory examined 18 themes over the course of its first two years. These were:
    - **Blockchain Innovation in Europe** (Workshop, Thematic Report)
    - **Blockchain and the GDPR** (Workshop, Academic Paper, Thematic Report)
    - **Blockchain and Government Services** (Workshop, Academic Paper, Thematic Report)
    - **Scalability, Interoperability, Sustainability of Blockchains** (Workshop, Academic Paper, Thematic Report)
    - **e-Identity** (Workshop, Thematic Report)
    - **Legal Recognition of Blockchains and Smart Contracts** (Workshop, Academic Paper, Thematic Report)
    - **Blockchain and Supply Chain** (Workshop, Thematic Report)
    - **Convergence of Blockchain with AI and IoT** (Workshop, Academic Paper, Thematic Report)
    - **Blockchain Governance and Organisational Challenges** (Workshop, Thematic Report)
    - **Digital Assets** (Workshop, Academic Paper, Thematic Report)
    - **Blockchain and Healthcare** (Workshop, Thematic Report)
    - **Blockchain and Financial Services** (Workshop)
    - **Cyber Security and Blockchain** (Workshop, Academic Paper, Thematic Report)

- **Blockchain and Education** (Workshop, Academic Paper, Thematic Report)
- **Social Impact** (Workshop)
- **Research Priorities in Blockchain** (Workshop)
- **Energy & Sustainability** (Workshop, Academic Paper)
- **Conclusion** (Workshop, Thematic Report)

Qualitative Highlights of the Observatory's Thematic Work

- Many of the Observatory's themes have proven highly relevant in the policy discussion. To illustrate the point, the presenter provided some highlights from the Observatory's thematic work that are directly related to policy activities or are still relevant to the overall blockchain discussion today. These include:
- **Initial priorities for blockchain innovation.** Many priorities identified by the Observatory in its first white paper on Blockchain Innovation in Europe (July 2018) are being acted upon. These included:
  - **Clarify the legal and regulatory framework.** As indicated in the opening remarks of Peteris Zilgalvis, the EU is actively looking at the Digital Single Market legal framework in light of blockchain, for instance through the public consultation on digital assets. It is also looking at issues around mutual recognition of smart contracts as part of a review of the Digital Services Act.
  - **Educate Stakeholders.** One express goal of EBSI is to give the EC and Member States an opportunity to educate themselves on blockchain by using it.
  - **Work on standards for decentralised identity/SSI:** EBSI has identified Self Sovereign Identity as one of its original four use cases, and is working to implement a generic Self-Sovereign Identity capability that allows users to create and control their own identity across borders without relying on centralised authorities.
  - **Support blockchain skills/best practice training:** The EC is working on several initiatives to foster blockchain skills development.
  - **Support blockchain research and startups:** The EU funds blockchain research among other things through Horizon 2020. The EC also has an AI/Blockchain Investment Fund to invest in startups and early stage blockchain ventures.
  - **Support public/private flagship projects.** The EC has supported the creation of INATBA, a public/private partnership focused on dialogue between policy makers and the blockchain community in Europe and globally.
- **GDPR**. In its GDPR paper, written in mid 2018 at a time of concerns about the potential friction between blockchain and the GDPR, the Observatory the two are not incompatible. There is no such thing as a GDPR-compliant blockchain, only compliant or non-compliant use cases. This seems to have become a generally accepted view. The GDPR paper was the first Observatory work to address new generation privacy preserving technologies, like Zero Knowledge Proofs, that have since become an extremely important topic for the blockchain community.

- In its **Government Services** report, published in November 2018, the Observatory advocated for a European government services blockchain infrastructure, and today we have EBSI working on a similar concept.
- In its **Legal Recognition of Blockchains and Smart Contracts** report, published in September 2019, the Observatory said among other things that the EU needed to clarify the legal standing of blockchain registries as well as a number of issues around both smart contracts acting as legal agreements and smart contracts with legal implications (like tokens). This is being addressed among other things through the review of the Digital Services Act. In this report, the Observatory also pointed out that there are often tensions between new technologies and the law, but that the two have historically always found each other. This seems to be happening with blockchain too.
- The Observatory's thematic report on **e-Identity**, published in April 2019, advocated for Europe to support self-sovereign identity (SSI) and a role for governments as issuers of verifiable credentials. This is precisely what EBSI is doing in its SSI use case.
- The Observatory's **Supply Chain** paper, published in December 2019, suggested among other things that government agencies, like customs and excise, should consider blockchain to streamline customs and cross-border transport procedures. This too is being addressed in an EBSI use case.
- In its work on **Education**, which included a community-wide skills survey, the Observatory advocated for more investment in blockchain education. As mentioned, the EC is working on a number of initiatives in this area.
- In its **Digital Assets** paper, published in February 2020, the Observatory also advocated for a clarification of the legal and regulatory treatment of blockchain-based tokens. The EC has said it expressly intends to enable tokenisation.

Quantitative Look at the Blockchain Ecosystem

- The second part of the presentation focused on the current state of the blockchain ecosystem in Europe and globally via market research prepared by the Observatory in cooperation with the blockchain-based market research firm Blockdata. Among the findings:
- **Project creation has dropped while more companies seem to be joining consortia**. Since its height in 2017 during the ICO boom, which saw over 1,000 blockchain projects created, creation of blockchain-focused projects has dropped considerably around the globe. At the same time, we are seeing more and more companies joining blockchain consortia. This seems to indicate both a post-blockchain hype consolidation in the market, which was not unexpected, as well as an interest in companies to start to put the technology to practical use.
- **Funding through token sales and venture capital has peaked.** There has been a similar drop-off in capital raising by blockchain projects, reflecting the decrease in the number of projects.
- **Financial services dominate blockchain use cases.** In terms of use case focus, both Europe and the rest of the world are generally aligned, with the lion's share of use cases

focused on finance, either in capital markets or financial infrastructure. All regions are also focused on DLT technology. Despite overall alignment, the data does indicate that the areas of Identity & Reputation as well as Energy and LegalTech are more prevalent in Europe, while Data & Analytics and Enterprise Blockchain seem more prevalent in the rest of the world.

- **Smart contract ecosystem is growing steadily.** There are many metrics outside of project creation and funding that are encouraging and show that the ecosystem is growing and maturing. For example, there has been a steady and significant rise in the number of smart contract deployments since 2017, with Ethereum by far the most popular smart contract platform at the moment. That said, 80% of the transactions carried out via Ethereum smart contracts are accounted for by 0.05% of the contracts deployed.

Look Ahead

- The presentation ended with the following predictions for what's next for blockchain in Europe:
- The ecosystem will continue to consolidate and mature, above all with more and larger consortia and more projects and platforms going live.
- Government services powered by the European Blockchain Services Infrastructure will provide a boost to adoption overall as citizens using these blockchain-based services become acquainted with decentralised applications.
- There will be significant movement in decentralised identity in Europe driven by EBSI and regulation.
- Digital assets will continue to increase in importance. While the first movers in digital assets were tied to the ecosystem (cryptocurrencies, ICOs), we are now seeing more institutions getting involved. Should central bank digital currencies (CBDCs) begin to come online, this will further catalyse the uptake of digital assets and support the overall blockchain ecosystem by facilitating payments
- The Observatory expects increasing clarity and harmonisation on the blockchain legal and regulatory front in Europe. As of today, almost every Member State has published at least an opinion on digital assets. With the EU Digital Assets consultation, the upcoming eIDAS consultation, the aforementioned review of the Digital Services Act, and other initiatives, policy makers are already deeply involved in this work.

Supply chain and trade finance, Observatory recommendations and flagship projects

Marina Niforos (EU Observatory Expert Member); Pablo Valles (ConsenSys), Ludovic Courcelas (moderator)

Introduction by the Observatory

- There has been increasing demand to improve supply chain and trade finance systems with blockchain, whether to help combat fraud, prove quality and provenance and/or manage complexity. In trade finance blockchain is seen as a tool to digitize and streamline today's often manual and costly processes.
- Important industries for blockchain and supply chain: pharmaceuticals, food traceability, raw materials, industry, retail, luxury goods and ocean shipping. That said, blockchain can be employed in almost any use case involving track and trace.
- There are a number of challenges facing blockchain in supply chain.
    - **Legal recognition:** Clarifying the legal effects and validity of smart contracts and transactions in a supply chain context.
    - **Regulator onboarding:** Allowing regulators to be part of blockchain-based supply chain platforms to give them a more transparent view on activities to combat counterfeiting
    - **Standardisation:** Developing supply-chain specific standards both for blockchain components and industry specific components.
    - **Cooperation and governance:** Developing best practice and knowledge sharing when it comes to creating and managing industry consortia.
    - **Core technology:** scalability, interoperability, privacy, integration with IoT

Discussion of challenges

- A lot of the issues in blockchain for supply chain we were discussing before the pandemic. The crisis has however highlighted how fragile global supply chains are. The initial global reaction to COVID has been to simply shut supply chains down for fear of contagion and due to lack of transparency. This has brought into relief how quickly we need to move on some of these technologies because there are real problems to solve. That may bring some momentum to practically advance.
- Looking at the technical, regulatory and governance challenges, the governance ones are probably the most important. These are not related to the rhythm of the advance in technology. They are related to difficult issues around getting a very diverse stable of stakeholders to sit around a table and agree on how to do business in a collective setting.
- The paradox of blockchain is that it can facilitate trust, but to get to that trust you need ex ante some kind of multidisciplinary process for how to collaborate. This is not easy. Supply chains are industry agnostic. They cover a wide number of sectors, geographies and regimes. Yet there is great potential too, and progress has been made. There is an increasing amount of business process information around which we can reengineer, but we have to do it faster.
- In terms of the technology, one major challenge is to integrate the new platform to legacy or external systems.

- It is hard to achieve a great deal of collaboration when you are not used to working together. Consortia members must set up the best governance model at the start. This includes creating the most appropriate legal entity. Members also need to be aligned from scratch on project scope, and this too can be difficult as members may have different priorities.
- We talk about interoperability a lot. To ensure interoperability, it is very important to anticipate what is coming. The only way to do that is to adopt common standards, for example around smart contracts or open source protocols. The current proliferation of consortia – we have more than 20 in trade finance for instance – is good, but we have to beware of the danger of fragmentation of protocols across consortia.
- Many companies are joining multiple consortia, perhaps to test different technologies and see what makes sense. That said, it is in the interest of regulators and the industry to see some sort of convergence and so get economies of scale. So the question is how to balance the individual interests of participants with the collective interests of the industry. We could use more research into such questions.

Where do we stand with blockchain for supply chain and trade finance?

- While many of these consortia and projects were created in 2017 and 2018, it is still too early to say whether they have delivered on their promises or not. The horizon is too short. If you believe blockchain has a potential to be a foundational technology, you also have to understand that it will require at least 10-15 years to reach maturity, and will go through many permutations.
- That said, even in this short period, we have seen a lot of progress, for example in trade finance. Not just consortia being formed but actually going to market and delivering services. We.Trade is a good example of this, which started with four banks and now is 12 and is extending the scope of its services. Or Lloyds Registry having collaborated with a live blockchain to create Maritime Labs. That started with just a certification process and now includes insurance, worker credentials, and other services.
- ConsenSys has experience in this as well having worked on several projects. For example in supply chain and logistics the Aura platform, which was begun by LVMH and is now operated by a consortium, manages digital certificates pertaining to physical products. Today Aura makes it possible for brands to control distribution networks to fight counterfeits and foster trusted client relationships. This has many tangible benefits for consumers. They can for instance access product history and use the ownership and authenticity certificates to help sell their products in secondary markets. ConsenSys also worked on trade finance use cases with Komgo and Covantis. Komgo is a consortium in trade finance in which letters of credit are digitised to reduce the process time and cost. After two years Komgo platform users can reduce the duration of the process from 10 days to one. Covantis is also a trade finance consortium looking to replace inefficient and outdated post-trade processes with more modern ones using blockchain.

- The Aura example demonstrates an attempt to create new business models with blockchain, while Komgo and Covantis are more about increasing efficiencies on the B2B side.
- A specific hurdle when launching a blockchain consortium has to do with compliance, specifically registering the consortium. Obviously the consortium needs to be compliant with all international regulations. But the filing processes can be quite complex and difficult to finalise. One way governments could help facilitate the launch of blockchain consortia is to streamline these registration processes.

Digital assets, Observatory recommendations and implementations around the globe

Valerie Szczepanik (SEC); Matthieu Saint Olive (ConsenSys); Ludovic Courcelas (moderator)

Introduction by the Observatory

- The EU Observatory has written that leveraging digital assets can provide a wide array of benefits. These include:
    - **Reduce clearing & settlement time:** International payments cleared, settled and disbursed in ~5-10 seconds, with transparency and certainty
    - **Reduce infrastructure cost:** Low cost, minimal integration with existing core banking systems by connecting through web services without compromising security levels
    - **Simplified management of rights:** Exercise of voting rights, as well as other new innovative rights previously not offered
    - **Allow development of new applications:** Reduced time and complexity, leveraging smart contracts
    - **Single version of the truth:** Enable asset provenance and full transaction history in a single shared database
    - **Cryptographically secure:** Adds a layer of security with no single point of failure or attack and creates transactions that are fraud resistant
- Some examples of digital assets include: Equity Token, Infrastructure Access Token, Derivative Token, Application Access Token, Fund Token, Voting Token, Ownership Token, Loyalty Token, Payment Token, Reputation Token, Wholesale CBDC, Traceability Token, Stablecoin. Retail CBDC
- Most classifications agree on three basic types of assets: utility token, security token, payment token. Many digital assets are however hybrid in nature, which adds difficulty to the classification.

Biggest challenge in recent years is classification. What is the legal and regulatory landscape and do we still need clarification?

- When it comes to classifying digital assets a lot depends on what the rights and expectations of the parties to a transaction are. The threshold issue with the SEC is always analysing whether a digital asset is a security or used in a securities-related activity.
- The US has different statutes for this question of what is a security. This has been defined through decades of case law and is a very broad concept involving looking at economic realities of a transaction to decide if it is a security. This is known as the Howey Test. It looks at whether there has been an investment into a pool with an expectation that others will undertake managerial and/or entrepreneurial efforts to increase the value of that investment.
- The concept is simple. Applying it in practice is harder. The problem with digital assets and blockchain ecosystems is that they are complex. It is not the technology but also all the aspects around it. Questions include: what is the core protocol, the consensus mechanisms, who are the participants, who are the promoters, what are the promises and expectations?
- We dont give much weight to the marketing terms, whether it calls itself a stable coin, a utility token, etc. We want to get to the background of what it is actually going on in the ecosystem or with the transaction. Many so-called stable coins are not necessarily coins and are not always stable.
- Stable coins purport to provide some price stability compared to another asset. There are different types. Can be linked to a pool of assets or pegged or employ an algorithmic stability mechanism looking at supply and demand. Important to note there are different aspects of this ecosystem. There is the front end interface where people use the coin. There is the back end focused on how the coin is working and being kept stable and who is in charge of that. Then there are the governance aspects around who is managing changes to the ecosystem, who are the participants in the ecosystem, who decideds changes to the protocol, the composition of the basket, and so on. These can raise issues not just in securities law but other areas as well, like AML and countering terrorist financing. So we have a lot of different features and functions in this one word stable coin.
- SEC regulates digital assets the way it regulates any other asset. The approach is technology neutral, looking at conduct and activity. If the asset is a security the agency will apply existing securities laws. If it is not a security but is being used in connection with a security, then it will regulate the securities-related conduct according to its rules.
- The US has very broad-based and principles-based regulations. The anti-fraud are very broad and are interpreted that way by the courts. The SEC has brought a number of cases in the digital assets arena alleging fraud. In the time around 2017 many people were taking advantage of the hype around digital assets and distributed ledger technology to prey on those who were excited by this new technology. The SEC wants to

make the technology safe for good projects. The guide rails for protecting investors have been in place for a long time.

The CBDC topic has accelerated. What is motivating central banks and what are most advanced central bank initiatives?

- The CBDC topic is very prevalent in the blockchain ecosystem at the moment. But to be clear, a CBDC does not imply blockchain. The concept is technology agnostic.
- A CBDC is defined as a new form of central bank money that is not collateralised but rather represents a claim on the central bank. According to the BIS some 70% of central banks are considering CBDC. And while in the beginning central banks' experimentation with blockchain for CBDC were focused on wholesale CBDC, meaning for high-value transactions for interbank settlement, now most are also considering retail CBDC as well, which are for low value, day-to-day transactions and represent a digital version of cash.
- Today the most advanced initiatives which are already in the experimentation phase and could go live by 2020 are mostly retail. These include projects in Sweden, China, Cambodia, the Bahamas and the Eastern Caribbean.
- While these projects all share some common objectives, it is interesting to look at Sweden and China, which have some different specificities. Sweden is the least cash-dependent country in the world. The country has experienced a significant reduction in cash usage to the point where in Sweden some merchants even refuse cash. Banknotes represent less than 1% of GDP, compared to 11% in the Eurozone as a whole. The Swedish central bank’s mission to ensure financial stability is made harder by the fact that most of the population has no access to central bank money. The main objective of their project is to ensure that citizens have access to secure and risk-free central bank money.
- In China it is completely different. According to public statements the government wants to project its monetary sovereignty but probably it really wants to promote the internationalisation of the renminbi and compete with the dollar. By lowering the cost to use the renminbi China will encourage other countries to use it, particularly those with weak currencies.
- Last but not least there is the elephant in the room which is Libra, Facebook's stable coin project. It is important to say that libra is not a CBDC. It is a global stable coin that could however reach two billion people from day one and so it will compete with central bank money. Libra is currently applying with the Swiss regulator for a payment system license.
- There is no doubt that the Libra white paper increased awareness of the topic and has been a great catalyst for central banks to experiment with CBDC. Now we have to see if central banks decide to provide an alternative to Libra and other private payment solutions or if they let the private sector increase their control of the money and payment infrastructure.
- There are many non-technical questions and challenges central banks have to consider before implementing a CBDC. One is to assess and mitigate the impact on the legacy

financial system. If people convert the money they have in commercial banks to CBDC that will reduce the assets of commercial banks and with their capacity to issue loans and to finance the economy. Such an influx would also dramatically increase the liability side of banks' balance sheets, meaning banks would would have to increase their holdings on the asset side, and we would see a growing demand for low risk assets like government bonds.

- But while there are risks in implementing CBDC, there are also risks in not implementing one, as we see with Libra or the digital yuan. If these projects go live the room for action by central banks will be much lower than if they issue their own CBDC now with a mitigation plan attached to it.
- There are also a lot of design considerations in creating a CBDC, and here not all central banks have the same view. For example, should central banks distribute CBDC directly to citizens or should they use a two-tier distribution model involving commercial banks? How can they strike the right balance between privacy and traceability. Or should the CBDC bear interest.
- When central banks have clarified their mitigation plan and design challenges then the technical challenges will emerge as a result. A CBDC has to be reliable and resilient but also fast, efficient and secure for end users, but also innovative and open to competition.
- In terms of timelines, we should see CBDCs within a year. In China the government has launched pilots in four cities with companies like McDonalds and Starbucks. CBDCs are in live experimentation in the Caribbean and Cambodia. We can be confident that by the end of 2020 there will be live CBDC in the world.
- There is a lot of work being done to look at the benefits but also the challenges and risks around so-called global stable coins. The FSB for instance just published a paper on stablecoins[1] and has invited comments from the community. All are recommended to have a look.
- While some may ask why we need CBDC in Europe where we already have instant payments, there are reasons. One would be that access to central bank money in a digital way would foster digital innovation and lower the barrier to entry of Fintech companies to provide services to end users, for instance to have interest saving accounts, something that is already offered by AliPay in China but is not available here in Europe.

Digital identity, Observatory recommendations and state of adoption

Masanori Kusunoki (CIO Government of Japan); Daniel Du Seuil (EBSI); Ludovic Courcelars (moderator).

[1] Addressing the regulatory, supervisory and oversight challenges raised by "global stablecoin" arrangements: Consultative document, Financial Stability Board, 14 April 2020.

Introduction by the Observatory

- Blockchain-based digital identity is a major component of the next generation Internet.
- This is important, because today, identities are created and managed by third parties, leading to:
    - Fragmented user experience
    - Difficulties verifying nformation from counterparties
    - Insecure storage
    - Weak link between digital and “offline” identities
- We now have usable, universally accepted standards to solve these issues
    - **Decentralized identifiers (DID).** A DID is a scheme with several attributes that uniquely defines a person, object, or organization. DIDs are fully under the control of the DID subject, independent from any centralised registry, identity provider, or certificate authority.
    - **Verifiable credentials.** A credential includes information about the subject, the issuing authority, and metadata such as expiry time. A verifiable credential is a set of claims and meta data that are tamper-evident and that cryptographically prove who issued it.
- The Observatory has made four recommendations to accelerate development of the decentralised identity ecosystem:
    - **Support the role of government as an issuer of verifiable credentials.** By educating and encouraging government agencies on decentralised identity and their role as issuers The potential benefits for citizens and companies are huge, both in terms of saving costs and speeding up processes.
    - **Clarify the relation of blockchains to eIDAS.** To enable blockchain-based trust services recognized up to the highest level of assurance under eIDAS.
    - **Clarify open issues around decentralised identity and the GDPR.** Clarifying the degree to which certain kinds of obfuscation methods might take data (such as DIDs, revocation registries, keys…) outside the scope of GDPR
    - **Support the broad use of digital identity in cities.** The EU could support local authorities via funding and expertise to build city-wide infrastructures for their residents.

Discussion of decentralised identity in Japan and in Europe with EBSI

- In Japan digital identity is quite advanced. The government is an identity provider already both for individuals and legal entities. It is developing some decentralised identity technologies as well. Government agencies have hosted an industry hackathon focused on graduate and work history certificates and the government has supported a trial of eKYC on blockchain in the regulatory sandbox.
- EBSI is building a blockchain infrastructure based on nodes hosted by Member States. One core component that has been identified is the need for an identity framework not just for the infrastructure but also that provides the ability to add decentralised identity to

many processes. While there is a lot of interest in Member States and public and private entities in general, it has become clear that the most interesting cases for new identity approaches are in cross-border situations. EBSI tries to implement and accelerate a cross-border interoperability layer that can be used in many use cases to facilitate interactions so that Member States do not have to build their own SSI framework but have one ready to use on the European level.

- EBSI is building core components but also invests in developing technical specifications so that governments can easily implement them in the ecosystem. The list the Observatory showed before [see digital identity recommendations above] is very much aligned with what EBSI is doing. It is also trying to involve more governments and Member States in those SSI ecosystems and also see how that can be related to the existing trust framework. EBSI does not want SSI to be just about self-declared information but something trustworthy that can be used in interactions with banks and government agencies. Here eIDAS has something powerful, and so EBSI is trying to combine these aspects. EBSI has built a first version that will be released in the coming days, and hopes in the next few months to build a second version that is more pilot-ready.
- In terms of regulatory framework, EBSI published a study on the link between SSI and eIDAS.[2] According to the study there are a lot of solutions that could be implemented now. While perhaps not always in an ideal fashion, there are ways you can start to add some trust elements from state-issued identities to the EBSI SSI system. So there is cause for optimism. One the one hand SSI and blockchain rely on technologies and things like e-signatures that are highly stable and can be used to provide trust; on the other SSI is an opportunity for eIDAS to grow in a cross border and cross sector interactions context.
- Japan has been issuing smart-card based identity credentials since 2015. Currently about 20% of its citizens have that kind of a smart card. The government also provides a trusted attribute source for citizens. The government is an identity provider not just for citizens but also for corporates. While this works well, the government believes it has to improve user experience. The plan to do that over the next five years. Also right now the process is not bidirectional; it is only government to business or government to citizen. The plan is to make it bidirectional and interactive between the government, citizens and the private sector.
- The digital identity ecosystem is heavily dependent on network effects, yet there is no real incentive for actors in the ecosystem to be first movers. So there is a chicken and egg problem as SSI is only useful if large numbers of people can use it in multiple sectors. So you really need someone to move first and make that investment. This is where the government could play an important role. In most European countries an extremely important component of core identity is a state-validated or supported identity. It is not the only one, but it's important because so many attributes, like diplomas for example, are linked to it. If governments can promote such a system and have private

[2] See About SSI eIDAS Bridge.

entities use it then the ecosystem can be reinforced and grow. For example, if a bank can use digital credentials issued by a government in an interaction then there is a business case for the bank to develop that capability internally. So the government can be a facilitator here by helping achieve more stable specifications and a more stable identity environment. Nobody wants to invest in things that are not stable, not specified and not interoperable.

- When it comes to standards, EBSI does not want to invent something specific to Europe. So EBSI is closely following the development of emerging global standards like those coming from the W3C. EBSI is also interacting with the ecosystem and other stakeholders, for example the INATBA working group on identity.
- EBSI will be launching version one and publishing the technical specifications. It is also launching a user community so that people, not just Member States but the private sector, can see what is happening and what kind of services EBSI delivers. In the next stages EBSI will be launching pilots to see how it can be used by its Member States and their partners. Right now the focus is public services but in future EBSI will be evolving into something that will be interacting with the private sector. A lot of information on EBSI and how to join the community is available on its website.[3]

Blockchain in a Changing World

Marc Taverner (INATBA); Alex Cahana (ConsenSys Health)

- The next session featured presentations by INATBA and ConsenSys Health on the topic of blockchain in a changing world, with a focus on how blockchain can help in the fight against COVID.

INATBA Presentation

- INATBA currently has 15 working groups featuring about 800 contributors. It has also put together an INATBA COVID Task Force.
- COVID has caused some changes in the world. For one, digital has become the new normal. People are getting used to hanging out with their friends virtually. Travel and industrial activity is down and some studies are showing 40% reductions in certain harmful pollutants compared with the same period a year ago. The acceptance of digital has now reached into traditional settings it had not reached before. We have for example seen governments around the world adapt legislation to allow Annual General Meetings to be held digitally, to include e-voting, and to allow documents to be sent digitally. That is positive from a blockchain perspective. The fact that governments are having to adopt digital ways of working is also causing large tranches of the population to look at these technologies too. Also our relationship with cash is being challenged, for instance in the

[3] https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/EBSI

US, which has been a bit behind in digital payments and now is seeing over 50% of the population switching to some digital form of payments.

- There are a number of opportunities and challenges for blockchain here. Perhaps blockchain can help create trust and support trade with people in a world where digital is more predominant but there is no easy way to identify counterparties using traditional means. While we have seen vast advancements in many apps that track people's movements and provide data that can help control the spread of the virus and perhaps help find a vaccine, we have to balance that against the respect for the privacy and identity of the individual, and perhaps blockchain can play a role here too. Blockchain could potentially be used to help counter the increase in cyber attacks we have been seeing. With the drop in industrial activity, trade and travel causing reductions in pollution, perhaps we can use this opportunity for a green reboot, and employ blockchain to help nudge the needle slightly by helping people adapt to new ways of digital working.
- In times like these it is ever more important that we develop appropriate policies at speed, but those policies need to be strong and take into account the public and private sector views.
- The INATBA COVID Task Force is made up of three groups of industry participants:
    - **Government** participants who present the challenges they face in the pandemic as well as their business-as-usual considerations on how to adopt blockchain and DLT.
    - **Industry** participants who can provide solutions on their own or through collaborations with peers in industry.
    - **Academic** participants who help INATBA identify and analyse with good academic rigor and neutrality the problems the governments are facing and who can evaluate the potential solutions.
- On 12 May there will be the first of a series of digital events. In it the Canadian government will share insights around their challenges in COVID and how they think certain aspects of technology, with a focus on blockchain and DLT, could be leveraged to address these. There will be other such events over the next 6-12 weeks.
- The INATBA COVID Task Force has been initially focusing on use cases in supply chain and donations. So far 25 solutions have been presented to the organisation. Six were around helping to bring the business community together for collective action against COVID. Seven were around how to protect people's livelihood and facilitate business continuity during the crisis. And 12 were aimed at mobilizing cooperation and business support for the COVID-19 response.
- Supply chain examples include a digital identity solution that was presented to one government organisation that could help citizens in different countries stay informed about the development of vaccines, as well as a cross-silo, cross-protocol and cross-industry solution that allows for the track and trace of products along the medical goods and medical protective equipment supply chain.

- On the donations side, INATBA has looked at a number of solutions designed to give confidence to donors that their contributions are going to recognises legal entities and that allows them to track the use of their donations.

Presentation ConsenSys Health

- In the post-COVID world more people are paying attention to blockchain and DLT, and thinking maybe there is something going on there. That said, a lot of people have been missing the point of what blockchain can do to create a more resilient system in healthcare. We have talked about how it can improve the medical supply chain, be a matching engine for resources, for data sharing, and similar challenges. But blockchain and DLT can also help us augment our resilience, both in terms of capacity to survive when there are severe shortages of basics like food and water, and our capability to recover quickly from such shocks.
- Many people are concerned by the fact that large governments, given the choice between mass testing and mass surveillance, are opting for mass surveillance. This is not only a question of privacy. It is also about understanding that, from a healthcare perspective, you are your actions. When someone takes those actions that are captured by data and use it and abuse it and sell it without your consent, they are taking a piece of your dignity. So in this context blockchain can be seen as a dignity-preserving technology.
- Blockchain can support multilateral collaboration through computational trust, through transparency and by helping to decrease costs and add efficiencies to processes. ConsenSys Health is focusing on this through developing a rapid pandemic response platform with large federal partners. The intent is to create a platform that uses not just blockchain but also privacy-preserving technologies and federated learning techniques, because crowd intelligence is really the only way to fight against a global biological threat.
- Borrowing from Deloitte, we can think in terms of four possible outcome pattenrs:
    - One pattern is **"passing storm"** – there will be some type of effective healthcare and political response and fiscal and monetary stimulus might help but will not reverse the economic losses.
    - The "good company" – as governments drown in the burden of their responsibilities and struggle to provide assistance we witness a surge in public/private partnerships. This sees the strengthening of large platforms like social media, and not only reinforces stakeholder capitalism but also repeats the moral hazard of too big to fail.
    - The **"sunrise in the east"** – where Asian countries manage the crisis better than countries in the West but at the cost of a strong centralised response, which then becomes the gold standard.
    - The **"lone wolves"** – scenarios where governments focus on restrictions on foreigners and restrictions on global trade while emphasising local security, and

as a result government surveillance and biometric surveillance becomes more prevalent.

- When we think about using blockchain as a response to COVID, we should remind ourselves that tracking struff, tracking transactions and tracking people are not the same thing.

Discussion highlights

- The general public and mainstream healthcare industry is still not familiar with SSI, which is why we have not seen much movement in the direction of self-sovereign electronic health records. The idea of owning your own health data is unfortunately still not a concept for most people and governments. In the US, there is only one state out of 50 in which the individual owns his or her health data. In all the other states it is owned by the entity that created the record. In effect that means that the vast majority of healthcare data in the US is owned by five large companies. That makes for privacy, security, censorship and collusion risks.
- There are also no incentives for people to think about the wealth that can accrue through health data. Today when thinking about blockchain for health we tend to look at it from an operational perspective; how to improve the current system. That is fine. But there is more that is possible. If we can tokenise our data and also view our health data as an asset then that can serve as an incentive to healthy behavior. Health data is like money in the sense that it is valuable, that you want to keep it under your control and safe, that you want to grow its value by investing in it, etc. Today we don't see data as a universal right, and yet it should be seen so.

Conclusion: A two year journey: the Observatory and Forum by the numbers and practical feedback

Ludovic Courcelars (Project Manager, EU Blockchain Observatory and Forum)

- The workshop concluded with a look at the Observatory's achievements over its first two years.
- History and goals. The EU Blockchain Observatory & Forum was a 2 year initiative launched in Feb 2018. Its goals were to:
    - **Create a Knowledge Repository** about blockchain technology and blockchain initiatives around the world, including education materials
    - **Identify Framework Conditions** suitable to accelerate blockchain innovation across the European Union in the context of a Digital Single Market
    - **Prioritise Use Cases**, especially high-impact blockchain initiatives to be initiated by the European Union and Member States.

- **Achievements by the numbers**[4]
    - 13 thematic reports
        - 9 thematic reports published to date, with over 25,000 downloads
        - 4 more thematic reports in final stages of preparation to be released by end of May
    - European **Blockchain Map** featuring over 700 initiatives
    - Observatory **Website** with 91,000 visitors and 310,000 page views
    - Active **Twitter** account with 9,500 followers and 800+ tweets
    - **Online Forum** With 2,200 members
    - Monthly **Newsletter** with over 2,600 subscribers
    - Workshop and events videos on YouTube channel with 8,500+ views
- Why is the work of the Observatory important for Europe?
    - It aids Europe in crafting and shaping regulation to help accelerate the development of the technology and the industry
    - It helps identify actionable use cases to receive support as needed
    - It contributes to building a better global understanding of the technology among all stakeholders, advancing research and education
    - It helps ensure that European citizens and businesses benefit from the promise of the technology

Appendix

Workshop slides

- EU Blockchain Observatory and Forum Conclusion Workshop - Main Deck
- Blockchain in Europe – Now and Tomorrow
- INATBA presentation

Workshop videos

- Videos from this and all other workshops can be found on the EU Observatory website under reports.
- Videos specific to this workshop:
    - Conclusion Workshop video

Official agenda

[4] All information available at www.eublockhcainforum.eu.

Time	Activity
13:00	*Videoconference can be joined - Technical tests*
13:30	**Introduction and overview of European context and activities -** Pêteris Zilgalvis (DG CONNECT)
13:40	**Speech by Eva Kaili** (MEP, European Parliament)
14:00	**Presentation: Blockchain technology now and tomorrow, technology advancements and adoption (EU Blockchain Observatory and Forum)**
14:20	**Supply chain and trade finance, Observatory recommendations and flagship projects -** Marina Niforos (EU Observatory Expert Member); Pablo Valles (ConsenSys)
14:50	**Digital assets, Observatory recommendations and implementations around the globe -** Valerie Szczepanik (SEC); Matthieu Saint Olive (ConsenSys)
15:20	**Digital identity, Observatory recommendations and state of adoption -** Masanori Kusunoki (CIO Government of Japan); Daniel Du Seuil (EBSI)
15:50	**Blockchain in a Changing World -** Marc Taverner (INATBA); Alex Cahana (ConsenSys Health)
16:20	**Conclusion: A two year journey: the Observatory and Forum by the numbers and practical feedback (EU Blockchain Observatory and Forum)**
16:45	**End of the day**