Thematic Webinar Report

Global Forum Thematic Webinar I - 2023

Wednesday, February 15th, 2023

Blockchain & Impact of Digital for Cities

Participants (50):

Arsalan Abtati, Helene Abrand, Sylvie Albert, Namir Anani, Ingrid Andersson, Anixi Antonakoudi, Sherif Aziz, Youssef Berbash, Jean Berbineau, Jean-Pierre Bienaimé, China Blue, Marek Canecky, Wojciech Cellary, Don Davidson, Olivier Duroyon, Luca Fayoux, Guido Ferilli, Genevieve Fieux-Castagnet, Nicholas Flack , Alexandre Hedjazi, Dionysia Kallinikou, Nitya Karmakar, Hugo Kerschot, Eun-Ju Kim (from ITU), Constantinos Kritiotis, Latif Ladid, Lucy Lombardi - TIM, Thomas Mackenzie, Jeremy Millard, Eikazu Niwano, Hélder Pereira, Alice Pezard, Ramy Rabenja, Judith Ryser, Philipe Scheimann, Jon Shamah, Alan Shark, Olga Shlykova, Johan Stronkhorst, Susanne Siebald, Baïla Sow, Yoshio Tanaka, Lynn Thiesmeyer, Daniele Tumietto, Sylviane Toporkoff, Cid Torquato, Daniel Van Lerberghe, Owen Vaughan, Paul Wormeli, Sarah Zhao.

The Global Forum Thematic Webinar #1 2023 on Blockchain & Impact of Digital for Cities took place on February 15th, 2023 from 13:30 to 15:00 CET via Zoom. It was the first webinar of this year's Global Forum webinar series.

With 50 participants joining from all over the world, it was a well-attended, particularly dynamic and highly interactive webinar with lively discussions.

This report sums up the discussions of the Global Forum Thematic Webinar I/2023

Programme

Welcome and Introduction

Topic 1 – 45 min

Blockchain: How is it transforming our daily life?

Moderator: Latif Ladid

Blockchain Technology – Dr. Owen Vaughan, Director of Research, nChain, United Kingdom

Blockchain Policies – Prof Namir Anani, President & CEO, ICTC, Ottawa, Canada

Use Case: Food Supply Chain – Latif Ladid, Founder & President, IPv6 Forum; co-Chair, IEEE Blockchain Initiative, Luxembourg

Panel discussion

Topic 2 – 45 min

Cities: The evolving challenges for urban and rural cities

Moderator: Sylvie Albert

Introduction of Panel Members and Announcement on a New Research Book on City Sustainability – Dr Sylvie Albert, Professor, Department of Business & Administration, University of Winnipeg, Canada

New Localism: Impact of Increased Decentralisation and Devolution to Cities and Regions – Jeremy Millard, Managing Director, Third Millennium Governance, Denmark

The Impact of Digitalization on Cities – Prof. Namir Anani, President & CEO, ICTC, Canada

Nurturing Urban Eco-Systems to Fight Climate Change and Support Local Economies – Daniel van Lerberghe, Director & Co-founder, INNOGAGE Ltd., Belgium

LOCARD: Use of Blockchain in Criminal Justice (Chain of Custody) – Hugo Kerschot, Founder & Managing Director Is-Practice, Belgium

Welcome and Introduction

Ingrid Andersson, moderating, together with Sylviane Toporkoff, welcomed the participants to this first webinar of the Global Forum webinar series 2023.

Blockchain: How is it transforming our daily life?

The topic's moderator, **Latif Ladid**, Founder & President, IPv6 Forum; co-Chair, IEEE Blockchain Initiative, Luxembourg, set the scene with some introductory remarks.

Owen Vaughan, Director of Research at nChain, United Kingdom, provided an introduction to Blockchain Technology.

In 2008, Bitcoin came with a native token (bitcoin) and a self-sustaining economic model. It also introduced programmable money. Transactions are easily customizable and gathered together in the so-called ledger. Transactions and ledger are fixed in an append-only distributed database (blockchain). The database is public and unencrypted. Anyone is free to browse the blockchain. The cryptography used is public-key cryptography. People can see that a transaction has been created, but they don't see the associated identity.

A typical blockchain transaction has a list of inputs and a list of outputs. One can think of the inputs as payments to a certain address in the outputs. The outputs contain the conditions for which this payment can be stand onwards. It contains a code predicate and the included data. A predicate takes as an input a variable and checks whether it gives a valid output or not. It typically performs a signature check: if the correct signature is given, the payment can be spent. Different blockchains have their own code formats (e.g. Bitcoin uses Bitcoin script, Ethereum uses Solidity). Bitcoin is designed to allow 4GB data packets (same as IPv6).

There are two types of accounting models in blockchain: the Unspent Transaction Output (UTXO) model, which is used by Bitcoin, and the account-based transaction model, which is used by Ethereum. In the UTXO model, every UTXO (transaction outpoint) is consumed entirely in each transaction, and each one is independent from every other one (similar to banknotes). The UTXO model uses different public keys in every transaction to maximise privacy. The account-based model is similar to a bank account: each user has a balance that can increase or decrease. Here, the order of the transactions matters significantly and places some limitations.

A blockchain ledger is a collection of transactions. Distinguished from the blockchain, it is analogous to an accounting ledger: A list of transactions, with inputs and outputs, and everything has to match in order to have integrity. The transactions of a ledger are gathered together into blocks. Block production times may be shorter in more modern blockchains, but this doesn't matter from the perspective of the ledger.

Bitcoin miners are characterised by the ability to gather together transactions into a block, produce a valid block and obtain a reward. The are incentivised to be as connected as possible to other miners to get aware of the lasted block as soon as possible. When Bitcoin was launched, the reward for each block in the chain mined was 50 bitcoins. This block subsidy reduces by half every four years and the miners on the network receive less and less money.

It is therefore important to have real world adoption with high transaction volume, so that the network becomes economically viable long-term. In this case, the miners reward could be a combination of subsidy and transaction fees.

Namir Anani, President & CEO of ICTC, Ottawa, Canada, addressed the merits of blockchain, blockchain applications and associated policy aspects.

The construct of global economy is primarily based on a set of contracts, transactions, and records that govern our economic, legal, and political systems. They protect assets, establish, and verify identities and document sequences of events. They govern interactions among nations, businesses, communities, and individuals. Blockchain has in recent years, emerged as the foundational technology offering solutions to improve business value chains, enhance efficiencies, enable a system of trust based on consensus, while unlocking further economic activities without the need for a trusted third-party intermediary. This technology is additionally shaping the third generation of web services referred to as Web 3 or the "Internet of Value" while unlocking new economic prospects.

Blockchain provides distributed trust and carries out transactions much faster than the actual system of trade without the need of intermediaries. Blockchain has seen tremendous adaption during the last years. The global blockchain technology market size is expected to grow at a CAGR (compound annual growth rate) of about 87% by 2030. Blockchain is expected to reach approximately 1.6 trillion dollars technology capabilities around the world by 2030. International world trade is estimated to represent a 28 trillion-dollar economy, including supply chains, track and trace of the products and trade financing. Some of the trade transactions can take between 30-120 days to settle. The savings created with blockchain applications making this happen instantaneously are extremely high.

Advanced manufacturing industries need to know the providence of their material or if there is any bogus material that has been inserted. Manufacturing industries spend about 20-25% of the supply chain checking their equipment bevor installing it, especially in critical sectors such as aerospace. Blockchains are faster, immutable and ensure traceability.

Blockchain adoption has also been quite remarkable in the context of digital identities, the health and food sector and the financial system. Another important aspect is the Token Economy with its many new capabilities. Adoption has been at such a high level that Cisco and the WEF estimate that approximately 10% of the world GDP will be leveraged on blockchain by 2027.

Even if a lot of regulations and policy dimensions have been created recently, the regulations are very much focused on crypto and the DeFi (decentralized financing). There is very limited regulation on blockchain technology capabilities. There are so many different blockchains and we need to have a better interoperability and standards in the future. Other questions to be addressed in the future are the compliance of blockchain and the GDPR, the security of the blockchain, but also how blockchains operate and their energy consumption.

Latif Ladid, Founder & President, IPv6 Forum; co-Chair, IEEE Blockchain Initiative, Luxembourg presented findings of a large EU project addressing the use case "food supply chain".

According to latest IBM data, 30% of the food is wasted in the chain. There are inefficiencies and errors because everything is still manual, such as the inventory tracking and tracing. There is no single source of truth across suppliers and there is a lot of abuse, counterfeit and substitute products.

By 2050 in the US, we have to produce twice more food. Farmers have to produce more with fewer resources, while population and consumption growth is driving the demand up. Competition increased and profits go down in the food supply chain. Consumers are asking for transparency and trust (94% of the consumers would be more loyal to a brand that offers complete transparency and 63% are willing to pay more for products that are transparent sourced and responsible made).

The goal of the Cities2030 project is to future proof an effective cities and regions food system (CRFS) via a connected structure centered in the citizen, built on trust, with partners encompassing the entire CRFS system. Blockchain creates unprecedented supply chain visibility because of its unique set of properties. A blockchain-based solution seems to be best suitable to combine of transparency, traceability, efficiency and trust.

The following steps have been set up within a pilot introducing blockchain for a local food supply chain: Local producers receive a digital identity and enter the data about their production to the application. They also prepare the delivery docs (digital) and deliver the product directly to the store. The store accepts the product from the producers by scanning a QR code from their mobile phone. The data are directly transferred to store business management system. A declaration for the product is prepared by the store and placed next to the packaging so that customers can trace the origin by scanning the QR code.

Q&A

Referring to the development of the blockchain, **Owen Vaughan** underlined that one has to distinguish between the capitalisation, ragged up in the tokens, and the capacity of the ledger itself. The interesting aspects to observe are the adoption of blockchain, how the blockchains scale in the coming years and whether one of those will outcompete the others. Having just one blockchain is much more efficient. The key for getting adoption is scale. Sometimes, this means scarifying some functionality, but a blockchain upscale is the best for everyone and we might not need all fancy new features.

Namir Anani added that blockchain is becoming a critical component for managing intellectual property, copy rights and trademark aspects, and even digital identity.

Owen Vaughan confirmed that blockchain is safe from quantum computing. 1. The Bitcoin consensus process only relies on hash functions, which are resistant to quantum computing attacks. So, consensus is safe. 2. The only other cryptographic primitive in Bitcoin is an ECDSA signature. So, we just need to replace this with a quantum resistant signature scheme. These already exist, for example lattice signature schemes – but they require a large amount of data.

Owen Vaughan agreed that blockchain is best used as a pointer to data. This can be done by uploading a commitment of the data to the blockchain (e.g. a salted hash) rather than the raw data. But one can still upload raw data if wanted. We have recently seen the success of Ordinal NFTs on Bitcoin where a lot of value is placed on uploading raw data. Using blockchain more does not increase energy consumption. The hash rate is not related to the transaction throughput. At scale, it could be very efficient in terms of CO2 per transaction

Cities: The evolving challenges for urban and rural cities

Sylvie Albert, Professor, Department of Business & Administration, University of Winnipeg, Canada, set the scene for the second topic of this webinar and sensitized the audience of the need to support cities in the localization of UN SDGs and the challenges facing cities in doing so. Cities need to be sustainable from a political, economic, socio/cultural/technological and ecological perspective, therefore it is really about all the SDGs.

She pointed to a new book being written by several members of the Global Forum Association providing details on how cities can implement the UN SDGs, resource, and govern their projects in a collaborative manner. Few cities are choosing to do a voluntary local review of their achievements and more work is needed at the local level and in sharing practices if we are to achieve snowball effects in meeting important global targets.

Jeremy Millard, Managing Director, Third Millennium Governance, Denmark, addressed the issue of new localism: The Impact of increased decentralisation and devolution to cities and regions.

How are cities and localities responding to the new global geo-political shocks since 2019 and the strategic challenges these give rise to? How is this turbo-charging moves to de-globalization and new forms of decentralization and relocalization, and what is the role of technology in these processes?

The form, organization and socio-economic dynamics of cities and localities are undergoing dramatic changes driven primarily by politics, historical, cultural and behavioral factors. All of these changed during the 2008 financial crisis and have since been turbo-charged by the recent pandemic, the war in Ukraine and looming environmental breakdown. Digital technology plays a necessary but far from sufficient tool in these changes by enabling new types of policy, governance and management choices to be made that are increasing business and economic opportunities at local and city level.

Recent geo-political changes are leading to the dramatic disruption of global supply changes and increased on- and friend-shoring, such as the EU's 'open strategic autonomy' policy framework and the US's 'inflation reduction act', both of which are changing the terms of trade of cities and localities as well as of countries. A 'new localism' is emerging that focuses on retaining within the locality as much as possible of the value generated locally rather than see this value seep away to international corporations and possibly to tax-havens. This has huge significance for cities which are increasingly seen as the 'sweet-spot' as engines of innovation and enterprise, given they have both sufficient power and resources as well as

closeness to inhabitants in order to better understand their needs, break down silos and partner with all local actors.

For example, new forms of digitally-enabled hybrid-working are now being used regularly by more than half the working populations in the more advanced economies, compared with only about 11% before 2019. This is changing the overall shape of urban areas by reducing activity in very large city centres and significantly contributing to the growth of smaller cities, beyond the traditional commuting suburbs, where all aspects of life and work quality are seen as vastly better. However, these benefits are being enjoyed mainly by the already advantaged workers whilst those in poorly paid and precarious jobs, such as in the gig-economy, are being left further behind.

Namir Anani, President & CEO, ICTC, Canada, addressed the Impact of Digitalization on Cities and identified the many digital tools that cities have at their disposal to solve important new economy imperative and become more sustainable.

Smart cities will be using big data, blockchain, IoT to develop projects around connected health, digital citizenship, e governance, smart farming, smart mobility, sustainable energy, on demand education, intelligent commerce, and more to become more effective, efficient, and sustainable. Smart cities are evolving from technology-centric to citizen-centric models of technology use.

Daniel van Lerberghe, Director & Co-founder, INNOGAGE Ltd., Belgium, spoke about nurturing urban eco-systems to fight climate change and support local economies.

Innovation will be a significant part of solving urban challenges needing the collaboration of a wide range of stakeholders. We have an opportunity to provide a policy toolkit to encourage innovation that starts at the neighbourhood level and is supported by living labs that work collaboratively on enhancing urban attractiveness.

The link between circular economy, urban innovation, eco-friendly competitive economy means that smart cities are not just focusing on digital transformation but on enhancing cities attractiveness and the well-being of all its inhabitants and businesses. Therefore, it is important to focus on nurturing urban eco-systems and propose it as an alternative policy to fight climate change and support local economies.

To this end the Global Forum should be a repository of urban innovation good practices drawing from the events and stakeholder local urban innovation that can be useful for other cities, examples such as www.Artcast4D.eu, Designscapes.eu, or PuriFungui.com. The suggestions are not exhaustive and should be enriched from previous editions of the Global Forum. Technology aims at tackling problems and proposes solutions, so our first question should be what are the main urban challenges of cities today (e.g., mobility, pollution, attractiveness, tourism, jobs, etc …)? The second question should be: What solutions does urban innovation propose? The third question should be: How to overcome existing barriers in urban environments to become a leading digital city?

Hugo Kerschot, Founder & Managing Director Is-Practice, Belgium, presented LOCARD: The use of blockchain in criminal justice (chain of custody).

Digital evidence is currently an integral part of criminal investigations, and not confined to pure cybercrime cases. Criminal behaviours like financial frauds, intellectual property theft, industrial espionage, and terrorist networks leverage the Internet and cyberspace. The very ubiquity of digital devices, e.g. smartphones, in modern society makes digital evidence extremely relevant for investigations about all kinds of criminal behaviour like murder, contraband activities, and people smuggling, to name a few.

Due to its nature, the use of digital evidence in a court of law has always been challenging. It is critical that it should be accompanied by a proper chain of custody, guaranteeing its source and integrity. LOCARD aims to develop a holistic platform aimed at ensuring the chain of custody throughout the flow of forensic analysis. It is a distributed and trusted platform that allows the storage of digital evidence metadata using blockchain.

Each node of LOCARD will be able to independently set its own permission policies and to selectively share access to digital evidence with other nodes when deemed necessary and upon proper authorization through fine-grained policies.

Concluding Remarks

The moderator, Ingrid Andersson, together with Sylviane Toporkoff, thanked the speakers for sharing their precious thoughts and expertise and reminded the upcoming webinar:

Global Forum Thematic Webinar II/2023:
Sustainable Future: Infrastructure, Climate & Global Education
When: April 26, 2023 | 1:30 PM – 3:00 PM CET