

Global Mayor's Forum & 2018 Urban Innovation Conference and the 4th Edition of Guangzhou Award

Parallel Session No. 2: “Blockchain: Tools for Governing Metropolitan and Urban Management”

Summary

Blockchain has become *the* fashion word. It is so topical that it has entered the urban environment in a strong way. Blockchain technology is considered a revolutionary idea, equivalent, for some, to the emergence of the Internet, or even digital computing itself. There are those who view Blockchain as an element of change for the economy and society, with a potential to transform industry and services, as well as social relations. But will the emergence of blockchain bring only technological changes or will it usher a social revolution?

The Internet emerged from military and academic research. Today it is present in all aspects of our digital daily lives. Blockchain began as a solution for the design of digital money. It is rapidly morphing into a powerful instrument for institutional and social coordination. There is a long road ahead, as this instrument is still in its earliest phases of development, but Blockchain is already opening multiple and inclusive markets for all kind of values, making it possible a new Internet of Value.

Metropolis organized this Session No. 2 to better understand what Blockchain is and what it represents, both at a technological, political and social level. What role can it play in social transformation, and whether it can improve the construction of metropolitan governance. Metropolis Observatory Issue Paper No. 5 “*Blockchain, a tool for metropolitan governance?*” was presented as a starting point for a dialogue to explore collective answers to these questions between panelists and audience.

Among its conclusions are the intrinsic interaction between Blockchain and Governance, and the strategic opportunity for China and Metropolis to promote and operate MetroBloc, a Metropolitan Blockchain Living Labs to develop relevant solutions to pressing social challenges and, from this experience, enrich basic research on digital governance as a tool to scale up securely Blockchain itself.

1. Brief Description of the Session

Technology is a resource that can improve people's lives when it is used as part of a broad and sustainable social approach. Blockchain can be a factor for metropolitan change when its potential to transform social interactions contributes towards social and regional cohesion.

Session No. 2 began with the introductory remarks of Octavi De la Varga, Secretary General of Metropolis, presenting Metropolis Issue Paper No. 5 “Blockchain, a tool for metropolitan governance?” (https://www.metropolis.org/sites/default/files/metobsip5_en_1.pdf). Afterwards, its author, Alfonso Govela, Metropolis Consultant on Blockchain and Urban Innovation, talked

about Blockchain and Governance and share the results of a research on actual applications of this technology across the 139 metropolises members of the association.

A Panel with representatives from China, Africa, and the Eastern Mediterranean followed up, and their presentations are included below. Zibin Zheng, Sun Yat-sen University at Guangzhou, addressed basic theoretical issues to prevent fraud and increase trust in Blockchain ecosystems. Deng Mu, Ecosysnet Beijing, talked about using Blockchain to solve the integration of real-world information from IoT to the digital representation of our world that smart cities, among other purposes, require. Chen Haifeng, from China Red Cross Foundation, showed us how this tool can bring together a circle of stakeholders into a transparent and efficient “sunshine charity”. Emmanuel Noah, BenBen, shared a successful strategy to bring order into Land Markets in Ghana through a Blockchain-anchored platform. Finally, Yiannis Karousos, Mayor of Ayia Napa, gave a comprehensive approach to systematically apply this resource to a complete tourist resort.

2. Conclusions

Created as an information technology solution for the design of digital money, Blockchain has become an instrument for institutional coordination. At its beginnings, it made possible to record ownership and transmission of digital money through robust, safe, transparent, distributed and auditable means. However, we soon realized that its trust-less consensus among unknown peers in decentralized networks, makes possible the interchange of any kind of value that is susceptible to be represented as a digital asset.

One of the paradoxes of Blockchain is that while it reaches digital consensus for registry of individual transactions independently of any personal trust, the complete register of all transactions becomes quite trustful for the humanity of its participants and users.

Therefore, Blockchain allows us to create new landscapes of trust where new ecosystems for interchange of values can thrive. This ecology of trust is pertinent for metropolitan governance so heavily dependent on precisely those two issues: trust and consensus.

Blockchain, since its origin, is intimately linked to algorithmic governance of the network it serves. The scalability of this resource, however, is an issue still pending. Maybe it is time to feedback lessons from historic human governance to conceptualize new digital ways to scale up this technology securely.

A synergy becomes evident, Blockchain can help us define and operate innovative landscapes of trust to govern and manage metropolises, while daily activities on the side of metropolitan governance and urban management can provide tested models of human consensus to complement new algorithms for digital trust-less agreement.

Living Labs can be a productive resource to explore this synergy. We can bring stakeholders into a well-proved co-creation environment to develop, on one hand, Blockchain applications for our metropolises and, on the other, to distill lessons learned from human governance into innovative feedback for Blockchain research itself. We can create, promote and operate MetroBlock Labs as living environments of interaction to solve pressing social challenges.

A collaboration between China and Metropolis can be a productive strategy to advance these MetroBlock Labs and applications of Blockchain to metropolitan governance. China has a growing knowledge base on Blockchain with the largest number of global patents in the field

due to its policies of foundational research and protection of intellectual rights. Metropolis has a global network of major cities whose daily operative problems provide a unique set of challenges to solve. Together we can impel the intrinsic link between Blockchain and Governance from both directions: digital and human.

3. Summary of Individual Presentations

3.1 “Blockchain, a tool for metropolitan governance?”

Alfonso Goveia, Metropolis

Session No. 2 began with presentation of Metropolis Issue Paper No. 5 “Blockchain, a tool for metropolitan governance?” and its research on the use of this new technology across 254 Blockchain applications in 69 cities of the 139 members of the Association.

This introductory presentation explained what Blockchain is, the situation of actual real-world applications, potential directions to go from here, and ways to get there.

Blockchain and governance go together. Governance helps Blockchain build trust-less consensus to link valid and therefore trusted chains of records in distributed ledgers across decentralized networks. Blockchain helps create new Landscapes of Trust that become instrumental for institutional coordination of innovative human governance.

Six lines of action distill from the detected 254 Blockchain applications: citizenship and democracy, land markets and real estate, infrastructure and services, ecosystems of values, governmental processes, and alternative financial instruments.

Along 139 Metropolitan Regions of the Association, Blockchain applications are distributed 46% across Asia, 17% in Latin America, 16% in Africa, 10% in Europe and 10% in North America. More than half, 57.8% are for business and financial purposes, 9.1% to promote Blockchain environments, 6.7% for government uses, 6.7% for social goals, 4.3% for health, 3.9% for land registry, 3.9% for energy management, and only one application for environmental purposes.

Five metropolitan governance priorities can benefit from Blockchain: a people-oriented agenda, through inclusion and rights; local autonomy and governance, through transparency and accountability; territorial cohesion, through decentralized and collaborative ecosystems of interaction; environmental sustainability, through protection of natural assets; and financial policies, through new resources and instruments of digital money.

3.2 “Blockchain: Development Trend and Applications”

Zibin Zheng, Sun Yat-sen University

Prof. Zibin Zheng presented theoretical advances of Blockchain, the importance of its use in local Chinese governments, and how people perceive the potential of this resource according to the Gartner Hype Cycle.

Gartner Hype cycle measures expectations for emerging technologies over time. In 2016 Blockchain was at the top of the “Innovation Trigger” (Phase 1) just below “Peak of Inflated Expectations” (Phase 2). By next year, however, it slid down to the “Through of Disillusionment” (Phase 3), and now it is at the beginning of the “Slope of Enlightenment” (Phase 4), waiting to reach the “Plateau of Productivity” (Phase 5).

In May 2018, Blockchain entered Chinese National Planning with the highest level of support, as President Xi Jinping called for efforts to develop China into a world leader in science and technology. As a result, 24 provinces, cities and regions in China issued policies and guidance for Blockchain implementation, to take advantage on its power to change relations of production in order to facilitate the emergence of a new society and organization.

At Sun Yat-sen University Inplus Lab, Prof. Zheng's Blockchain research is dedicated to build stronger foundations of trust, support development of basic computing infrastructure, promote applications with social impact, and teach about Blockchain to a large number of students.

Better environments of trust are possible through their studies on Blockchain objective operational performance metrics, data visualization analysis to identify abnormal transaction patterns for anti-money laundering and fraud identification purposes, detection of Ponzi schemes -400 already running on Ethereum-, address identification of fishing fraud groups -also on Ethereum-, complex network analysis and network decomposition to detect market manipulation, and Blacklist sharing to diminish inter-agency distrust and serious data islands in the credit industry.

Nebula Platform, their platform to share computing resources is building the next generation of cloud computing to expand basic digital infrastructure.

Current applications with social impact are a Copyright Trading Platform, to register and confirm artistic rights and transactions with anti-counterfeiting of art works. Traceability Systems, to add traceability information to the chain, trace logistics information, and query traceability information. And a Time Bank as an institutional registry, task release, and balance checks for social work at community levels.

3.3 “Panorama of Blockchain applications in China from an entrepreneurial and private sector perspective”

Deng Mu, Founder/CEO of Ecosysnet Technology

Blockchain, for Dr. Deng Mu, plays a special role in the interaction of our real world with its data representation and digital processing. If Internet provides a carrier for the rapid transfer of informatized data, Blockchain allows for the identification, traceability, and real-time clearing of such data.

By collecting information in real time, the Internet of Things becomes a digital gateway to the physical world, in parallel Blockchain can provide trust for its inputs, security for its registers, and consensual mechanisms for a reliable decentralized delivery through its distributed system.

Blockchain, therefore, can help remove some of the biggest obstacles of building a digital city: inter-brand/inter-platform connection and communication. Information properties can become digital assets in new ecosystems that bring together users, government regulators and industries. Several proof of concepts in China providing corporate independence, data encryption and effective integration for easier interchange of “property data” were shown: Parking, Hotel management, Air Ticketing management, Credit as a Service, Smart Logistics, Shipping, Loyalty program cross-sharing, Digital banking, and cross-border payment.

3.4 “Experience and Reflection on the Application of Blockchain in the field of social governance”

Chen Haifeng,

China Red Cross Foundation linked a peer-to-peer charity fundraising and a disaster relief platform with a Blockchain Laboratory to coordinate allocation of help, follow up actions to be taken, verification of needed supplies, supervision of available funding, and quick response to social demands.

Blockchain helps coordinate the flow of information among the nodes in their network: Beneficiaries, Hospitals, Charity Associations, a Donation Platform. and the departments of Public Welfare and Civil Affairs. It facilitates data sharing, reduce monitoring costs, reduce material supplies fraud risk, e-processing of demands, certificates, and, above all: “sunshine charity”.

This one-stop platform makes possible calls for help from any devices, anytime, anywhere. Quick set-up and use for fundraising operations. Timely acceptance and integration of donations for self-help, mutual assistance and rescue actions across low-income households. Charities and hospitals, on the other hand, can easily recover settlement of expenses with a standardized and strict, but benevolent, process that eliminates any need for cash withdrawals.

Its pilot project registered an average monthly fundraising of a total of 338,000 yuan (50,000 USD) through 40 individuals each raising 8,400 yuan (1,242 USD) in 8,225 donations of approximately 41 yuan (6 USD) each.

Its social benefits include precise poverty alleviation through a mix of crowdsourcing, charity and corporate donations; promotion of “everyone’s charity”, a relevant social cooperation that enhances public welfare; support doctors reduce social conflicts through systematic help of patients; and improvement of social credibility of charity organizations through public tracking mechanisms of data and real-time queries.

3.5 “Facilitating Digital Transactions in Emerging Land Markets. Impact on Investment and Development”

Emmanuel Noah, Co-founder of BenBen

Land is a fundamental asset for cities but its registry, in many places, lack proper conditions. Inefficient records difficult proofs of ownership, slow down operation of land markets, deter fiscal and land use policy making, and interfere with mortgages and land related financial instruments.

Blockchain with its immutability of registers, transparency of data and traceability of transactions can prevent disputes and increase investor confidence through time stamping logs of all land transactions, offering a proof of transaction with an audit trail to prevent double lending or property fraud.

An African Platform, BenBen includes all stakeholders of the land market in Ghana: sellers, buyers, local authorities, banks and financial institutions, developers, property appraisers, notaries, and real estate agents.

Its winning strategy derives from a unique public private partnership that circumvents the need to start with the enormous initial effort to build from scratch a complete land registry, or even

document an existing one. It proceeds instead in a gradual fashion through trigger points that register the underwriting of loan applications to fund particular purchases. Slower, yes, but less demanding on initial resources to detonate a process that brings certainty step by step from the present onwards, operating, by its simple logic, where the market is more active, and where actions need to be taken.

Trusted land data comes from consensus-based oracles. An oracle is an agent that finds and verify real-world occurrences and submit this information to a blockchain to be used by smart contracts. Consensus-based oracles rely on aggregating data from several oracles with proprietary methods for determining their authenticity and accuracy.

Based on Bitproperty, a real estate tokenization platform on the Ethereum blockchain, where anyone can create, buy, or sell rights to real estate revenue streams with a new kind of asset class: tokens. Tokens are digital representation of real-world assets, in this case land ownership.

A digitalized land market ecosystem brings societal benefits. Digitally secured assets increase value of the asset class. Low operating cost in paperless property transactions. Secure ways to offer property as collateral unlock value. Reduce conflict in property-related litigation. Secure property generates and stores value to pass on to next generations.

3.6 “Blockchain for Citizens and Tourism in Ayia Napa, Cyprus 1st City for Blockchain implementation”

Mayor Yiannis Karousos

An important tourist destination in the Eastern Mediterranean, Ayia Napa is small, population wise, but a major contributor to Cyprus economy. With the University of Nicosia, UNIC, Ayia Napa prepares a strategic plan to make it the first local city for a comprehensive Blockchain implementation to benefit both citizens and visitors.

A platform for data verification can certify frequent weddings at the resort, confirm hotel occupancy, monitor water consumption and leakage through Internet of Things, gather and share this information for mining with Artificial Intelligence, create a local market for renewable energy sharing, deploy a micro-grid for producing, storing and distributing this resource to hotels and city.

A system to tokenize and reward tourist experiences and loyalty, as well as awards for recycling, is under study, coupled with a proposal for a municipal cryptocurrency to promote spending at the resort, and to facilitate new instruments for project financing in the region.

Ayia Napa recognizes that a parallel social strategy is vital for the introduction of new technological instruments when the national government does not have still enough knowledge about Blockchain and there is no legal framework to regulate its applications. An alliance with academia at UNIC, and a working group to co-create a collaborative implementation of the technology, has succeeded in getting the interest of the Council of Ministers, and set the foundation for the city to continue its implementation.

4. Bios of Speakers

Mayor Yiannis Karousos of Ayia Napa, Cyprus, has been re-elected for a second term 2016-2019. Keen on making Ayia Napa a No.1 world-class tourist destination, has signed an agreement with the University of Nicosia (UNIC) Research Foundation to apply innovative technologies such as artificial intelligence, smart cities, and Blockchain to improve the municipality's productivity and services provided to citizens and visitors.

Dr. Deng Mu, Founder/CEO of Ecosysnet, provider of blockchain-enabled solutions for finance, the sharing economy, supply chain management, remittance solutions, and smart city. Has been Assistant Vice President for Market Rise Management Department of the Chinese Bank Corporation, and core member of the Singapore Risk Management Institute.

M.E. Chen Haifeng, Executive Director of Bubi (Guangzhou) Blockchain Technology Research Institute, member of the Finance Technology Expert and Blockchain Expert Committees of Guangzhou Finance Association, and Director of the Digital Chain Technology Blockchain Research Office of the Chinese Red Cross Foundation.

BS. Emmanuel Noah, Accra, Ghana, CEO of BenBen, a Ghanaian based proptech firm leveraging Blockchain Technology for reducing the barriers of entry and access to African mortgage, housing and land markets. One of the OECD (Organization of Economic Cooperation and Development) top 10 Blockchain innovations in public sector. He is a distinguished 2018 United Nations Solution Maker, and Advisor on the National Property Reforms Working Group of the Government of Ghana.

Dr. Zibin Zheng, Guangzhou, Associate Professor, School of Data and Computer Science, SYSU, 2015 ACM (Association for Computing Machinery) China Rising Star Nomination Award. 2014 Outstanding Leadership Award, IOV'14. An often quoted researcher (154 publications, 4,451 citations and 65,400 reads) he shall provide a sound scholarly overview of Blockchain Technology, Big Data and Computing Intelligence.

M.Arch.A.S. Alfonso Goveia, MIT & UIA, Co-Founder of DigitalCivix, a NGO Partner of UN-Habitat to advance Civic Literacy, and empower citizenship in our Digital Era through platforms of knowledge, ecosystems of interaction, and interfaces of governance. Promoter of City Coins, Tokens of City Life, and the series of City Changer, City Builder, City Maker and City Blockchain Labs. Expert on Blockchain and Cities. Metropolis Consultant on Blockchain and Urban Innovation.