**Joint Inspection Unit
of the United Nations System**

www.unjiu.org

*"Independent
system-wide
inspection, evaluation
and investigation"*

Review Highlights   JIU/REP/2020/7
March 2021

BLOCKCHAIN APPLICATIONS IN THE UNITED NATIONS SYSTEM: TOWARDS A STATE OF READINESS

Inspector Petru Dumitriu

Background

Blockchain is among the technologies whose fusion and interaction across physical, digital and biological systems define the profile of the fourth industrial revolution. Although the technology is still young, weighing the trade-offs and determining regulatory action and operational frameworks should be a subject for multi-stakeholder dialogues, including in the United Nations system. The 2030 Agenda and the strategic calls for innovation that have followed it prompted some organizations to take the lead and pilot blockchain applications, mostly for operational activities.

There is considerable work in progress in the United Nations system: standards are being developed, legal aspects examined and blockchain pilots carried out. Ten organizations use blockchain applications for different types of projects and operations, individually and in collaboration. The ongoing use cases, most of them at field level, include supply chain, digital payments, tracing of livestock, digital identity and land registration. Most organizations that are not using blockchain now, are considering a possible use in the future. Their interest will grow and mature as innovation in blockchain accelerates.

Against this background, the report intended to provide a contribution to the collective efforts triggered by recent overarching strategies on new technologies and the future of work, which address the issue of innovation and the use of digital technologies by the United Nations system in an action-oriented approach.

The use of blockchain was viewed in the context of the achievement of the Sustainable Development Goals, in support of the vision contained in the report of the High-level Panel on Digital Cooperation convened by the Secretary-General.

Objectives

The specific objectives of the JIU review of blockchain applications were to:

1. Map the current use of blockchain applications in the United Nations system;
2. Compile the lessons learned during this phase of incipient development and identify good practices;
3. Identify the main challenges and risks related to the use of blockchain;
4. Explore the potential use of blockchain to facilitate greater inter-agency cooperation and efficiency;
5. Provide inputs for developing guidance, standards and frameworks for the future use of blockchain applications.

What the JIU found

There is an increasing interest in the United Nations system in the use of blockchain applications, including among organizations that are not contemplating an immediate adoption of the technology. Several organizations took the lead in experimenting with blockchain projects and can provide the system with valuable lessons learned and some promising practices.

The ongoing blockchain applications do not offer a critical mass, quantitatively and qualitatively, to demonstrate the usability and relevance of blockchain in its specific core features. Some assumptions are not confirmed yet; characteristics such as immutability and decentralization need more testing.

The report was an attempt to encourage a new silo-breaking and collaborative approach that blockchain technology allows and supports. A real state of readiness in using blockchains, if and when needed, should be irreversibly built on inter-agency cooperation.

1. Need for minimum policies and standards

While rigid regulation of blockchain at too early a stage may still be counterproductive, minimum policies and standards are expected by both users and solution providers in order to reduce legal uncertainty and encourage innovation. Most participating organizations agree that policies and standards are necessary in order to reduce legal uncertainty and encourage innovation. When applicable, the use of blockchain applications should be integrated - together with other digital technologies - into the innovation strategies and policies adopted by their respective organizations.

2. Building of in-house technical expertise

The views on the need of in-house technical expertise may diverge, but most participating organizations consider that building such expertise is useful and realistic.

3. Use of open-source blockchain solutions

The creative use of open-source blockchain solutions is feasible and can reduce vendor lock-in and other forms of excessive dependence on the market. In line with the call by the Secretary-General in his Roadmap for Digital Cooperation for the United Nations to deploy digital public goods, organizations should ensure that the software development they undertake will follow, to the extent possible, open-source principles and that the codes that are developed are made available to other United Nations organizations. The report also recommends that a United Nations representative in charge of digital technologies and related issues is being assigned the task of following the development of blockchain interoperability standards and open-source projects aimed at blockchain interoperability, as part of an overall consideration of the policy implications of the technology, working with all organizations in the United Nations system.

4. Blockchain's network vocation supports inter-agency collaboration and partnerships

Blockchain, by virtue of its network vocation, carries unprecedented opportunities for inter-agency collaboration and collective engagement in support of the Sustainable Development Goals, while working in silos will be a recipe for a waste of resources, duplication, lack of coherence and blind dependence on commercial terms.

Partnerships with other stakeholders can take new forms, but the trust and reputation aspects need to adhere to the existing rules.

5. A culture change towards innovation and collaborative approach

Blockchain implies a need for culture change at the level of inter-agency collaboration: for example, acceptance of the role of leading organizations or coalitions of the willing as a driving force in innovation efforts; encouraging collective engagements in using blockchain in support of the Sustainable Development Goals; joint investment in blockchain projects; and incentivizing cooperation. One of the most optimistic findings of the present review is that the first years of blockchain practice in the United Nations system confirm an already healthy emerging tendency towards inter-agency cooperation. The most significant ongoing projects are already being undertaken by two or more organizations and are open to other willing organizations, while system-wide standards are being developed with multiple inputs. Even pilot projects developed at the country level have openness and inclusion built in, as illustrated in the present report.

A real state of readiness in using blockchains, if and when needed, should be irreversibly built on inter-agency cooperation. The report recommends, among others, to enhancing coherence and coordination at the system-wide level, including by knowledge-sharing, capacity-building, and adoption of an inter-agency governance framework. It also recommends that organizations, if they have not already done so, endorse the Principles for Digital Development, as a first step to ensuring a general common understanding of digital transformation at the organizational level, including the possible use of blockchains. It finally suggests that the governing bodies of the United Nations system organizations should encourage Member States to engage with the United Nations Commission on International Trade Law (UNCITRAL) in its exploratory and preparatory work on legal issues that relate to blockchain in the broader context of the digital economy and digital trade, including on dispute resolution, which is aimed at reducing legal insecurity in that field.

March 2021

What the JIU found

6. Decisionmaking matrix for blockchain as practical guidance

Finally, the report proposes a comprehensive decisionmaking matrix for blockchain as practical guidance for the determination of future business cases. Organizations should ensure that any decision on using blockchains should be based on an appropriate determination of the business case and of the most suitable solution, using as guidance a decision-making matrix, as described in the present report, as well as any enhancements and/or adaptations thereof. The examination of possible blockchain use cases should be further based on assessments of project risks, including with respect to relevant organizational policies and regulations on privileges and immunities, data protection, confidentiality, cybersecurity, system integrity and reputation.
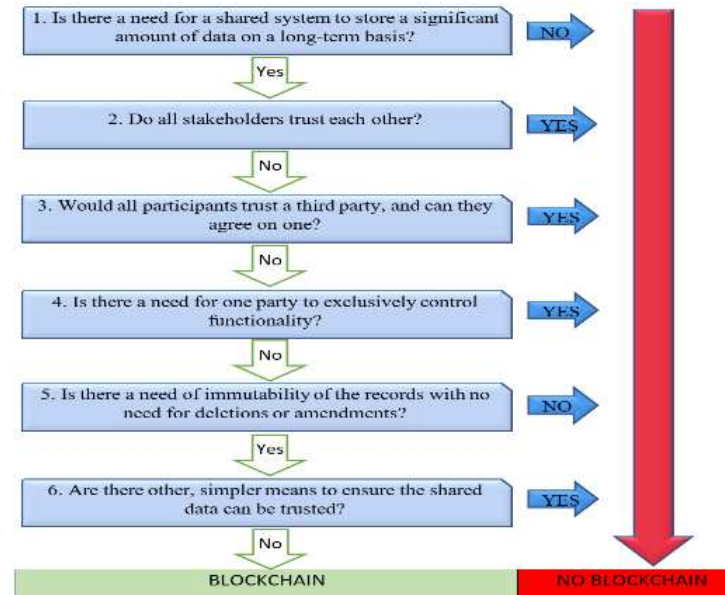
Methodology

In accordance with JIU norms, standards and guidelines and its internal working procedures, the methodology followed in preparing the report included an extensive literature review, an in-depth desk review and analysis of existing policies and practices related to the use of blockchain technology. Data collection and analysis relied on both qualitative and quantitative methods.

Data collection instruments included:

- Questionnaires to all JIU participating organizations and the International Computing Centre;
- Structured and semi-structured interviews with officials in the United Nations system;
- Ad hoc brainstorming sessions and participation in meetings of blockchain practitioners;
- Consultations with representatives of the industry and government authorities that have adopted specific legislation with respect to blockchain;
- Dialogue and consultations with other international organizations;
- Use of open sources for information and learning on blockchain, including online courses on the LinkedIn, edX and Coorpacademy platforms

The team interviewed members of staff of and benefited from presentations by the International Organization for Standardization, the World Economic Forum and the World Bank, as well as from legal experts and blockchain solution providers from governmental authorities, start-ups, networks and platforms.
In its assessment, JIU was also guided, as appropriate, by the principles of a SWOT analysis to identify strengths, weaknesses, opportunities and threats related to the efficient use of blockchain applications in the context of the United Nations system.

The review was preceded by preliminary research and preparatory activities, such as a special dialogue held in April 2018 on how blockchain technology can help to finance the Sustainable Development Goals as part of an international conference, organized by JIU in follow-up to a report on partnerships with the private sector, and a conference on the theme of "Blockchain for impact", co-organized by JIU and Geneva Macro Labs, held in September 2019, both with multi-stakeholder participation. The Author also attended meetings under global auspices, such as the second Geneva Blockchain Congress and the World Economic Forum in 2020.

> **"The 2030 Agenda for Sustainable Development and the strategic calls for innovation that have followed it, have prompted some organizations to take the lead and experiment with blockchain applications, mostly for operational activities."**
>
> **"There is considerable work in progress in the United Nations system: standards are being developed, legal aspects examined and blockchain pilots carried out."**
>
> **"Some organizations are contemplating visionary ideas for very ambitious applications based on blockchain: a coronavirus disease (COVID-19) vaccination certification infrastructure, a unique United Nations identity and a draft governance framework for humanitarian assistance."**
>
> *Inspector Petru Dumitriu*

What the JIU Recommends

The report includes eight formal recommendations, addressed to the governing bodies of the United Nations system organizations (2), the Secretary-General of the United Nations (1), and the executive heads of the United Nations system organizations (5).

1 The governing bodies of the United Nations system organizations should ensure that, when applicable, the use of blockchain applications will be integrated, together with other digital technologies, into the innovation strategies and policies adopted by their respective organizations.

2 The executive heads of the United Nations system organizations should make sure that the examination of possible blockchain use cases will be based on assessments of project risks, including with respect to relevant organizational policies and regulations on privileges and immunities, data protection, confidentiality, cybersecurity, system integrity, and reputation.

3 The executive heads of the United Nations system organizations, if they have not already done so, should endorse the Principles for Digital Development by the end of 2022, as a first step to ensuring a general common understanding of digital transformation at the organizational level, including the possible use of blockchains.

4 The executive heads of the United Nations system organizations should ensure that any decision on using blockchain should be based on an appropriate determination of the business case and of the most suitable solution, using as guidance a decisionmaking matrix (as described in the present report, as well as any enhancements and/or adaptations).

5 The Secretary-General, in consultation with the executive heads of the United Nations system organizations, with support from the International Telecommunication Union, should assign, by the end of 2021, to a United Nations representative in charge of digital technologies and related issues, the task of following the development of blockchain interoperability standards and open-source projects aimed at blockchain interoperability, as part of an overall consideration of the policy implications of the technology, and to work with all organizations accordingly.

6 The governing bodies of the United Nations system organizations should encourage Member States to engage with the United Nations Commission on International Trade Law in its exploratory and preparatory work on legal issues that relate to blockchain in the broader context of the digital economy and digital trade, including on dispute resolution, which is aimed at reducing legal insecurity in that field.

7 The executive heads of the United Nations system organizations that have developed blockchain applications - in line with the call by the Secretary-General in his Roadmap for Digital Cooperation for the United Nations to deploy digital public goods – should follow, whenever possible, open-source principles when they develop software, and make available the codes to other United Nations organizations.

8 The executive heads of the United Nations system organizations, through the relevant coordination mechanisms, including with support from the United Nations International Computing Centre, should consider the adoption of a non-binding interagency blockchain governance framework for use by interested organizations, with a view to ensuring coherent and consistent blockchain approaches across the system by the end of 2022, including for projects that may involve multiple United Nations organizations.

The report also contains nine soft recommendations. Most of the soft recommendations are meant to disseminate good practices and improve blockchain knowledge-sharing at the system level.

Click to access the full report

JIU Reports 2020/2019

JIU/REP/2020/8, Review of mainstreaming environmental sustainability across organizations of the United Nations system

JIU/REP/2020/6, Multilingualism in the United Nations system

JIU/REP/2020/5, Enterprise risk management: approaches and uses in United Nations system organizations

JIU/REP/2020/4, Review of management and administration in the Economic Commission for Latin America and the Caribbean

JIU/REP/2020/3, Review of common premises in the United Nations system: current practices and future prospects

JIU/REP/2020/2, Policies and platforms in support of learning: towards more coherence, coordination and convergence

JIU/REP/2020/1, Review of the state of the investigation function: progress made in the United Nations system organizations in strengthening the investigation function

JIU/REP/2019/9, Review of contemporary practices in the external outsourcing of services to commercial service providers by United Nations system organizations

JIU/REP/2019/8, Review of staff exchange and similar inter-agency mobility measures in United Nations system organizations

JIU/REP/2019/7, Review of the management and administration of the Joint United Nations Programme on HIV/AIDS (UNAIDS)

JIU/REP/2019/6, Review of audit and oversight committees in the United Nations system

JIU/REP/2019/5, Managing cloud computing services in the United Nations system

JIU/REP/2019/4, Review of change management in United Nations system organizations

JIU/REP/2019/3, Review of the integration of disaster risk reduction in the work of the United Nations system in the context of the 2030 Agenda for Sustainable Development

JIU/REP/2019/2, Review of the United Nations System-wide Action Plan on Gender Equality and the Empowerment of Women

JIU/REP/2019/1, Review of management and administration in the International Civil Aviation Organization (ICAO)

For all reports visit: https://www.unjiu.org/content/reports

For further information, please contact jiucommunications@un.org

ABOUT THE JIU

The Joint Inspection Unit is the only independent external oversight body of the United Nations system mandated to conduct evaluations, inspections and investigations system-wide.
Visit the JIU website for more information at www.unjiu.org

| JIU | 11 | Latest | Reports, notes | Main | 2020 | 28 Participating |
| Statute | Inspectors | news | and management letters | thematic areas | Programme of Work | Organizations |