

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION  
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

**Geneva, Switzerland  
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Contribution by Turkey

to the CSTD 2020-2021 priority theme on “Harnessing blockchain for sustainable  
development: prospects and challenges”

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## **PRIORITY THEME 1:**

Harnessing blockchain for sustainable development: prospects and challenges

**1. Could you share specific examples, projects or initiatives that have used or plan to use blockchain technology for the SDGs in your country? What are the main challenges confronted while trying to implement these projects/initiatives? (Examples may include blockchain solutions for financial inclusion, trade facilitation, supply chains, health, energy, e-Government, etc.)**

To facilitate the work of blockchain in Turkey, Blockchain and Research Network (BAG) platform has been established. Its purpose is to facilitate R&D activities on blockchain technology related issues and to ensure that researchers who want to do R&D work together.

The BAG platform is supposed to increase national know-how rapidly by enabling researchers to work in various fields of blockchain to develop fruitful projects together by combining their efforts and using resource more effectively. Blockchain test networks are being used by distinguished public and private stakeholder organizations such as TÜBİTAK BİLGEM, Bahçeşehir University, İstanbul Gedik University, Kadir Has University, İstanbul Ticaret University, Ankara Yıldırım Beyazıt University, Antalya Bilim University, Konya Necmettin Erbakan University, Gebze Teknik University, Kırklareli University, Turkcell, Turkish Airlines and Havelsan. Additionally, The National Digital Identity Management Infrastructure project is also developed by using the resources of the BAG system. Ethereum, Hyperledger Fabric and Hyperledger Indy blockchain test networks have been established and used in test studies. Moreover, a platform called Blockchain Turkey was founded in June 2018 by Turkey Informatics Foundation (TBV) and has reached 71 members from more than 10 different industrial sectors as of September 2020. The platform is operating in order to increase the national potential and public awareness of blockchain technology, to use its valuable benefits and to determine strategic priorities for the ecosystem by providing training, organizing events, producing and publishing relevant content, evaluating the current opportunities and application of blockchain technology. There are several projects employing blockchain technology in Turkey, such as crypto money studies. In the gold-based crypto money development project (BIGA) of TAKASBANK, field tests of the system have been made. Academic studies are carried out on the design of the Central Bank Digital Currency, which is considered to become widespread in the near future. Much more extensive work is needed to develop the blockchain-based digital Central Bank money. BZLAB creates the necessary infrastructure that can be used in the development of our a national cryptocurrency. Another project is the Blockchain-based Next Generation Decentralized Digital Identity Infrastructure (MODKA) which has been conducted by TÜBİTAK BİLGEM UEKAE. It is important that this infrastructure will be integrated with existing identity systems and other infrastructures so that it can be used as the future national digital identity management backbone of Turkey. In the MODKA development work, it is aimed to be prepared for the Internet of Things (IoT) age by drawing the framework of digital identity life cycles for legal entities. Blockchain technology will be combined with the cryptographic and e-identity expertise of TÜBİTAK. All components needed within the scope of the digital identity ecosystem are developed at the prototype level. The first version of the system will be ready for testing, soon. In case MODKA is put into use on a national scale, it will pave the way for many structural transformations with the leading role it will assume in the electronic transformation of national information systems. It is predicted that a properly prepared identity system can make an economic contribution equivalent to 3% to 13% of GDP. However, the security and privacy level of existing processes will be further increased. As a result of the transformation of usage scenarios with public and / or private sector stakeholders in Turkey (in the fields of education, logistics, health, import and export, finance, GSM operator services, law, etc.), unnecessary intermediary structures will be eliminated and the level of security and speed will be

increased. What is more, TÜBİTAK is offering attractive grant possibilities for the projects proposed by academic, public and private institutions and researchers.

**2. National systems of innovation affect how different countries can harness blockchain for increasing competitiveness, growth and sustainable development. Please share information about the ecosystem of innovation in blockchain in your country by informing: What are the key industries/specific sector that are pioneer in blockchain innovation in the country? What are the key actors in the national ecosystem of innovation (entrepreneurs, development teams (firms), venture capital, Banks and financial services, academia, regulators)? What are the key networks of the ecosystem in your country (including online networks, innovation hubs, forums, etc)? What are the national strategies, policies, laws and regulations (in place or preparation) related to blockchain?**

Based on the needs of public and private institutions/organizations, a Blockchain Research Laboratory has been established under TÜBİTAK BİLGEM UEKAE to carry out R&D activities on the infrastructure, installation, security and privacy analysis, business models, crowdfunding approaches and various technical details of blockchain technologies. BİLGEM cooperates with public and private institutions/organizations/academicians and offers blockchain-based design and development solutions to establish more efficient and transparent structures. In this context, efforts are made to establish networks to simplify and secure all kinds of electronic transactions, from financial movements, supply chains, Internet of Things (IOT) to risk management and healthcare services. The aim of BİLGEM is to bring the most powerful experts in their field together to improve the understanding and use of blockchain technology, to carry out scientific and academic studies, to observe national interests about state-of-the-art and to provide value through actions such as applied analysis and R&D. For these purposes, BİLGEM organized two blockchain conferences nationally in Ankara (2018) and Istanbul (2019). The works presented by the stakeholders included the sector applications of blockchain such as finance, marketing, health, law, telecommunication, mobile broadband, cyber security, health, energy, environment, food, supply-chain etc. Moreover, Blockchain Summer School has been organised by BİLGEM in 2019 and 2020 in order to spread the notion and philosophy of blockchain technology to undergraduate and graduate student level.

**3. What are the challenges that your government have faced or may face for promoting innovation and competence building in blockchain in your country, to contribute to national development priorities and accelerate the progress towards the SDGs?**

Since it is a relatively new technology, it consists of some struggles. "Lean Blockchain" report, which has been prepared and published by Interbank Card Center of Turkey in May 2020, states that it's necessary to change the way of thinking to develop a solution where the real benefits of distributed, unchangeable, smart contracts can be realized. Since it is not easy to change old habits, we can take it naturally that this spreads over time and therefore the spread of technology is slow. World Economic Forum (WEF) lists the three main obstacles to technology as regulations, negative perception and immaturity of technology. These observations are all valid for Turkey. Moreover, the Covid19 pandemic prevented even the big actors of private sector to adopt new technologic investments such as blockchain. However, it's worth stating that the new pandemic world creates new opportunities for microscaled firms, which have the ability to be braver and agile.

**4. What are the actions that the international community, including the CSTD, can take to contribute to harnessing blockchain for sustainable development?**

Regulatory and legal frameworks should be established with international agreements. Particularly, the laws for cryptocurrencies and financial products that use blockchain technology should be regulated by proactive international communities, since they are monetary issues mostly. Moreover,

smart contracts implemented using blockchain are empowering the trust between parties and these liabilities should be taken into consideration. To sum up, the decentralized world brought to us by blockchain products should be carefully regulated by international cooperation.

**5. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.**

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**6. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?**

In the 11<sup>th</sup> Development Plan (2019-2023), which has been prepared and published by Presidency of the Republic of Turkey in 2019, states that Blockchain-based digital central bank money will be implemented. Necessary legal and physical infrastructure projects in transportation and customs services will be completed in order to facilitate use of blockchain applications, it claims. Additionally, it is planned that processes and technological infrastructure will be improved in order to utilize new technologies such as big data, cloud computing, mobile platforms, internet of things, artificial intelligence and blockchain in development of public services (e.g. e-government). Furthermore, as it is emphasized in 2023 Industry and Technology Strategy developed by The Ministry of Industry and Technology, the development of the national blockchain infrastructure will be encouraged to create a new and emerging technology, a blockchain-based network. In order to have an application development competency on blockchain technology, all public-centered applications (such as title deed registration, diploma, customs applications, etc.) will be identified and projected under the "Open Source Platform" initiative. In the blockchain infrastructure developed for testing new, secure business model and processes (supply chain, banking, legal follow-up applications, etc.), a test environment and a participants cluster will be created for pilot applications. It is aimed to create a "regulatory sandbox" together with the regulatory committee for the compliance tests of the developed blockchain applications, to certify the initiatives that have successfully completed the tests and to support their investment. Therefore, special attention has been given to blockchain technology while developing a digitalized government and nation in the long run.

## **Inputs from the Ministry of Industry and Technology**

**PRIORITY THEME 1:** Harnessing blockchain for sustainable development: prospects and challenges

### **United Nations Commission on Science and Technology for Development (CSTD)**

Dear CSTD member,

As you are aware, the CSTD 23<sup>rd</sup> annual session selected “Harnessing blockchain for sustainable development: prospects and challenges” as one of the priority themes for its 24<sup>th</sup> session (2020-21 period).

In an increasingly digitalized economy and society, the security and accountability of data transactions are critical elements for creating trust and enabling breakthrough innovations in the digital world. In this regard, blockchain technology has been perceived as a game-changer, with the potential to revolutionize processes from finance to pharmaceutical industries, from humanitarian work to development aid. The blockchain serves as the base technology for cryptocurrency, enabling open (peer-to-peer), secure and fast transactions. The application of blockchain has expanded to include various financial transactions (online payments and credit and debit card payments) as well as IoT, health and supply chain. However, issues associated with scalability, privacy concerns, uncertain regulatory standards and difficulties posed by the technology in integration with existing applications are some of the potential market constraints. The priority theme will focus on the importance of developing a local financial infrastructure that avoids financial exclusion of the most vulnerable communities. There is also the risk that the potential of blockchain for solving developmental problems had been somewhat inflated by its early adopters and the tech media and may not be as applicable for developing and least developed countries. What are the emerging uses of blockchain that can be breakthroughs in accelerating progress towards the SDGs? What are the potential negative unintended social and economic effects of this technology? How could governments maximize the opportunities and minimize the risks? The CSTD could consider this priority theme to examine the potential of harnessing blockchain for sustainable development.

The CSTD secretariat is in the process of drafting an issues paper on the theme to be presented at the CSTD inter-sessional panel meeting. In this context, we would like to solicit inputs from the CSTD members on this theme. We would be grateful if you could kindly answer the following questions based on your experience from your country or region.

1. Could you share specific examples, projects or initiatives that have used or plan to use blockchain technology for the SDGs in your country? What are the main challenges confronted while trying to implement these projects/initiatives? (Examples may include blockchain solutions for financial inclusion, trade facilitation, supply chains, health, energy, e-Government, etc.)

In the context of Agriculture and Food Accelerator Program developed by Ankara Development Agency, one priority is given to the integration of blockchain technologies in the food supply chain as a measure of traceability and security of food throughout the processes of its distribution and transformation from the farm to the consumers. By prioritizing this measure, Ankara Development Agency encourages development of blockchain technologies to be used in the agri-food sector by the technology developing enterprises and the integration of these technologies by the agricultural and food producers. An important challenge is that since both blockchain technologies and product&technology development in the agri-food sector in Turkey is a very new phenomenon, there are no applications made by the technology developing enterprises in this area.

2. National systems of innovation affect how different countries can harness blockchain for increasing competitiveness, growth and sustainable development. Please share information about the ecosystem of innovation in blockchain in your country by informing: What are the key industries/specific sector that are pioneer in blockchain innovation in the country? What are the key actors in the national ecosystem of innovation (entrepreneurs, development teams (firms), venture capital, Banks and financial services, academia, regulators)? What are the key networks of the ecosystem in your country (including online

networks, innovation hubs, forums, etc)? What are the national strategies, policies, laws and regulations (in place or preparation) related to blockchain?

The applications of blockchain technology/innovation are still very limited, yet the developments with respect to blockchain are monitored by many public and private sector actors. Blockchain Research Laboratory (BCLabs) was established in 2017 under the roof of BİLGEM UEKAE Mathematical and Computational Sciences in order to meet the needs of private and public sector and undertake the activities covering the infrastructure of blockchain technologies, their establishment, security, business models, crowd funding systems and other technical details.

Currently, most of the blockchain innovations are confined in the financial services sector. One of the most important actor that conduct and test blockchain technologies in Inter-banking Cart Center (Bankalararası Kart Merkezi- BKM). They established a blockchain application called “Keklik” with a mission statement of “Bye Bye Cash”.

Other associations that are recently established in order to undertake blockchain related research, application and awareness raising activities include Eurasia Blockchain and Digital Currency Research Association (BLASEA), Turkey Blockchain Association and T90 Turkey Blockchain Technology Association. Also, The Blockchain platform was established by the Turkey Informatics Association. This platform aims increasing awareness of blockchain technology and searching the benefits and prior strategies of this technology conducting various activities for these objectives.

Akbank, one of the leading private banks in Turkey, has been the first banking company who made a deal with a crypto currency, Ripple, in order to use in and speed up the international money transfers.

Besides these, some leading universities in Turkey, including Bosphorus University and Medipol University, have integrated blockchain into their course schedules and programs.

**On the Eleventh Development Plan (2019-2023) of Turkey;** blockchain based digital currency of central bank is stated to be put into practice. Also providing equal opportunities for firms benefiting from international best practices, supporting formation of a secure financial technology (Fintech) ecosystem and completion of the necessary legal and physical infrastructure works in transportation and customs services to promote and extend blockchain applications are other policies stated in the plan. The plan also states that process and technological infrastructure improvements will be made in order to benefit from new technologies such as big data, cloud computing, mobile platforms, internet of things, artificial intelligence, blockchain in the improvement of public services.<sup>1</sup>

Improvement of blockchain technologies in national level is stated also in **“2023 Turkey Industry and Technology Strategy”** plan. There are 5 strategic components in the strategic plan defined as the "National Technology Move". Under the title of "Infrastructure", "National Blockchain Infrastructure" is handled as a special section. In the published plan, the importance of blockchain technology is emphasized and national goals regarding the establishment of national blockchain infrastructure, creation of application development competence on blockchain technology and testing of new, secure business model and processes (supply chain, banking, legal tracking applications, etc.) are stated.<sup>2</sup>

**On Ankara Regional Innovation Strategy,** one of the key sectors of Ankara region is ICT. Under the ICT sector, some actions have been identified. These are ; spreading the block-chain applications.

**Regulations on Digital Identity Applications:** “Turkey continues with its legislative efforts on Digital ID and the developments in the world are closely followed. Digital identity applications in Turkey have found a legal base with the enactment of Republic of Turkey ID Card Directive published on April 11, 2016. In accordance with the descriptive article no 4(b) of the directive; “Biometric data: Refers to the personal data obtained from finger prints, vein prints and palm prints that are taken in order to perform identification and authentication through electronic

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<sup>1</sup> <https://www.kanunum.com/content/8617236#.X22A-clzaUj>

<sup>2</sup> <https://bctr.org/turkiyenin-2023-strateji-hedefleri-arasinda-ulusal-blockzincir-altyapisi-var-10702/>

systems". Thereby, it must be noted that the new citizenship IDs created in Turkey are digital identities within this context and this has been realized by a legal regulation." <sup>3</sup>

3. What are the challenges that your government have faced or may face for promoting innovation and competence building in blockchain in your country, to contribute to national development priorities and accelerate the progress towards the SDGs?

An important public application area for blockchain technologies is e-government services. In Turkey, the number, variety and scope of the e-government services have mounted. Yet, still public sector needs to advance especially in digital development and access to digital services and to increase the number of citizens who can easily access to these services. This can enable to integration of blockchain technologies in e-government services including national identification management systems, tax collection and monitoring systems, voting systems, secure financial services, health services, social support services, food security and supply chain management systems.

4. What are the actions that the international community, including the CSTD, can take to contribute to harnessing blockchain for sustainable development?

Such actions may include increasing digital literacy, increasing awareness of blockchain technologies and establishing local-regional partnerships for the development of diverse blockchain applications. Sharing global successful examples in regarding to usage of blockchain technology for sustainable development with countries that are late to integrate the technology to their innovation ecosystem will contribute to increase the awareness regarding the technology. Also international communities can execute complementary know-how transfer programs (including applied training programs or projects in executing transformation of a country's public service applications with blockchain technology) that allow engaging ecosystem actors with pioneer countries and less developed ecosystem owning countries.

5. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

- Blockchain Research Laboratory (BCLabs)
- Eurasia Blockchain and Digital Currency Research Association (BLASEA)
- Turkey Blockchain Association
- The Blockchain platform

6. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?

The Blockchain Turkey Platform (BCTR)'s reports can be considered as the pioneer studies both on the technological assessment of the use of blockchain in different sectors and future of the technology.

One of the main activities of the platform is considered to regularly bring various publications together with platform members and followers. In this context, research reports, books, assessments of the outcomes of the sectoral working groups' studies are continuously presented in Platform's website. Some of the reports mentioned are listed below:<sup>4</sup>

- [GLOSSARY STUDY FOR BLOCKCHAIN TECHNOLOGY JUNE 2019](#)
- [DIGITAL ID REPORT-2019](#)
- [BLOCKCHAIN REGULATIONS AND PRACTICES IN THE WORLD COMPARISON REPORT-2019](#)

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<sup>3</sup> ([https://bctr.org/dokumanlar/Blockchain\\_Regulations\\_in\\_the\\_World.pdf](https://bctr.org/dokumanlar/Blockchain_Regulations_in_the_World.pdf))

<sup>4</sup> <https://bctr.org/>

- CONCEPTUAL ARCHITECTURE FOR BLOCKCHAIN
- KNOW YOUR SUPPLIER PLATFORM
- VERGİ, MUHASEBE VE DENETİM AÇISINDAN KRİPTOPARALARIN İNCELENMESİ –TR  
(EXAMINATION OF CRYPTOCURRENCİES IN TERMS OF TAX, ACCOUNTING AND AUDIT)
- KRİPTOPARA VE ICO RAPORU-TR (CRYPTOCURRENCİES AND ICO REPORT)
- KİŞİSEL VERİLERİN KORUNMASI HUKUKU VE BLOKZİNCİRİ TEKNOLOJİSİ RAPORU-R  
(PROTECTION OF PERSONAL DATA AND BLOCKCHAIN TECHNOLOGY REPORT)
- AÇIK VERİ-TR (OPEN DATA)

#### **SOME START-UP'S OPERATING IN METU TECHNOPARK**

ARGEDOR BİLİŞİM TEKNOLOJİLERİ SAN. ve TİC. A.Ş. ARGEDOR BİLİŞİM TEKNOLOJİLERİ SAN.  
ve TİC. A.Ş.  
BLOK-Z BİLİŞİM TEKNOLOJİLERİ A.Ş.  
FAME KRİPTOSİSTEM TASARIM LTD. ŞTİ.  
KOBAKÜS BİLİŞİM TEKNOLOJİ A.Ş.  
NART BİLİŞİM HİZMETLERİ LTD. ŞTİ.  
PANACEA YAZILIM VE BİLGİ TEKNOLOJİLERİ A.Ş.  
PROJESİUM YAZILIM DONANIM DAN. TİC. LTD. ŞTİ.  
SİGUN BİLGİ TEKNOLOJİLERİ ve DAN. A.Ş.

Please send your responses and any further inputs on the theme to the CSTD secretariat ([stdev@unctad.org](mailto:stdev@unctad.org)) by 7 October 2020. We look forward to receiving your valuable inputs.

Sincere Regards,

CSTD secretariat