



## HARNESSING BLOCKCHAIN FOR SUSTAINABLE DEVELOPMENT



# AGENDA

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# The Blockchain Technology

## Cryptocurrency

The foundation of blockchain technologies

Cryptocurrency blockchains

Peer-to-peer decentralised cryptocurrency transactions

Proof-of-work (PoW) protocol

BLOCKCHAIN 1.0



## Smart Contracts

More financial functionality than simply being a cryptocurrency transactions processor

Decentralized applications (DApps) based on programmable language

Autonomously executing algorithms

Proof-of-work (PoW) protocol

BLOCKCHAIN 2.0



## More Functionality

Larger-scale of applications of non cryptocurrency-related Distributed Ledger Technology (DLT)

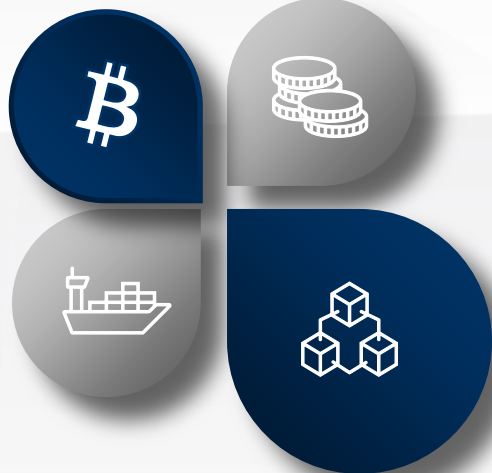
Improved performance with more scalability and interoperability.

Proof-of-stake (PoS) protocol

BLOCKCHAIN 3.0



# Blockchain's Applications



## Cryptocurrencies and online payments

At present there are about **1,000 cryptocurrencies**. The total capitalization of the 100 most valued cryptocurrencies was about USD 330 billion, in which Bitcoin accounted for USD 200 billion.

## International trade

**Smart contracts** allow for **automatic, speedy, and timely issuance of customs invoices, permits, licenses, and certificates triggered after payments of fees and duties**. Numerous companies and governments are already forming consortia and alliances to deploy the blockchain technology in various areas of international trade.

## Decentralized Finance (DeFi)

Blockchain-based financial instruments run by **smart contracts** that expand the use of blockchain from simple value transfer to more complex financial use cases without any intermediaries. In 2020 there were **251 DeFi projects**, 203 were built on Ethereum blockchain, and 26 on Bitcoin.

## Value chain

Blockchain can be used to improve the **transparency, traceability and reliability** throughout the value chains by reducing information asymmetries, tracking inventories and ownership rights of products, enabling faster and more cost-efficient delivery of goods, and enhancing coordination between stakeholders.

# Blockchain's Ecosystems of Innovation



# Examples of Blockchain Applications that Contribute to the SDGs

## SDG 2: Zero Hunger

**Food voucher transfers with blockchain:** Building Blocks is a blockchain-based voucher delivery platform created by WFP to simplify voucher transactions by removing the need to create virtual custodial accounts with financial services providers.

## SDG 8: Decent Work

**Access to interest-free loans using blockchain:** the Federal Tax Service (FTS) of the Russian Federation launched a blockchain platform named "MasterChain" to issue interest-free loans to SMEs processing their applications for interest-free loans for the payment of wages.



## SDG 7: Affordable and Clean Energy

**Blockchain-based solution for energy efficiency improvement:** In the Russian Federation a pilot project is launched to increase energy efficiency through blockchain use for electric power metering.

## SDG 13: Climate Action

**Low carbon tea project in Kenya (GLI-TEA):** The project deploys the blockchain technology to support the traceability and transparency of both production and emissions of the tea value chain.



# The Potential Impact of Blockchain on the Achievement of the SDGs

## Forward-looking scenarios



**Decentralized applications** overtake centralized ones



Applications are developed for **financial inclusion**



**Efficiency** increases in international digital transactions

**Cryptocurrency** replaces fiat money



Blockchain becomes the **“new Internet”**



# The Potential Impact of Blockchain on the Achievement of the SDGs

## Potential unintended consequences

### Environment impact

Bitcoin was using as much energy consumption as Switzerland

### Inequality

50% of all bitcoin addresses hold less than 0.01 bitcoin, and almost 90% hold less than 1 BTC

### Criminal activities

The share of illicit cryptocurrency rose in 2019 to reach 1.1 per cent of all activities (around USD 11 billion).

### Privacy

Hackers stole USD 450 million in Bitcoin in MtGox Bitcoin Exchange attack in 2014 and were not identified.





# Harnessing Blockchain for Sustainable Development



## Low and lower-middle-income developing countries

Build the basic human capacity and infrastructure, and start pilot projects, that could kickstart the diffusion of blockchain.



## Upper-middle-income countries

Facilitate the linkages of their national innovation system with the global ecosystem of innovation in blockchain to create opportunities for their firms to engage, contribute and benefit from the development of the technology and the rapid pace of innovation.



## High-income countries

Develop legal and policy frameworks that allow organizations and the public to benefit from Blockchain technology while minimizing its risks and protecting users.

# Harnessing Blockchain for Sustainable Development

Creating the regulatory environment for support blockchain innovation while addressing potential risks



## Privacy security and data protection



Concerned on the processing of personal data across geographical boundaries would be common practice.

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## Financial regulations



The absence of an international convention for regulating blockchain in financial markets, could potentially be problematic.

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## IP regulations

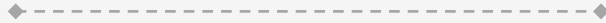


The relationship between blockchain and intellectual property (IP) rights can be viewed from two perspectives: from the developer end, and from the user end.

# International collaboration



Share knowledge and and research



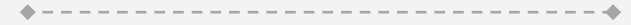
Build capacity of governments



Set guidelines, norms, and standards



Use blockchain in the UN operations



# Conclusions

## Key messages



- Blockchain has the potential contribute to **sustainable development**, but at this moment, innovation has focused on **financial applications**
- For most of the innovations in this field, the goal is **speculative gains in crypto-financial assets** → financial bubbles and bursts
- Blockchain may potentially increase **automation and the integration of physical and virtual worlds**.
- **Past technological revolutions** offered windows of opportunity for some developing countries to catch up and others to forge ahead.
- Governments of developing countries should seek to **strengthen their innovation systems** to strategically position themselves to benefit from this new wave of technological change.



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