Blockchain Technology is often seen through the "lens" of money.

Less discussed has been its potential to support environmental and social as well as economic development

One way to frame this discussion is by linking relevant blockchain applicatons to the United Nations' Sustainable Development Goals (SDGs)

English Publication
https://sustainabledevelopment.un.org/post2015/transformingourworld/publication
Chinese Translation
https://sustainabledevelopment.un.org/content/documents/94632030%20Agenda_Revised%20Chinese%20translation.pdf

Which blockchain characteristics can make it valuable for supporting the SDGs?

- **Immutable and verifiable transactions** can allow the elimination of paper

- **Automated (and immediate) reconciliation** can improve delivery and reduce costs, thus making some services more accessible for the poor

- **The tracing of digital assets through 100s or 1000s of transactions** can support the tracking of goods to prevent fraud and reward good practices

- **Immutable "original" electronic certificates, licenses and declarations can be linked with goods, services and people** in order to facilitate regulatory procedures and the disbursement of benefits

In different combinations , the above can result in new services and dramatically reduced costs

Today we will only look at some selected goals since there is not enough time to look at blockchain's impact on all 17 goals

1 NO POVERTY

TRUST 2019 可信区块链峰会

Globally, 1.7 billion adults have no bank account and no access to financial services

Financial services such as insurance, credit and low-cost international fund transfers can be life-changing

Blockchain financial services are based on:

1) Fast, reliable, low-cost operations (using automatic reconciliation and smart contracts)

2) Trustworthy external data coming from sources such as satellites, hospitals, mobile banking, etc.)

A few examples of financial services

- **Small farmer insurance against bad weather in Sri Lanka**

- **Insurance providing emergency accident care for motorcyclists in Kenya**

- **EU BEACON project to develop agricultural insurance using blockchain and satellite-data**

- **Provision of small, short term loans with interest rates of 1% to 2% to street food vendors in Kenya**

- **Credit histories for small farmers in Zimbabwe allowing them to obtain loans**

- **Credit histories for the poor for use in obtaining loans in Sierra Leon**

- **Inexpensive cross border remittances to families in Tajikistan and Serbia from workers abroad**

Links can be found in the Notes for this slide

Connecting consumers to producers and getting more income, faster, to commodity producers

An example: Coffee producers in Africa

Moyee Coffee, Bext360 and the Fairchain Foundation have implemented a project in Ethiopia which uses AI to automatically grade coffee and offer a price to farmers at the point of purchase. If a farmer accepts the price, they are paid immediately and the coffee and the price are registered on a blockchain.

As the coffee moves through the supply chain each step is registered, eventually allowing the consumer to see which farmer supplied their coffee and how much they were paid for it.

https://medium.com/@MoyeeCoffeeIRL/worlds-first-blockchain-coffee-project-cd04fff9e510
https://www.ibtimes.co.uk/blockchain-traceable-coffee-bext360-partners-africa-europe-north-america-1645350
https://fairchain.org/

The United Nations World Food Programme (WFP) uses blockchain technology to provide refugees from the Syrian conflict with a way to pay for their food which provides greater choice, greater security and greater privacy.

The project is called, 'Building blocks', and was started as a pilot in Jordan in 2017 and, as of September 2019, was serving over 100,000 Syrian refugees.

Refugees identify themselves with biometric data and while the blockchain is used for "bookkeeping", actual payments are made to shopkeepers or refugees in Jordanian currency by commercial financial service providers.

https://innovation.wfp.org/project/building-blocks

Benefits have included

- **Efficiency**: Bank fees reduction of 98%

- **Transparency**: Every single transaction is authenticated and recorded by WFP on a blockchain; WFP has real time knowledge of exactly how much it owes to each retailer at any given point in time. This can significantly improve accountability.

- **Security**: (lower financial risk) No funds are advanced to Financial Service Providers (FSPs) – in the past WFP needed to advance an entire month's distribution for a value of about USD 10 million to the FSP. Refugees do not have to worry about having their funds stolen, the use of biometric identification helping to ensure this.

- **Confidentiality**: No beneficiary data was shared outside WFP

Tracing food from "farm to fork" allows a quick identification of of the source of problems – Going from days/weeks to seconds

Quick product identification in a crisis can save lives. It can also result in dramatically reduced food losses, reduced fraud and reduced economic losses

The positive impacts from blockchain-based food tracing are so great that large international food retailers are implementing the technology in a big way

Example: Walmart China
In 2019 Walmart China launched a blockchain traceability platform for food with CCFA (China Chain-Store & Franchise Association), PwC, Inner Mongolia Kerchin Co. Ltd., and VeChain

During 2019 and the first part of 2020, Walmart China plans to increase the number of products traced using blockchain from 23 to 33, including fresh meat, rice, mushrooms and cooking oil. Walmart researchers believe that its new blockchain food traceability system will result in traceable fresh meat accounting for 50% of Walmart's total fresh meat sales and traceable vegetables accounting for 40% of total sales of packaged vegetables

https://cointelegraph.com/news/walmarts-foray-into-blockchain-how-is-the-technology-used

3 GOOD HEALTH AND WELL-BEING

By establishing cost effective: verification, traceability and access control, Blockchain creates opportunities in healthcare to support:

1. **Drug/Pharmaceutical traceability** to prevent fraud (10%-30% of drugs in developing countries are fake)

This use is also being driven by legislation: From February 2019, the EU's Falsified Medicines Directive requires all prescription medicines to come with a security feature for verification of their authenticity. The United States FDA's Drug Supply Chain Security Act outlines requirements to develop and enhance drug supply-chain security by 2023 and the Drug Supply Chain Security Act (DSCSA) regulations already require returned medicines to be authenticated. MediLedger is an example of an Industry consortium pharma tracing blockchain tool tailored to meet the U.S. requirements

2. **Data security in clinical trials** – to prevent fraud or bias

3. **Better patient data management**, including data from different providers and data from Internet-of-Things monitoring devices

Links can be found in the notes for this slide

Registering and verifying diplomas and qualifications

Falsification of educational diplomas is a serious problem. Some estimate up to 30% of educational qualifications are false. Blockchain solutions can help.

1) The United Arab Emirates has launched the "UAEU Passport," a blockchain application that helps students and alumni manage and share their academic records with complete digitization, flexibility, ownership, and security.

- https://www.uaeu.ac.ae/en/news/2019/feb/uaeu_passport.shtml
- https://edition.cnn.com/videos/tv/2018/06/28/blockhain-university-dubai-global-gateway.cnn/video/playlists/global-gateway/

2) "Diplomas" is one of four 2019 focus areas of the European Blockchain Services Infrastructure Initiative

- https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/EBSI
- https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/blockchain-now-and-tomorrow

"QualiChain" is an EU funded project that targets creation of a platform for storing, sharing and verifying education and employment as well as interfacing with private education, the labour market, public sector administrative procedures and others.

- https://qualichain-project.eu/

How? By:

1) Tracking the origin of energy (Renewable Energy Certificates)
https://www.energyweb.org/2019/09/19/blockchain-teo-the-energy-origin-is-the-first-application-to-migrate-onto-the-energy-web-chain/

2) Supporting investment in clean energy projects by individuals
https://thesunexchange.com

3) Managing demand response and adjustments to local conditions (such as changes in wind or sunlight) with real time price setting based on pre-set rules and user preferences
https://rmi.org/blockchain-reimagining-rules-game-energy-sector/

Helping make Sustainable Energy for All (SE4ALL) a reality

Combined with renewable energy and the Internet of Things (e.g. smart metres), blockchain could speed up access to electricity for 1 billion people still living without it (World Energy Outlook, 2018)

Microgrids allow rural communities to produce their own electricity, keep profits, and even provide back-up energy to the main grid.

https://webstore.iea.org/world-energy-outlook
https://www.me-solshare.com/

Blockchains can provide efficient real-time management of micro-grids and peer to peer energy trading, making them economically feasible

https://www2.deloitte.com/ch/en/pages/energy-and-resources/articles/will-microgrids-transform-the-marke.html
https://www.smart-energy.com/industry-sectors/business-finance-regulation/bringing-the-blockchain-microgrid-to-life/
https://www.csis.org/blockchain-and-aggregating-microgrid-projects-developing-nations

AND can make possible new payment mechanisms for microgrids such as the mobile payment system M-PAYGO

http://www.mpayg.com/
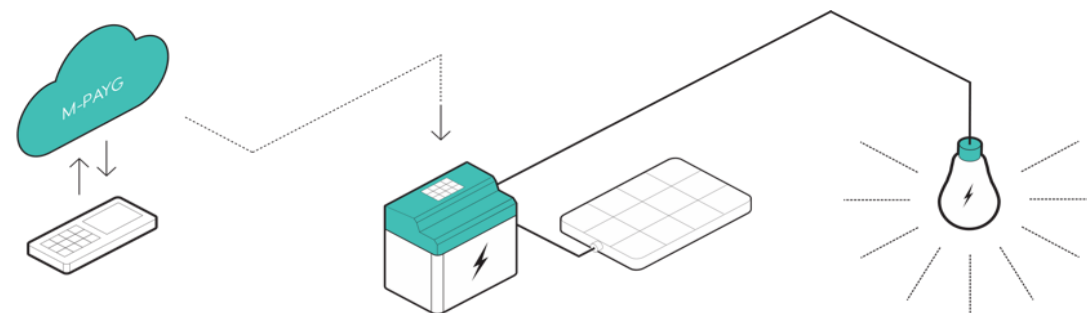
According to the ILO, 25 million people currently work under forced-labor conditions worldwide

The U.S. State Department, jointly with CocaCola and the tech company The Bitfury Group, has initiated a blockchain project to create a secure registry for workers' legal status and their contracts. This is expected to aid in the fight against forced labour in global value chains

https://www.digitaltrends.com/cool-tech/coca-cola-blockchain-forced-labor/

In Brazil, a not-for-profit organization, Alinha, has launched a programme using blockchain technology to certify and label garments in order to show that they have not been made using forced labor

https://cointelegraph.com/news/brazilian-non-profit-tags-clothes-for-workplace-abuse-using-blockchain

The World Bank has supported Kenya in the development of a mobile phone-based bond issuance project called 'M-Akiba', which uses Blockchain technology to simplify the platforms used for the issuance and sale of bonds to raise money for infrastructure

'M-Akiba' allows users to purchase government bonds in small amounts, without the need for a bank account, with transactions ranging from US$30 to US$140. It is marketed under the slogan, **"Save Money. Make Money. Build Kenya"**

The pilot phase of this mobile-only government bond platform was launched in March 2017, for US$1.5 million. After the first week of the pilot launch, 40,000 users had registered on the platform

http://www.m-akiba.go.ke/
https://www.standardmedia.co.ke/business/article/2001338719/treasury-makes-third-stab-at-m-akiba-bond
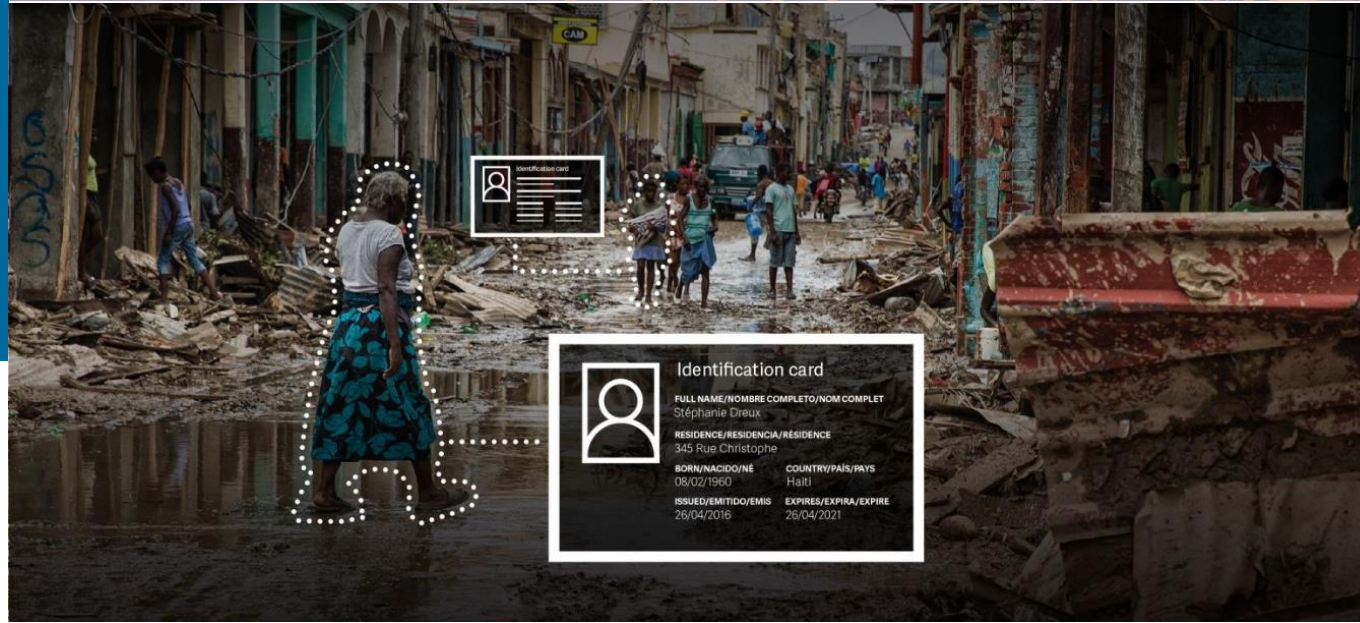
Helping Consumers Make Informed Choices

Many companies and organizations are using, or are planning to use, blockchain technology to trace certified goods throughout supply chains so that the consumer can be sure that the goods they purchase are as advertised (bio, organic, free from pesticides/harmful chemicals, legally harvested, etc.)

1) Based on recommendations from an earlier study, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is working with the OECD, a fashion brand (Hugo Boss) and several other organizations in an EU funded project to identify and/or develop the necessary standards and implement a blockchain proof of concept for tracing organic cotton from the farm to the consumer.
http://www.unece.org/fileadmin/DAM/trade/Publications/ECE-TRADE-439E-TEXTILE4SDG12.pdf (document page 7 and Page 11, Recommendation 7)

2) A Swiss food company, Gustav Gerig AG, was the first European food importer to make the supply chain of its canned tuna fully traceable using blockchain technology and now include the Pacifical logo on the traceable can lids of the "Raimond Freres" brand.
https://www.newsbtc.com/2018/11/28/swiss-brand-to-become-first-european-country-to-trace-tuna-on-the-blockchain/

Supporting the right to a legal identity

The right to a legal identity is a universal human right. One indicator for this SDG requires all countries to ensure that everyone has a legal form of identity by 2030.

Over 1 billion people worldwide are unable to prove their identity through any recognized means. As such, they are without the protection of law, and are unable to access basic services (healthcare, education, etc), participate as a citizen, or transact in the modern economy. Most of those affected are children and adolescents, and many are refugees, forcibly displaced, or stateless persons

https://blockchain4sdg.com/digital-identity-sdg-16-9-providing-legal-identity-for-all/#_ftn1

Supporting the right to a legal identity

Digital identity is one solution, but it also carries significant risk if not thoughtfully designed and carefully implemented. We should not underestimate the risks of data misuse and abuse, particularly when digital identity systems are designed as large, centralized databases. Blockchain technology has the possibility to support systems that avoid many of these risks.

One organization trying to address these issues is **the ID2020 Alliance** which is a public-private partnership committed to improving lives through digital identity. The Alliance brings together multinational institutions, nonprofits, philanthropy, business, and governments.
They work **to set technical standards and fund high-impact pilot projects that bring digital identity to vulnerable populations, and use the data generated to find scalable solutions and inform public policy**. Partners include Accenture, FHI360, Gavi, the Vaccine Alliance, Hyperledger, IDEO.org, iRespond, Kiva, Mercy Corps, Microsoft, Simprints, and United Nations ICC.

https://www.unhcr.org/blogs/announcing-the-2018-id2020-summit-towards-good-digital-identity/
https://id2020.org/
https://everest.org/#the-project
https://www.irespond.org/our-solution/

Efficient trade and transportation services generate employment and wealth, support economic development and, through these, human well-being.

The use of Blockchain in trade is blossoming and there are many existing and planned applications, ranging from the exchange of blockchain "notarized" documents such as bills of lading to the tracking of containers to the mutual recognition (by countries) of companies that qualify for expedited customs procedures (Authorized Economic Operators).

Good sources for information on the use of blockchain to support trade are:

1) ***Can Blockchain Revolutionize Trade?***, a World Trade Organization (WTO) publication
https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf

2) ***Blockchain in Trade Facilitation: Sectoral challenges and examples***
A publication of the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)
http://www.unece.org/fileadmin/DAM/cefact/cf_plenary/2019_plenary/CEFACT_2019_INF03.pdf

3) ***White Paper Overview of Blockchain for Trade (basic introduction)***
A publication of the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)
http://www.unece.org/fileadmin/DAM/cefact/GuidanceMaterials/WhitePaperBlockchain.pdf

For More Information about Blockchain and the SDGs

Publication
- ***Briefing note on Blockchain for SDGs***
  http://www.unece.org/fileadmin/DAM/cefact/cf_plenary/2018_plenary/ECE_TRADE_C_CEFACT_2018_25E.pdf

Web Sites on Blockchain and the SDGs

- https://feature.undp.org/beyond-bitcoin/

- https://blockchain4sdg.com/about/

Articles

- https://medium.com/hackernoon/blockchain-and-the-sustainable-development-goals-c51c52e0af28

- https://www.diginex.com/insights/four-fundamentals-to-address-sustainable-development-goals-with-blockchain/

Please feel free to contact me with any questions

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