Blockchain in the Public-Sector

Virginia Cram-Martos
Triangularity SàRL

Government Services Often Require

- **The Delivery of Trusted and Authentic Information**

- **The Creation or Collection of Trusted and Authentic Information**

- **The Protection of Private Information**

Trusted and Authentic Information - Delivery

Today
- Paper
- Databases (centralized and run by trusted third-parties)

Tomorrow
- Databases + Blockchain
- Databases
- Blockchain
- Blockchain and IPFS
- Blockchain and Paper linked via QR codes
- Paper

Trusted and Authentic Information - Collection

The information needed for delivering government services often comes from a range of sources including:

- Multiple government agencies
- Different levels of government (federal, provincial, municipal)
- Semi-public or private organizations
- Citizens themselves

As a result, governments collect and copy information which is prone to errors and communication problems.

Blockchain can be a cost effective way to create a secure source of shared data to replace multiple, centralized information silos.

Trusted and Authentic Information - Collection

For Blockchain applications

Data quality is extremely important. So a great deal of attention must be given to the process of adding data as well as the establishment of any initial baseline data.

Otherwise,

Garbage in, Garbage forever!

Blockchain Data Quality

Remember:

While blockchains may be immutable and very transparent (you can see everything that was written and which "address" outside the blockchain made the change)

The correctness of blockchain data depends upon the quality of the EXTERNAL process(es) which decide what data can be written to the blockchain

Trusted and Authentic Information - Collection

In Government Blockchain Applications,

Data Quality is a

HUMAN RIGHTS ISSUE

Because data in a blockchain may decide what a citizen

- Legally owns
- The services and benefits they are entitled to
- The profesional activities they can undertake
- etc. etc.

Common Use Cases

- Identity (persons and legal entities)
- Official documents (licenses, diplomas, taxes paid, etc.) issuance and related reconciliations
- Property registration (Land Registries, Cadastres)
- Government asset monitoring and management
- Government financing
- Voting and citizen consultations
- In some cases: energy grid management
- In some cases: healthcare monitoring and management

Finance
M-Akiba in Kenya

M-Akiba is a retail bond issued by the Kenyan Government via a mobile phone platform. Akiba is Swahili for savings. Hence, M-Akiba stands for Mobile Savings.

- **Among the objectives of M-Akiba are to:**
    - **Enhance financial inclusion for economic development**
    - **Provide greater access & democratization of sovereign debt**
    - **Provide funding for Government infrastructural development projects;**
    - **Promote a savings and investment culture**

- **Account creation takes under 10 minutes as opposed to 3 – 21 days. The minimum investment is reduced to KES 3,000 i.e. approx. USD 30 or 25 Euros**

- **Purchasers receive interest monthly and can sell anytime via a blockchain**

Blockchain and smart contracts allow the government to cost-effectively management such a large number of small accounts and payments.
http://www.m-akiba.go.ke/

The World Bank issued a Blockchain Bond in August 2018, raising 110 million USD

https://www.worldbank.org/en/news/press-release/2018/08/23/world-bank-prices-first-global-blockchain-bond-raising-a110-million

Identity – Building Blocks World Food Program (WFP)

One of the largest deployed Blockchain identity applications is the WFP's "Building Blocks"

In January 2016, 106,000 Syrian refugees were redeeming WFP cash transfers on a blockchain-based system and more than US$ 23.5 million had been transferred to refugees through 1.1 million transactions. By March 2019, an additional 400,000 refugees were expected to be enrolled.

Identity – Building Blocks World Food Program (WFP)

The Building Blocks programme improves WFP's services' transparency, efficiency, security, and speed.

Before, families could wait days for transfers from local banks, and their personal information was vulnerable at those institutions. Now, refugees' data (including biometric info.) is encrypted and vouchers are transferred to refugees almost instantaneously once they register.

For WFP, another benefit has been saving 98 % of bank transaction fees.

https://foodtank.com/news/2019/01/the-world-food-program-fighting-hunger-with-blockchain/

rean Customs Service (KCS) is developing an AI-based X-ray
ne and blockchain system in 2019 and will be implementing it in
cond half of the year.

ockchain technology will enable e-commerce companies and
ortation companies to share information on orders and
ortation of goods in real time.

-based X-ray analysis equipment will determine the accuracy of
ormation – that is, whether the information provided matches
tual products.

https://tokenpost.com/Korea-Customs-Service-seeks-to-implement-blockchain-and-AI-987

Korea Customs Service is also developing a blockchain platform for international shipments which will share export documents from different parties such as customs declarations and delivery forms. The project's objective is to "fundamentally block document forgery," as well to reduce by 20% the cost of the export process.

The Customs document project is one of 6 announced in 2018 by the Korean Ministry of Science and ICT as part of a $9 million public-sector blockchain development strategy. Other projects are focusing on

- Livestock supply chain management,

- Online voting,

- Real estate transactions,

- Cross-border e-document distribution and

- Shipping logistics.

https://www.coindesk.com/korea-taps-samsungs-blockchain-tech-to-fight-customs-fraud
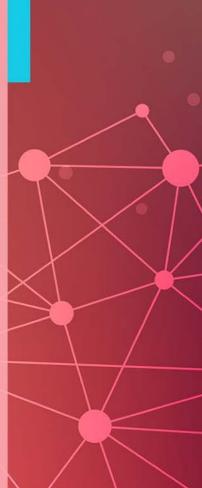https://www.coindesk.com/korean-government-lead-6-blockchain-pilots-9-million-fund

The Australian Government and Blockchain

In March 2019 the Australian Government announced a strategy for advancing its **"blockchain industry"**

Among a range of Australian government related projects has been
- Investigations by their Digital Transformation Agency on the benefits of using blockchain for government payments and
- Work with the Commonwealth Scientific and Industrial Research OrganIzation (CSIRO) to trial a blockchain-powered application that uses smart contracts to distribute disability insurance payments, reducing the risk of disability insurance fraud and reportedly saving the recipient and/or their caregiver 1 to 15 hours per week in paperwork

https://www.ethnews.com/australia-unveils-blockchain-project-plans-and-government-funding
https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/advancing-australias-blockchain-industry

- Free Trade Agreements between countries require that a Certificate of Origin accompany every shipment in order to apply a reduced duty rate.

- Today, most Certificates of Origin are paper documents that are slow and expensive to produce and process

- Electronically verifiable digital origin evidence would help streamline the process, reduce costs and reduce compliance issues at the border.

- But any digital solution needs to address the issues of digital trust, mutual recognition, data sovereignty, auditability and traceability.

- A potential solution could be the use of Blockchain technology.

https://uncefact.unece.org/display/uncefactpublic/Cross+border+Inter-ledger+exchange+for+Preferential+CoO+using+Blockchain

Project Deliverables are:

1: Business Requirements Specifications/Requirements specifications mapping or equivalent for preferential digital certificate of origin

2: Guidance material on exchange of digital certificate of origin and invoice declaration of origin over a cross border distributed ledger platform

3: Reference implementation of the cross-border inter ledger platform (at least 3 countries have indicated interest in participating)

https://uncefact.unece.org/display/uncefactpublic/Cross+border+Inter-ledger+exchange+for+Preferential+CoO+using+Blockchain

Blockchain and IoT *project to enable lamp posts, with sensors and connected to a blockchain, to independently send out repair orders and make payments after a repair is completed. This is being implemented - a proof of concept was done in 2017*

Benefits: *1) immediate reports of broken street lighting 2)Much shorter time and much less administration for processing repair orders 3) Because maintenance work is offered on an online platform in a transparent way, all qualified companies (including SMEs) that meet certain criteria will be eligible for repair work.*

Identity-related
- Registration of birth certificates - Tykn (prototype)
- Registration of degrees / certificates (education) - City of Antwerp, Ministry of Interior, Ministry of Education, SIDN Foundation (prototype)

Supply chain and transport
- Transfer of ownership in logistical processes - Port of Rotterdam (prototype)
- Permits for transnational transport - Human environment and transport inspectorate, Ministry of Infrastructure (prototype)

Real estate
- Registration lease contracts - City of Antwerp (prototype)

Healthcare
- Authorisations in healthcare processes - Healthcare Institute (prototype)
- Personal Healthcare budgets - City of Amsterdam (prototype)
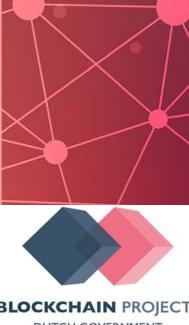- Medical results - Utrecht Medical Center (prototype)

BLOCKCHAIN PROJECTS
DUTCH GOVERNMENT

Finance
- Subsidies - City of The Hague / City of Schiedam / City of Amsterdam (prototype)
- Debt assistance - City of Schiedam / City of Utrecht (prototypes)
- Securities - City of Haarlem (prototype)
- Settlements within a single organization - Municipality of Drechtsteden (prototype)
- **Child allowances - City of Zuidhorn (In production)**

Other
- Decentralized energy exchange - City of Amsterdam (prototype)
- Elections - Five municipalities (prototype

BLOCKCHAIN PROJECTS
DUTCH GOVERNMENT

Governments provide services that allow their citizens to fulfill their human potential

Therefore
the design and implementation of effective and efficient services is not just a question of making the best use of taxes

Governments provide services that allow their citizens to fulfill their human potential

Blockchain can free up resources for public services due to reduced fraud and more efficient service delivery

So it is important that developing countries have the tools available to implement blockchain in public services
Including open-source, free standards for interoperability

Failing to ensure that this happens will not just widen the information technology gap

It will widen the gap between developed and developing countries in all areas of human development

It is an opportunity to create a better future for them

Un Grand Merci!

Virginia Cram-Martos

crammartos@triangularity.net

For This to Happen

We need interoperability based on open standards that are free for all

- Standardized semantic content (so we understand what we are trying to say to one another)

- Standardized Application Program Interfaces (APIs)

- Common understandings of processes (using standardized modelling tools) so that "smart contracts" can better interact