The Blockchain for Sustainable IMPACT Investment


https://ixo.world
My name is Herman Smith, I am a Software Developer who believes we can change the world through the innovative and appropriate use of technology.

AND I BELIEVE THERE HASN’T BEEN A MORE URGENT TIME FOR US TO CHANGE THE WORLD THAN RIGHT NOW!!!

Currently I work as a Software Developer for the SQN Way, a startup looking to disrupt the "state of human capital" in large organizations through the application of datascience in driving behavioural change at scale. Do you know that on average large organizations coast along whilst only getting approximately 33%(sic) out of their biggest asset (their people). Would you be happy with only getting 33% out of your biggest asset? That is like living in a 3 bedroom home and only using one bedroom (and boarding up the rest)

BUT THAT IS NOT WHAT THIS CHAT IS ABOUT! :)

Blockchain for good

We can change the world through the innovative and appropriate use of technology …
Can I please by a show of hands see:
1.) How many of you are developers?
2.) How many of you have dabbled in blockchain, written smart contracts / DApps / Some other integration
Component-based architecture which has the goal of driving reuse across the technology portfolio within an organisation. These components need to be loosely coupled, and can be services or libraries which are centrally governed and require an organisation to use a single technology stack to maximise reusability.

Microservices:
The implementation of a specific business function, delivered as a separate deployable artefact, using queuing or a RESTful (JSON) interface, which can be written in any language, and that leverages a continuous delivery pipeline.

During one’s tenure in the software field one sees several technologies / approaches arrive on the scene with great promise, only to be relegated as “deprecated” surprisingly quickly.

Although SOA did lead to a fundamentally different POV in how platforms are architected in many ways paved the way for what we today almost take for granted in a world where Micro Services are the order of the day ...
In 2008 Satoshi Nakamoto turned the world upside down when he released his white-paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System". Among many things, Bitcoin introduced the world to blockchain technology. Ever since then, the floodgates have opened, blockchain technology has been adopted by some of the biggest companies in the world and is suitable to be applied to some of our most pressing concerns.

And in my opinion there are VERY few industries / systems that will not likely adopt an aspect of Blockchain in the next couple of years.
But more promising Blockchain technology is the key to enable trust at scale, enabling individuals to help themselves and break free from centralised authorities acting like dams in an intricate network of rivers & streams...
The Internet changed the way we communicate, Blockchain will change the way we trust...

The majority of people incorrectly perceive blockchain and bitcoin / crypto to be one and the same thing.

Which of course they are not, value exchange / currency was really just the first area in which this new trust-“less” distributed technology was applied.

[OPTIONAL]
In a “centralized” system, we trust a single third party (e.g. Chase Bank) to act as the intermediary who guarantees that funds exist and are transferred; in a blockchain based decentralised system, our trust is placed elsewhere, namely in public-key cryptography and a “consensus mechanism” that allows us to determine the truth.
Impact investing refers to investments “made into companies, organisations, and funds with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return.”

In essence it can be seen as the process of putting your money to work in such a way that it helps to achieve something positive for society. That can include a growing list of activities including access to education, energy, water or healthcare; affordable housing; renewable energy; and micro-finance.
Impact investing

All of us — business leaders, employees, pension savers, investors, entrepreneurs, governments, philanthropists, consumers, citizens — will place impact at the core of our decisions and actions, to create a world that works. A world of sustainable shared prosperity, and of social and environmental progress.

— Sir Ronald Cohen, 2018

"the father of British venture capital"

According to Bloomberg

Sustainable investing has gone from a niche investment idea to attracting enough capital to start having an impact on global challenges at a meaningful scale.

Nearly nine in 10 (87%) U.S. consumers say they will purchase a product because of a company’s stance on an issue they care about, and 78% say they want companies to address important social issues.

Among millennials, this is even more pronounced. A Bloomberg survey on individual investors found that millennials are more than twice as likely as other generations to purchase products from companies they view as sustainable.
Elaborate upon the various technologies “coming of age” to make ixo possible.
The **Problem**: Not knowing the impacts on sustainability

- Ineffective measurement, verification & financing technologies
  - Costs too much
    Manual & reliant on intermediaries
    At least 5-7% of capital allocation is spent on routine measurement, verification & reporting.
    In some known cases up to as much as 30% not going towards the actual outcome.
  - Takes too long
    Slow & asynchronous processes
  - Wastes resources & opportunities
    Capital is blocked & unproductive
  - Not scalable
    Distribution is centralised and distorted
  - Poor information
    Untrusted, low-value, trapped data
The Solution: Knowing with Proof of Impact

A new paradigm for data verification & capital liquidity using Web 3.0

- Lower costs
  Disintermediation & automation
- Faster proofing & production
  Digital claims processing & asset creation
- Optimized resources
  Programmable capital & smart applications
- Rapid scaling
  Decentralized networks & marketplaces
- Rich data
  Digital assets with identity & provenance
WHY NOW? 

Data Revolution

- Web 3.0 (decentralised) protocols
- Blockchain mechanisms
- Pervasive Sensors
- Machine Intelligence
- Data Marketplaces
- Shared Info-structure
- Tokenization
- 5G Wi-Fi / LoraWAN / Sigfox
- Digital currency
- Programmable Capital

"Achieving the Sustainable Development Goals demands embracing the data revolution"
UN Secretary-General, 2015

New tech made the solution possible
Details of how we solved the problem
Ixo has several moving parts …
For any agent (human or bot) to interact with the ixo blockchain they need to be in possession of a DID “legistered” on the chain.

Legistration is a term we informally came up with at ixo. It is a made up word combining Ledgering & Registration GETTIT! :) :) :) Legistration LOL!

To be registered means to write their DID to our blockchain enabling further interaction to take place from ixo having the ability to verify that further payloads have been cryptographically signed with the private key pair correlating to the public key that the BC has associated to the DID.
ixo Key Safe is your connection to the ixo blockchain.

The extension injects the ixo blockchain API into every website's javascript context, so that dapps can read from the blockchain. It is a secure identity vault that stores your identity with public and private keys.

A Sovrin DID (Decentralized Identifier) is also generated and ledgered onto the ixo blockchain, allowing all interaction with the ixo blockchain to be encrypted and protected.

Applications can interact with the ixo Keysafe and request a user to cryptographically sign documents using the stored private key. This is performed in a secure interface to review the document before approving or rejecting it.
In my opinion if you take one concept with you from this talk it is that DID's and the possibilities they provide relating to verifiable claims are the future and how all authentication systems will work in the future...

What is a DID?

At a superficial level, a decentralised identifier (DID) is simply a new type of globally unique identifier with special features designed for blockchains. But at a deeper level, DIDs are actually the tip of the iceberg -- or the tip of the spear -- of an entirely new layer of decentralised digital identity and public key infrastructure (PKI) for the Internet. This decentralized public key infrastructure (DPKI) could have as much impact on global cybersecurity and cyber privacy as the development of the SSL/TLS protocol for encrypted Web traffic (now the largest PKI in the world).

In traditional system design a user needs to be registered with you or alternatively a trusted third party and subsequently is able to authenticate with either a username & password or a token from the trusted 3rd party.

In DID based distributed systems this is accomplished by the user signing a designated piece of data with their private key that only they have. For this to happen on ixo the user needs to be "Legistered".
What is the credential array used for again? (Go through Cosmos docs to find out)
DID : Decentralized IDentifier

DID document:

didDoc:
  
  "did": "did:sov:Cn1tvutfUmjKQsKK8HUc6T",
  "pubKey": "7RGTwPxbH6kbeLByNMPgsZNeOYcveBNVGH4PMAASl",
  "credentials": []

Signed DID doc:

payload:

  type: "did/AddDid",
  value: {
    didDoc: {
      "did": "did:sov:Cn1tvutfUmjKQsKK8HUc6T",
      "pubKey": "7RGTwPxbH6kbeLByNMPgsZNeOYcveBNVGH4PMAASl",
      "credentials": []
    }
  }

  signatures: [{
    signatureValue: "+J+MLH1v59QQh4RSc5dMlEAzgFPC5SvYKwlw3j5so3QzWAr4qTfOq44I6hBwWeBLs0GDOe",
    created: "2019-07-11T16:37:15Z"
  }]
All interactions with the blockchain are signed in a similar way which allows the chain to verify whether the entity providing the signature (payload hash) is in possession of the private key correlating with the known public key.

Of course in the case of the ledgering call the public key used in the correlation step is actually extracted from the DID document (which is part of the payload) opposed to subsequent calls where it is looked up by means of the DID.
ixo : Ledgistration with the Key Safe

The new world of IMPACT

Where we count what matters and value what counts, using new Web 3.0 processes and the ixo-ledger.

Click here to become a pioneer now.
Platform Features

- **Launch a project**
  Provides you with a complete project data management solution in a container that you own, suitable for all sizes of projects.
- **Deliver Services**
  Work on projects or manage agent roles, using digital identity credentials.
- **Verify results**
  Know whether projects are delivering results, by verifying claims, with crypto-economic proof.
- **Invest for Impact**
  Raise capital & finance projects through tokenised investment applications.
- **Build applications**
  Configure customisations or create new solutions using standard protocols, shared data & network infrastructure.
- **Share data**
  Find and share verified datasets within a decentralised marketplace that provides incentives & built-in control mechanisms.

**Investment detail:**
Fund projects to achieve results, using programmable capital.
Implement financing innovations, such as smart impact bonds.
See integrated reporting on financial & development results.
Automate agreements and efficiently resolve disputes, with smart contracts.
Build and invest in tokenized investment portfolios.
Provide incentives to achieve innovation breakthroughs.
Getting started

Jodie has been living on the Cape Sinclair farm since 1993. The Franco family purchased a 25-hectare farm nestled in the beautiful and peaceful Cape Valley near Malmesbury and named it Sinclair Farm.

In effort to eradicate alien invasive plants on the open farm lands, Jodie has made it her mission to setup a project to reduce the growth of the plants in the near future while the family continue to farm and regularly produce organic and nutritionally rich foods for the local markets. She hopes that this is a start of something big for all the farms in the area.

Jodie Franco
PROJECT OWNER
Farm owner - Cape Sinclair
WEST COAST

Launch a project:
Use personas to tell explain the ixo flow. Use real people for viewers to identify with.
Diagram features various elements used during the part of the user journey.
Introduction of DID
DID: Decentralized Identifier

Self-Sovereign Identifiers

Common Standard Global Classifiers

DID: A3S12X41BZ3X1S9

SOVRIN: schema.org/person

Detail of DID in context to flow
Features not shows on videos:
Start with a project template, or create your own.
Sam Smith is the owner of SA Tree Felling, who specialise in care and maintenance of old trees. He is well know in the Cape areas for plot clearing, alien control and big tree felling jobs. The company also has qualified arborists that assist with disease diagnosis, hazard assessments and consultancies around preservation of trees on construction sites.

Sam is passionate about the work he does and always goes the extra mile. It is his life long dream to eradicate alien invasive plants. He believes this will lead to reduction in water usage and help aid in the water crisis that the Cape is currently faced with.

Deliver Services:
Bid and work on projects, in a peer-to-peer marketplace.
Make claims, using apps and connected devices.
Prove your credentials and reputation, with self-sovereign identity.
Receive automated digital payments for your services.
Use your own personal data to track your performance.
Improve performance through immediate feedback.
Step 1: BROWSING

Step 2: APPLICATION

Step 3: SUBMIT CLAIM

Service provider
SAM SMITH

IXO WEB PORTAL
IXO WEB API
ixo-cosmos
IXO BLOCKCHAIN
PROJECT DATA STORE
IXO EXPLORER
Ledger the request
Sync blocks to network state
IXO KEYSAFE
Sign request
Submit signed request
Query latest state of blockchain
Getting started

Katie has a Doctorate in Ecology and Conservation Biology (UCT). Her PhD focused on conservation planning and implementation processes (particularly conservation stewardship mechanisms) in highly threatened and biodiverse Cape lowland landscapes.

She has been closely involved with UCT in the Basic Environmental Impact Assessments, biodiversity pre-scans of potential development areas and managing environmental impacts on construction sites. Prior to this she worked with the Botanical Society of South Africa and as an independent environmental consultant advising on and managing projects for organisations in the non-governmental and government sector in South Africa.

Verify Results.
Evaluation can be done by humans or oracles:

- Use next-generation measurement, verification and reporting tools.
- Receive automated payments for evaluating claims.
- Participate in a global verification marketplace.
- Build powerful verification oracles, using cognitive computing.
- Access shared datasets for advanced analytics.
- Generate valuable digital information assets that can be tokenised.
What it looks like on the project.
Project owner dashboard:

Collect, process & store project data, under your control.
Decide who has access, using digital identity credentials.
Employ service providers & verification oracles, with automated payment triggers.
Fund a project with ixo tokens (not shown in design)
View performance in real-time on project dashboards.
Explanation of verification process.
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Build detail:
Configure projects & workflows using shared libraries & developer tools.
Rapidly deploy customized apps on an open infrastructure.
Plug into the Ethereum Decentralised Application solution space.
Integrate with other services (including legacy systems) through web APIs.
Extend core SDKs and contribute to the ixo open-source.
Offer new product solutions into the ixo ecosystem.
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Share detail:
Use new web standards for collecting, verifying and sharing claims data.
Get high-resolution data, using new decentralized digital identifier standards.
Incentivise data-sharing and decentralize data governance.
Build federated learning & AI for Good applications.
Break down data silos and benefit from a shared data commons for development.
Offer data services through decentralised marketplaces in the ixo ecosystem.
Provide incentives to achieve innovation breakthroughs.
Traditionally value has been largely determined purely by market factors (supply and demand)

With time series crypto economic proof data intrinsic value can be determined as opposed to the traditional extrinsic value.

This allows factors such as potential habitat destruction and O2 production loss into account.

Tokens are potentially a new asset class for the Impact Economy
A project that is currently being run through ixo is the Seneca Park Zoo Madagascar reforestation project.

How it works is that a portion of the funds raised at one of the attractions at the Seneca Park Zoo in upstate New York is used to impact invest in a reforestation project in Madagascar.

Initially a foliage LiDAR coverage map was produced of the island by means of drones carrying light sensors.

Then the impact funds invested in the project was used to plant trees and installing IOT devices measuring CO2 levels.

The idea is that over time more foliage LiDAR maps can be produced in conjunction with readings from the IOT sensors in the field allowing verifiable impact data to be produced.
Example of IOT device encompassing a Soilwatch (Soil Moisture Sensor) as well as CO2 sensor which is used in harvesting impact data over time.
Think globally act locally
Guided by the UN framework of 17 Global Goals to end poverty, protect the planet and ensure prosperity for all, by the year 2030.

Implementation of the SDGs started worldwide in 2016.

This process can also be called "Localising the SDGs".

All over the planet, individual people, universities, governments and institutions and organisations of all kinds work on several goals at the same time.

In each country, governments must translate the goals into national legislation, develop a plan of action, establish budgets and at the same time be open to and actively search for partners. Poor countries need the support of rich countries and coordination at the international level is crucial.
Thank you
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Cyberconflict: A new era of war, sabotage, and fear

David Sanger
The New York Times

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