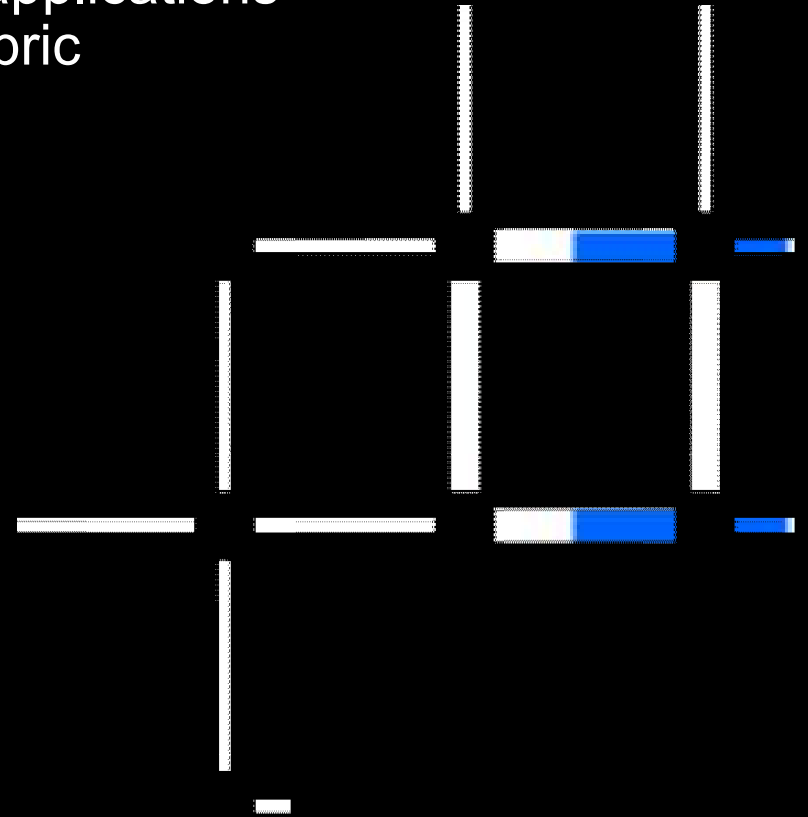


Building Blockchain applications using Java

Use your existing Java skills to develop Blockchain applications
on the IBM Blockchain Platform and Hyperledger Fabric

stone



er 2018

Blockchain

Business networks, wealth and markets

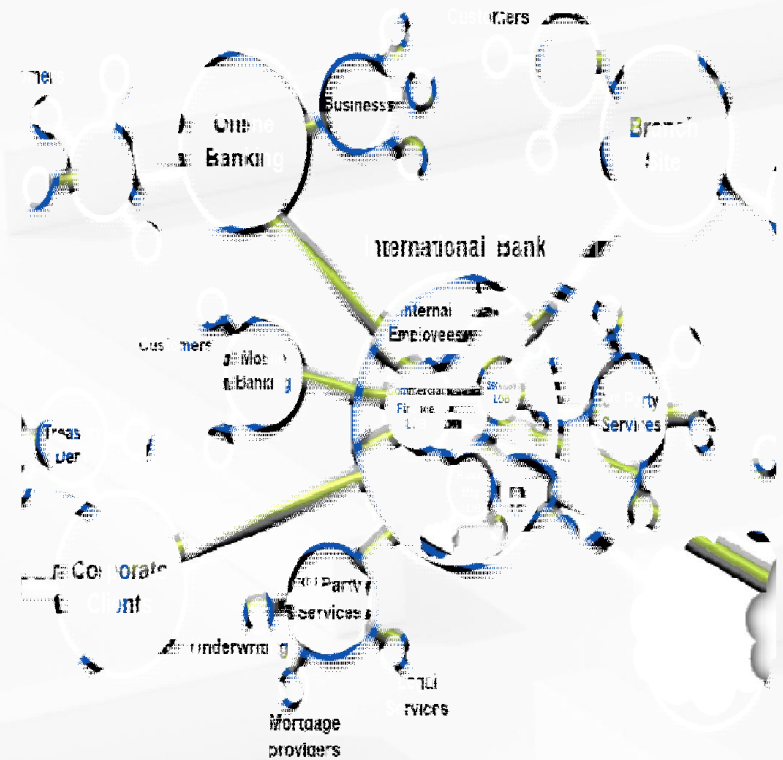
Business Networks benefit from connectivity

- Participants are customers, suppliers, banks, partners
- Cross geography and regulatory boundary

Wealth is generated by the flow of goods and services across business network in transactions and contracts

Markets are central to this process:

- Public (fruit market, car auction), or
- Private (supply chain financing, bonds)



Blockchain

Transferring assets, building value

Anything that is capable of being owned or controlled to produce value, is an asset



Two fundamental types of asset

- Tangible, e.g. a house
- Intangible, e.g. a mortgage

Intangible assets subdivide

- Financial, e.g. bond
- Intellectual, e.g. patents
- Digital, e.g. music

Cash is also an asset

- Has property of anonymity

Ledgers are key

Ledgers are THE system of record for a business. Companies will have multiple ledgers for the multiple blockchains networks in which they participate.

Transaction: an asset transfer onto or off the ledger
John gives a car to Anthony (simple)

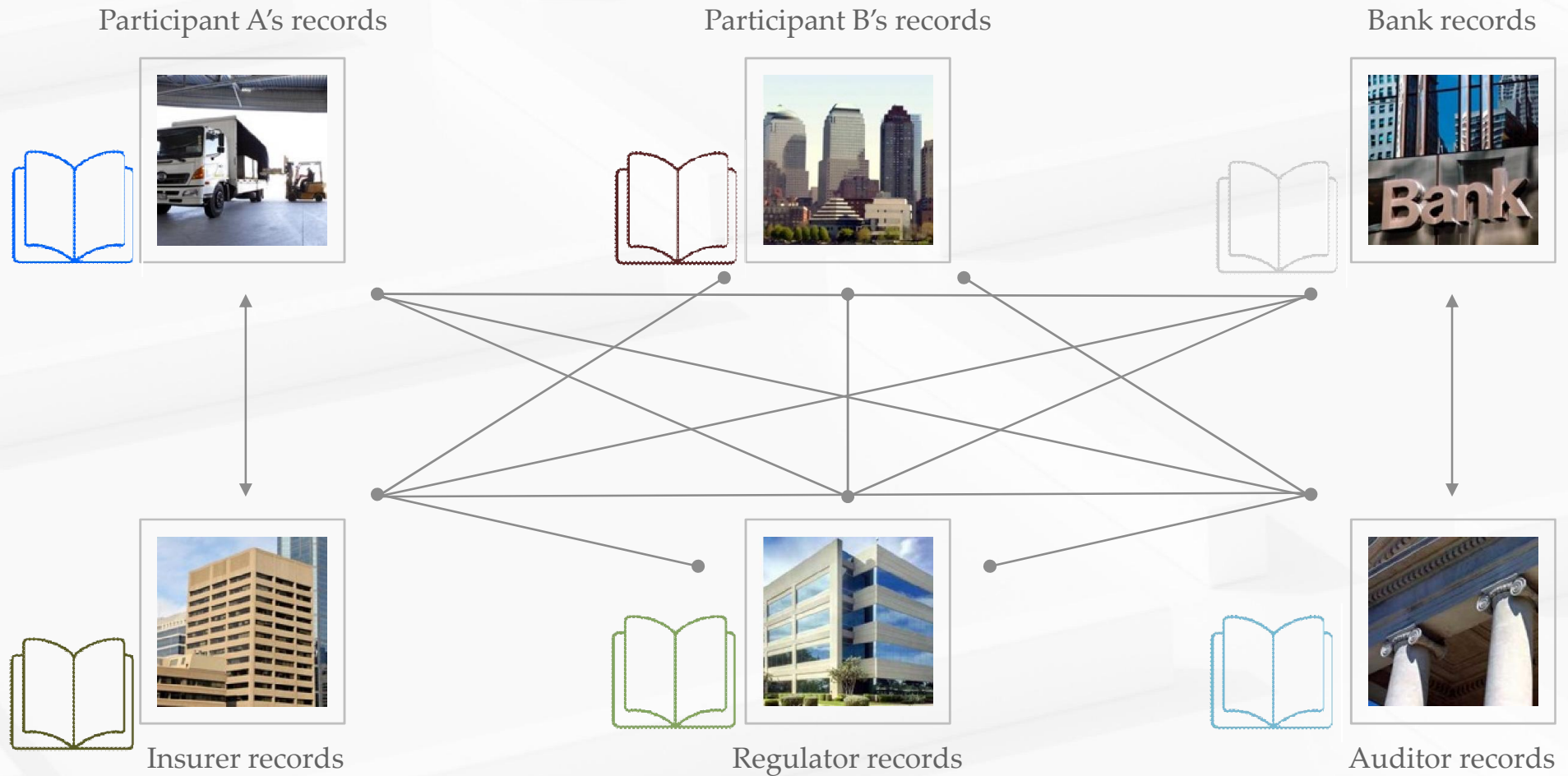
Contract: the conditions for a transaction to occur
If Anthony pays John money, then car passes from John to Anthony (simple)
If car won't start, funds do not pass to John (as decided by third party arbitrator) (more complex)



Blockchain

Problem

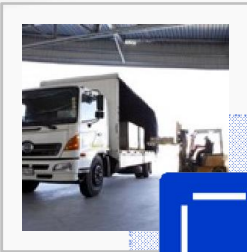
inefficient, expensive, vulnerable



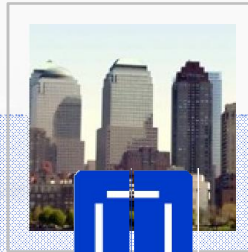
Solution

A shared, replicated, permissioned ledger...
...with consensus, provenance, immutability and finality

Participant A's records



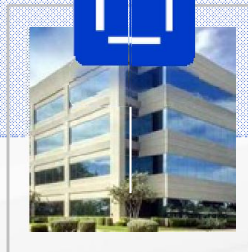
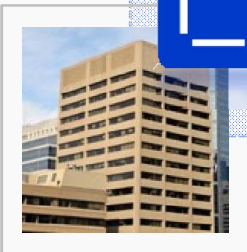
Participant B's records



Bank records



Blockchain



Insurer records

Regulator records

Auditor records

ifferent types of blockchain

Blockchain aim to provide **irrefutable proof** that transactions occurred between participants

ifferent types of blockchain exist:

Bitcoin is an example of an unpermissioned, public blockchain

- The first blockchain application
- Defines a shadow-currency and its ledger
- Resource intensive

Blockchain for business are generally permissioned and private, and prioritize

Identity over anonymity | Selective endorsement over proof of work | Assets over cryptocurrency

Blockchain



Producing the IBM Blockchain Platform

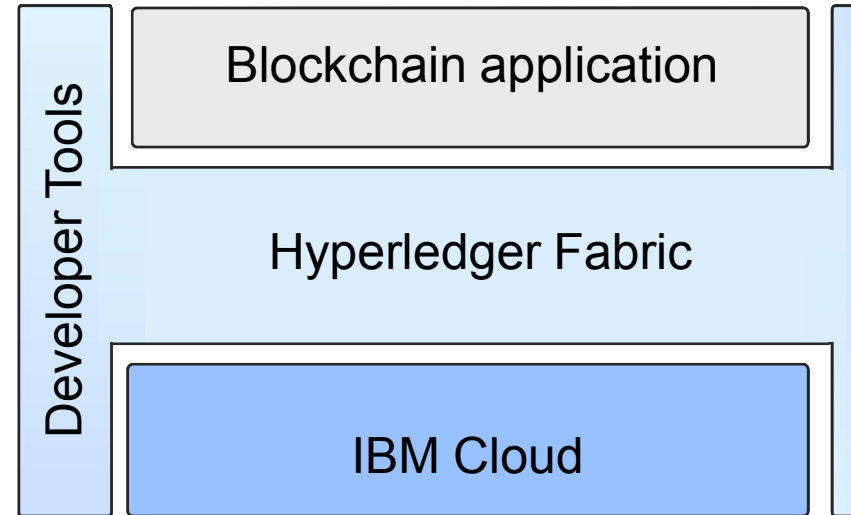
Blockchain Platform is a fully integrated enterprise-blockchain platform designed to accelerate the development, governance, and operation of a multi-transaction business network

Developer tools that will make use of Hyperledger Fabric SDK, to quickly build your blockchain application

Hyperledger Fabric also provides the ledger, which is managed through a set of intuitive operational tools

Governance tools for democratic management of the business network

Flexible deployment options, including a highly secure and performant IBM Cloud environment



Hyperledger: A Linux Foundation project

Blockchain Platform is underpinned by open source technology from the Hyperledger project

Hyperledger is a collaborative effort created to advance cross-industry blockchain technologies for business

Launched February 2016; now more than 100 member organizations

Open source
Industry standards
Shared governance model

Website: <https://www.hyperledger.org/members>
Updated: 4 October 2018

Blockchain

Premier



Associate

General

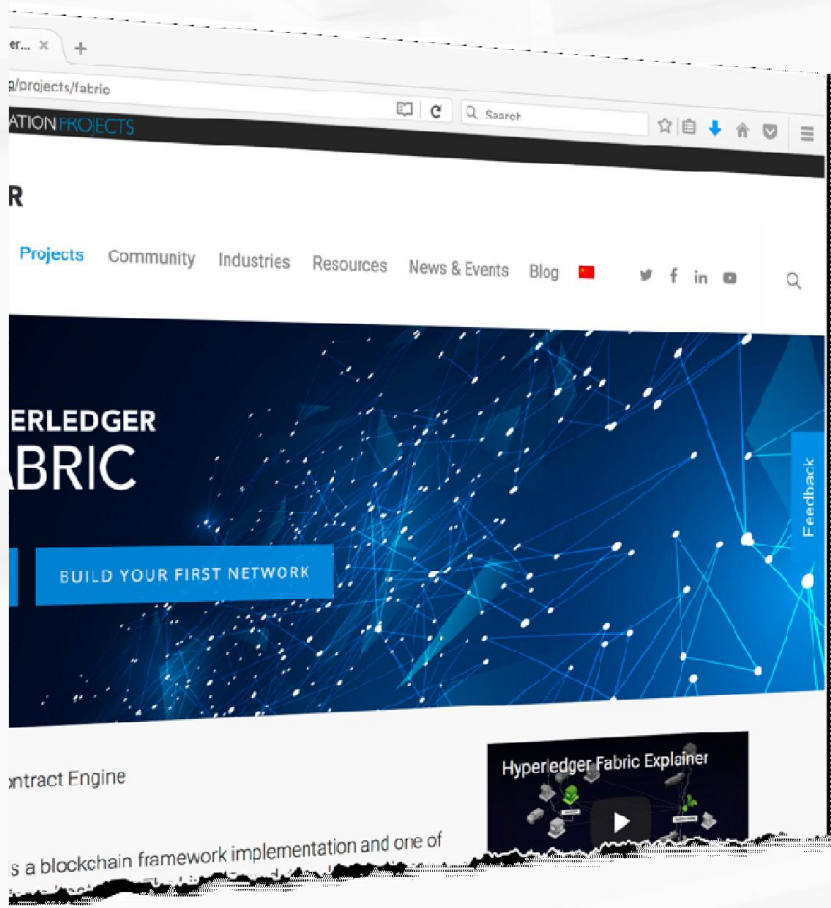


Academia Associate





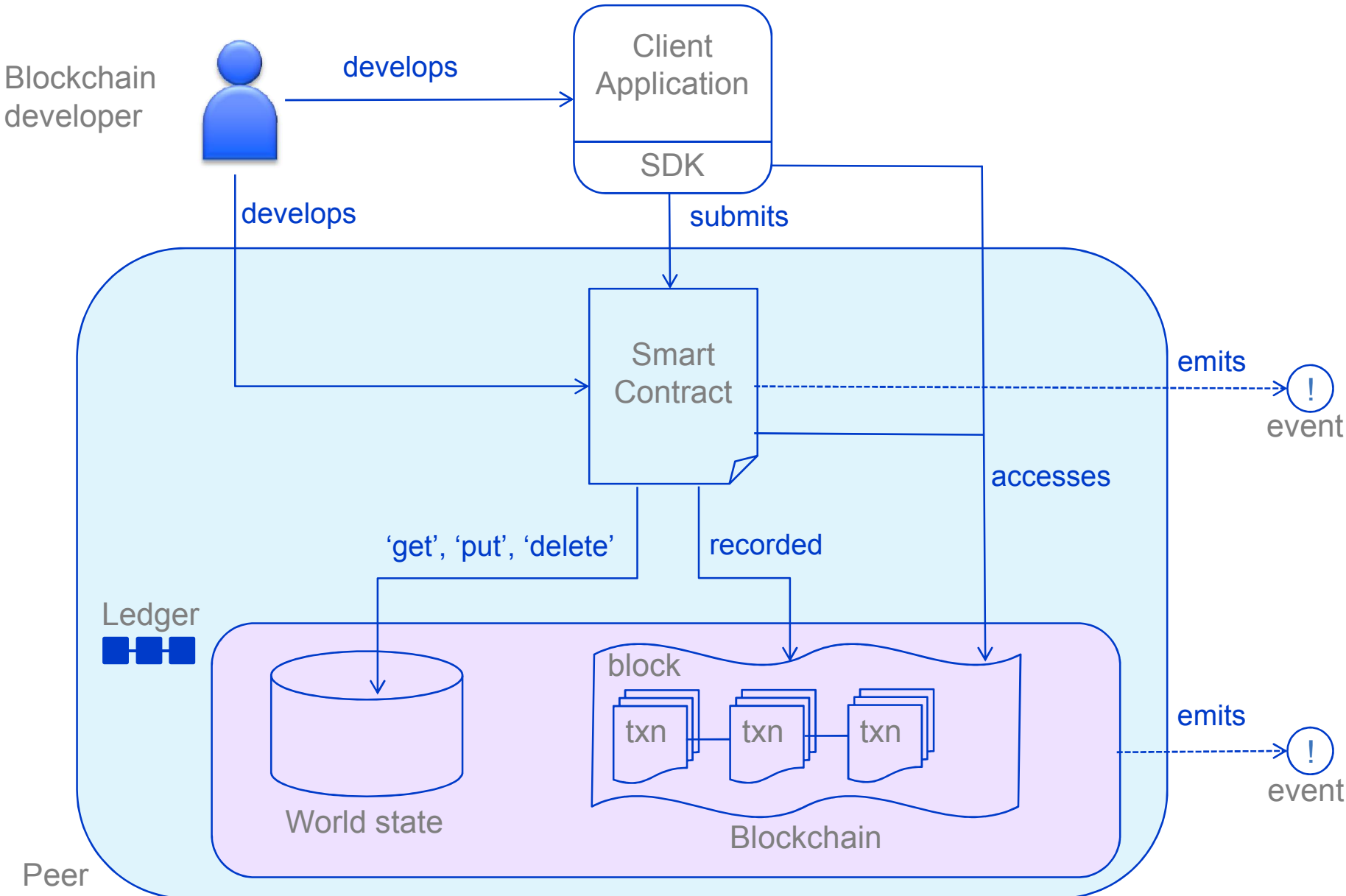
Distributed ledger



- An implementation of blockchain technology that provides a foundation for developing blockchain applications
- Emphasis on ledger, smart contracts, consensus, confidentiality, resiliency and scalability.
- V1.2 released July 2018
 - Includes significant confidentiality and security improvements
- IBM is one of the many contributing organizations



applications interact with the ledger



Blockchain Peer

demo of a blockchain application

In this demo, you will see:

A sample blockchain solution based around a vehicle manufacturing business network.

This solution includes a **smart contract** and a set of **applications** for the different users and businesses in the business network.

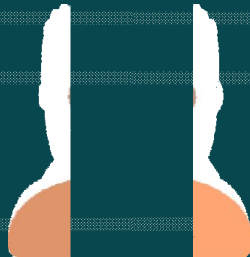
You can try it yourself today here:

<https://github.com/IBM-Blockchain/vehicle-manufacture>

Blockchain



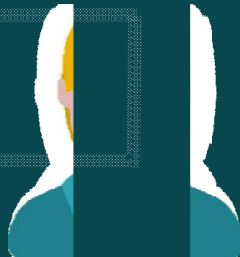
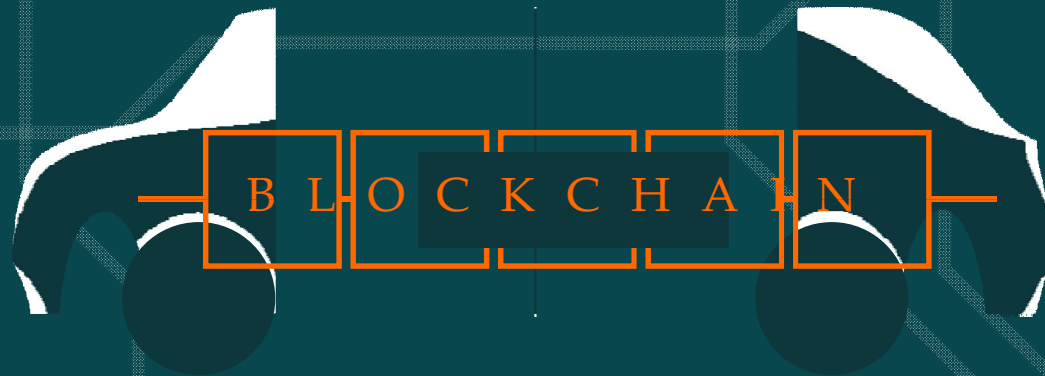
Alex
Agency for Vehicle
Standards



Paul
Buyer/Owner



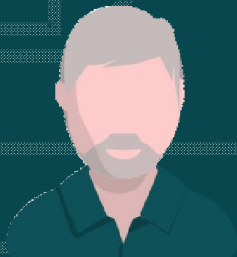
Debbie
VDA
Regulation
Administration



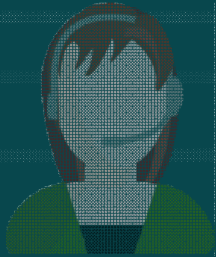
Mike
Arium Logistics
Employee



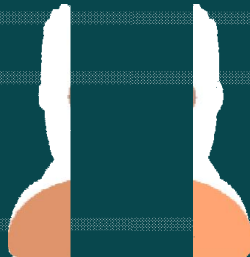
Vada
Police



Tommen
Insurer



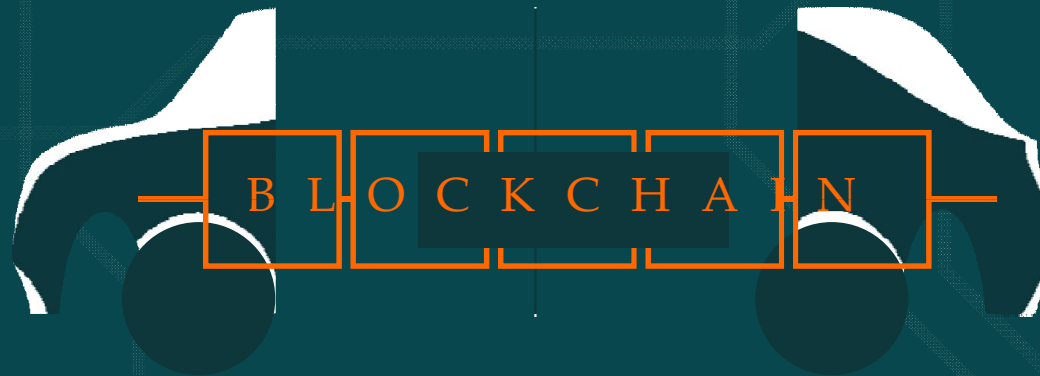
Alex
Agency for Vehicle
Standards



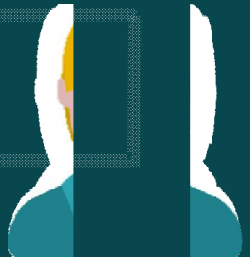
Paul
Buyer/Owner



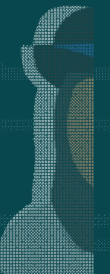
Debbie
VDA
Regulation
Administr



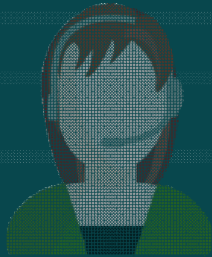
Tommen
Insurer



Mike
Arium Logistics
Employee

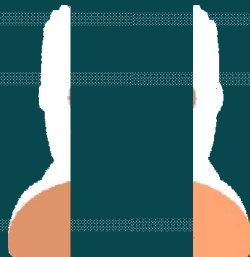


Vada
Police



Alex
Agency for Vehicle
Standards

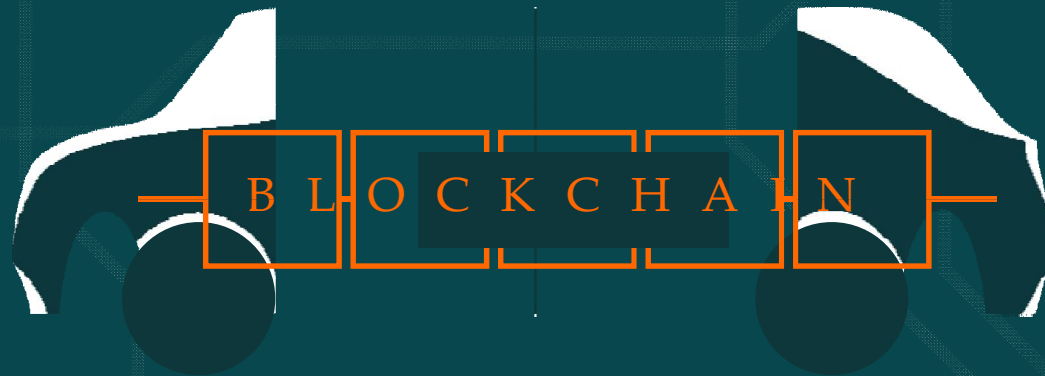
Mobile
App



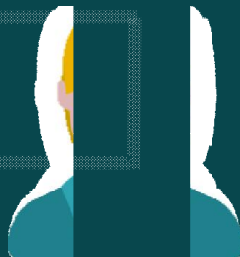
Paul
Buyer/Owner



Debbie
VDA
Regulation
Administr



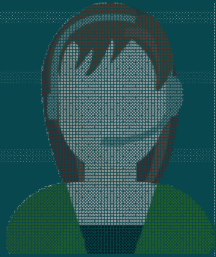
Tommen
Insurer



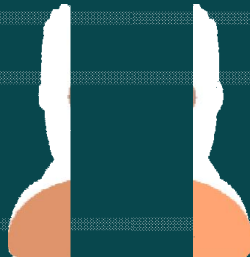
Mike
Arium Logistics
Employee



Vada
Police



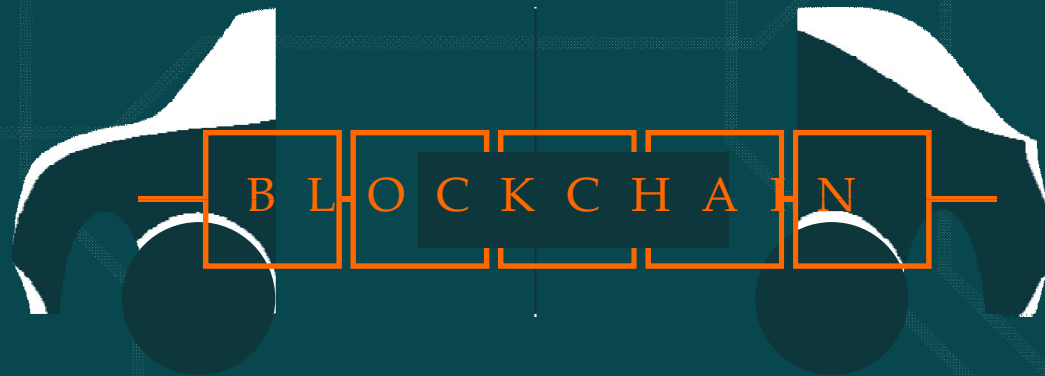
Alex
Agency for Vehicle
Standards



Paul
Buyer/Owner



Debbie
VDA
Regulation
Administr

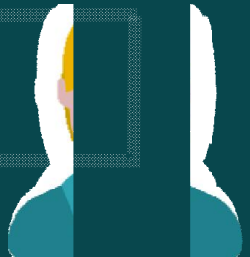


Mobile
App

Enterprise
Integration
Tools

ERP

IoT



Mike
Arium Logistics
Employee



Vada
Police

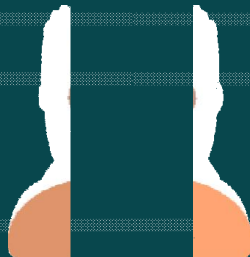


Tommen
Insurer



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Agency for Vehicle
Standards

Mobile
App



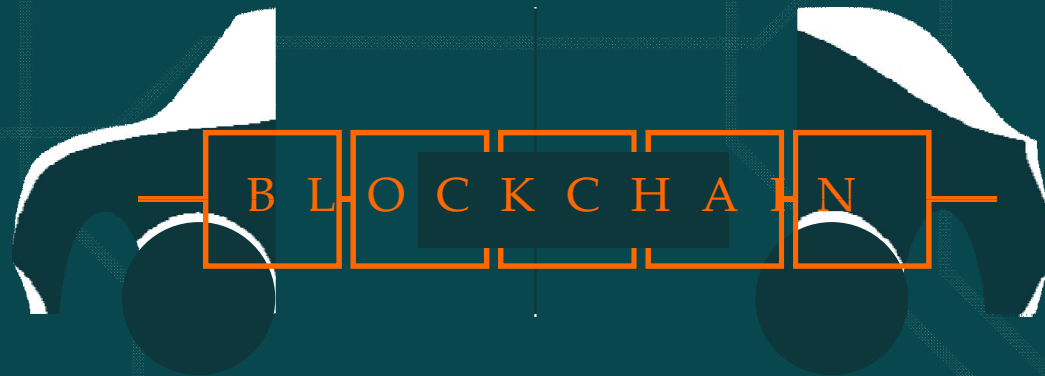
Paul
Buyer/Owner

Analytics

Business
Rules



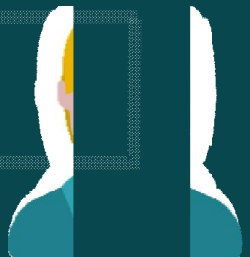
Debbie
VDA
Regulation
Administr



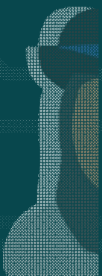
Enterprise
Integration
Tools

ERP

IoT



Mike
Arium Logistics
Employee



Vada
Police



Tommen
Insurer

Choice is key

At IBM, we believe that **choice is key** when it comes to the experience for blockchain developers.

We provide the freedom to utilize your existing skills and your programming language of choice:

- Develop smart contracts and applications in Go, Java, and JavaScript

We also provide the freedom to use your favorite editors, IDEs, and tools to get the job done:

- Develop smart contracts and applications in Visual Studio Code, Eclipse, Vim, etc

Blockchain

code walkthrough for Java developers

In this code walkthrough, you will see:

Smart contract developed in Java, using Visual Studio Code and the IBM Blockchain Platform developer tools extension.

Application developed in Java, using Eclipse.

Everything you will see is available today, open source software, and ready for you to try yourselves.

Blockchain

Thank you

Stone

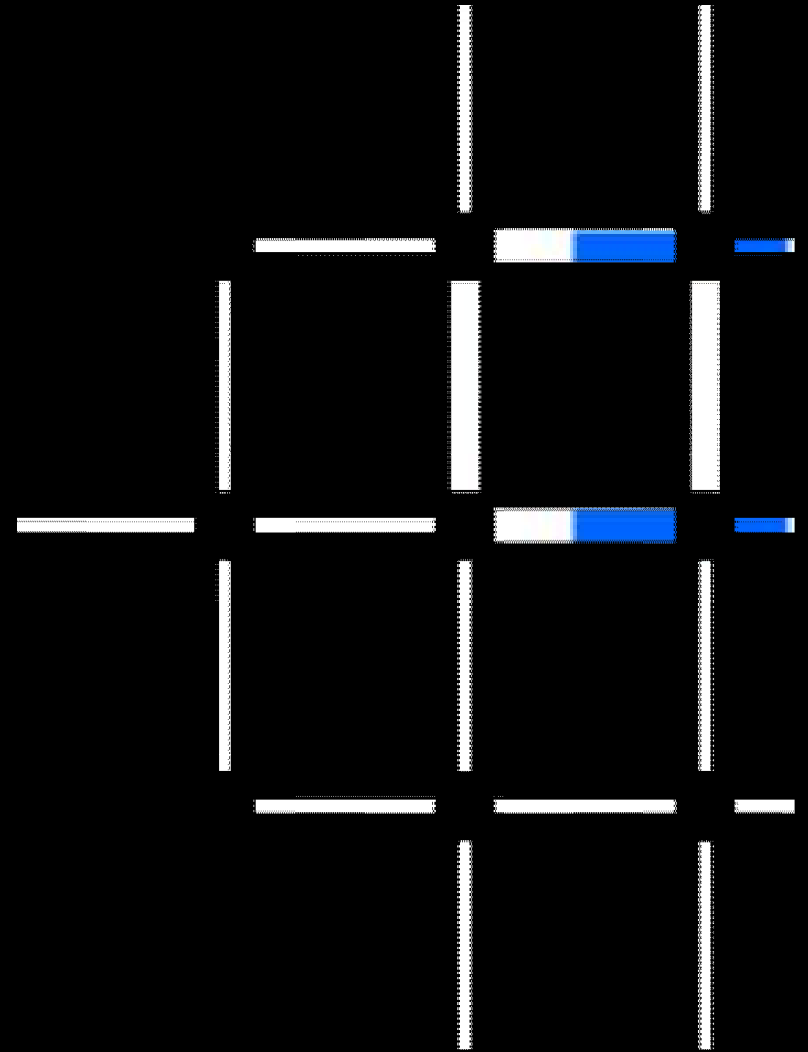
? Tweet us or go
n/blockchain

Blockchain

Blockchain

Blockchain

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