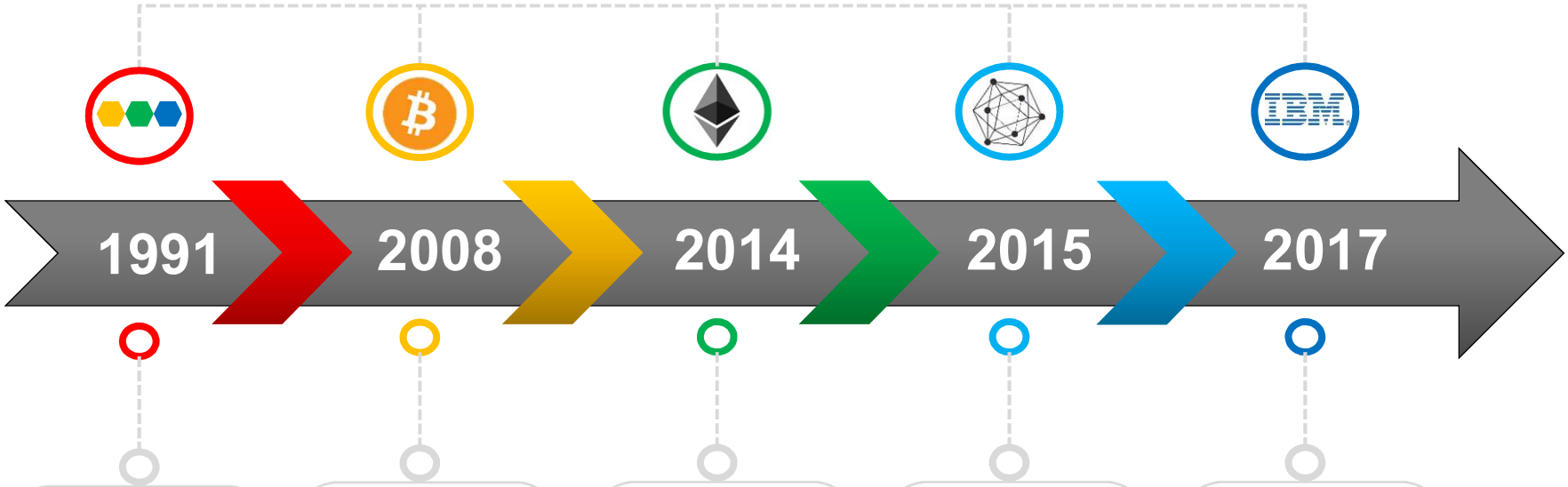
Introducing Blockchain for Business

Andre Jenie
Banking Architect / Country Blockchain Leader
jjenie@id.ibm.com

History of Blockchain



Chain of Blocks

Stuart Harber and Scott Scornetta worked on cryptographically secured **chain of blocks**. One year later with Bayer, they incorporated Merkle Trees

Blockchain v1.0

The first blockchain was conceptualized by a person (or group of people) known as Satoshi Nakamoto. It was implemented as a core component of the cryptocurrency **Bitcoin**.

Blockchain v2.0

The term blockchain 2.0 refers to new applications of the distributed blockchain database. It comes with a programming language that allows users to write more sophisticated **Smart Contracts**.

Hyperledger Fabric

Hyperledger Fabric (founded by IBM) is a **Blockchain for Business** framework hosted by the Linux Foundation intended as a foundation for developing blockchain applications or solutions with a modular architecture. The platform establishes **trust**, **transparency**, and **auditability**.

Blockchain Platform

IBM is introducing the **first fully integrated, enterprise-grade production blockchain platform**, as well as consulting services, that will allow more organizations to quickly activate their own business networks and access the vital capabilities needed to successfully develop, operate, govern and secure these networks.

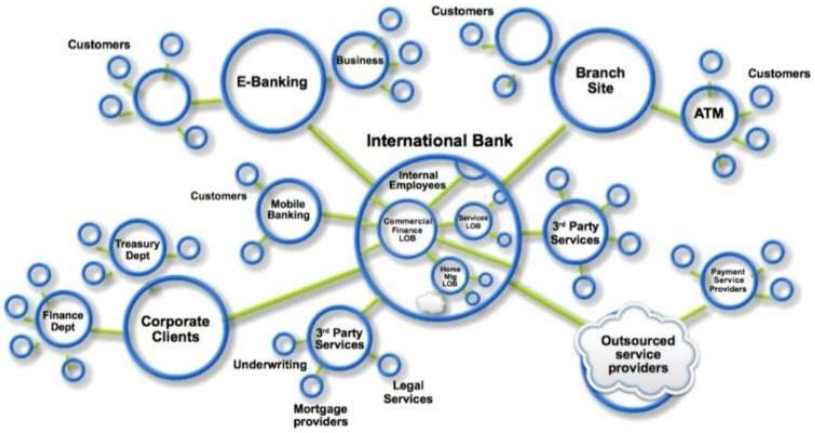
Source: Wikipedia, IBM

Public vs Private Blockchain

PERMISSIONLESS		PERMISSIONED
Public		Private
Anonymous		Identified
Autonomous		Regulated
Cryptocurrency		Asset
Proof of Work		PBFT

Business Network, Market, and Wealth

Business Networks



Business participants come together in a network

Assets

Tangible
e.g. house, car

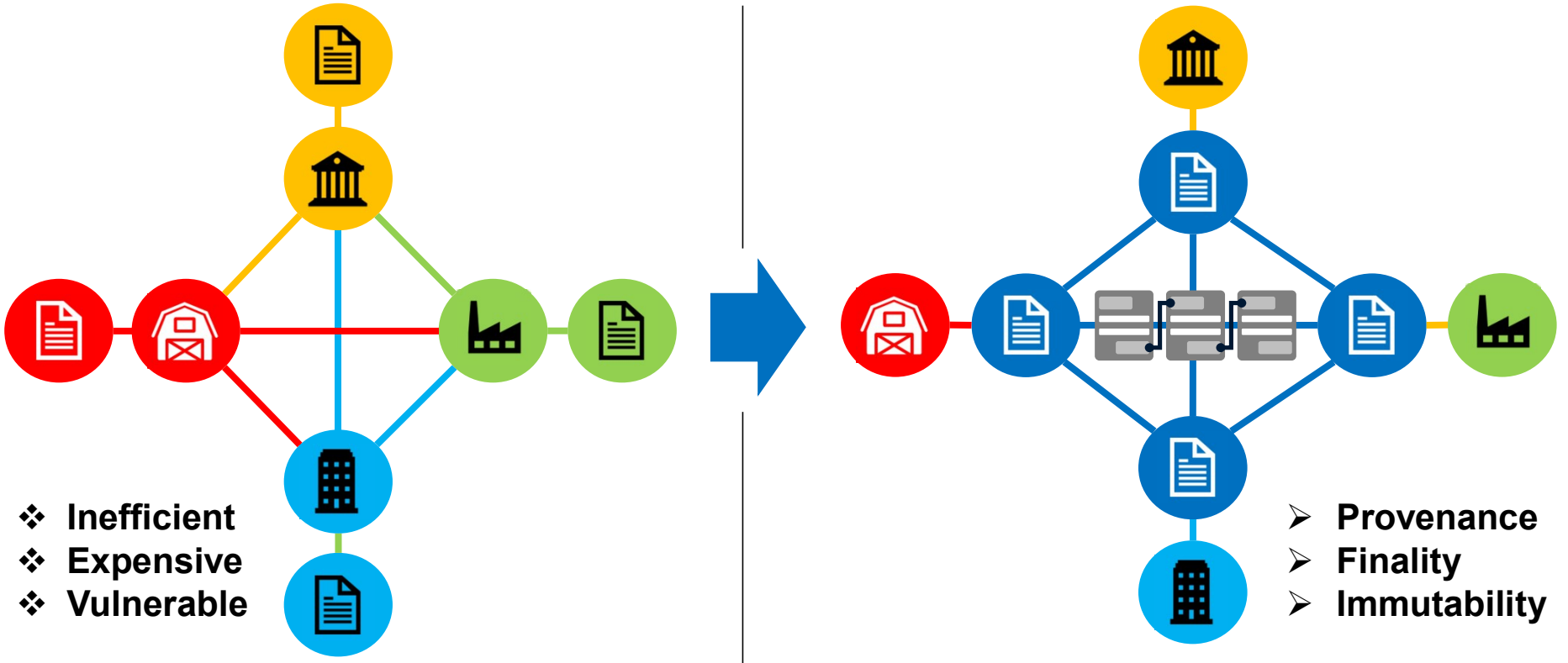
Intangible
e.g. digital music, photos

Assets are transferred across the network

Ledger

The system of record for a business.

Introducing **Blockchain for Business**



- Inefficient
- Expensive
- Vulnerable

TODAY

- Provenance
- Finality
- Immutability

TOMORROW

Shared Ledger | Smart Contracts | Consensus | Security

Example: Shared reference data

What

- Competitors/collaborators in a business network need to share reference data, e.g. bank routing codes
- Each member maintains their own codes, and forwards changes to a central authority for collection and distribution
- An information subset can be owned by organizations

How

- Each participant maintains their own codes within a Blockchain network
- Blockchain creates single view of entire dataset

Benefits

1. Consolidated, consistent dataset reduces errors
2. Near real-time access to reference data
3. Naturally supports code editing and routing code transfers between participants

Example: Supply chain

What

- Provenance of each component part in complex system hard to track
- Manufacturer, production date, batch and even the manufacturing machine program

How

- Blockchain holds complete provenance details of each component part
- Accessible by each manufacturer in the production process, the aircraft owners, maintainers and government regulators

Benefits

1. Trust increased, no authority "owns" provenance
2. Improvement in system utilization
3. Recalls "specific" rather than cross fleet

Example:
Audit and compliance

What

- Financial data in a large organization dispersed throughout many divisions and geographies
- Audit and Compliance needs indelible record of all key transactions over reporting period

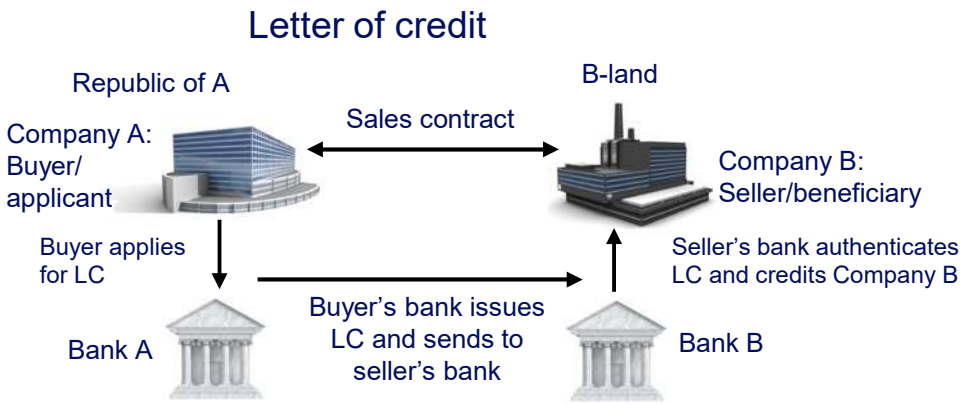
How

- Blockchain collects transaction records from diverse set of financial systems
- Append-only and tamperproof qualities create high confidence financial audit trail
- Privacy features to ensure authorized user access

Benefits

1. Lowers cost of audit and regulatory compliance
2. Provides “seek and find” access to auditors and regulators
3. Changes nature of compliance from passive to active

Example: Letter of credit



What

- Bank handling letters of credit (LOC) wants to offer them to a wider range of clients including startups
- Currently constrained by costs & the time to execute

How

- Blockchain provides common ledger for letters of credit
- Allows all counter-parties to have the same validated record of transaction and fulfillment

Benefits

1. Increase speed of execution (less than 1 day)
2. Vastly reduced cost
3. Reduced risk, e.g. currency fluctuations
4. Value added services, e.g. incremental payment

Further examples by (selected) industry

Financial

- Trade Finance
- Cross currency payments
- Mortgages

Public Sector

- Asset Registration
- Citizen Identity
- Medical records
- Medicine supply chain

Retail

- Supply chain
- Loyalty programs
- Information sharing (supplier – retailer)

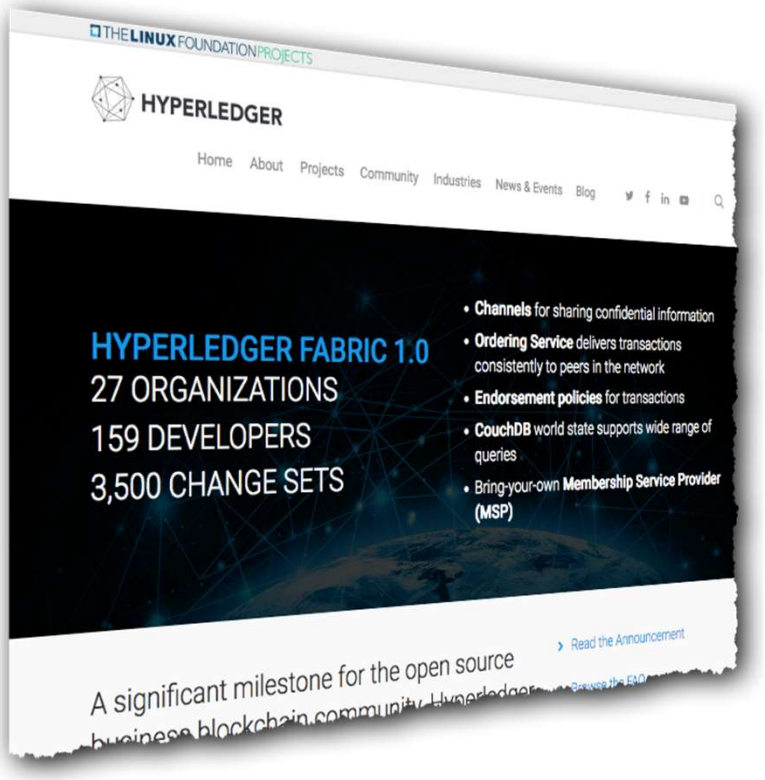
Insurance

- Claims processing
- Risk provenance
- Asset usage history
- Claims file

Manufacturing

- Supply chain
- Product parts
- Maintenance tracking

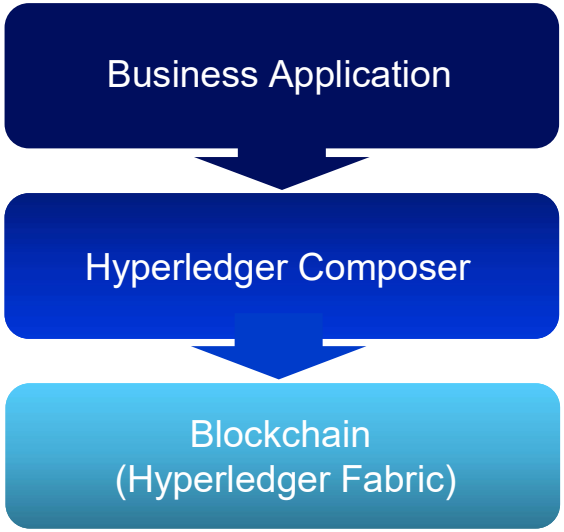
Hyperledger Fabric: Distributed ledger platform



- An implementation of blockchain technology that is a foundation for developing blockchain applications
- Emphasis on ledger, smart contracts, consensus, confidentiality, resiliency and scalability.
- V1.0 released July 2017
  - 159 developers from 27 organizations
  - IBM is one contributor of code, IP and development effort to Hyperledger Fabric
- V1.1 released March 2018

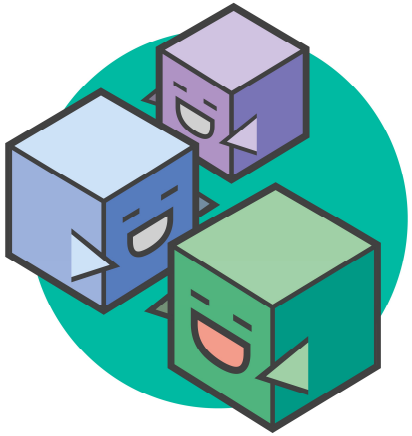
http://hyperledger-fabric.readthedocs.io/

Hyperledger Composer: Accelerating Time to Value



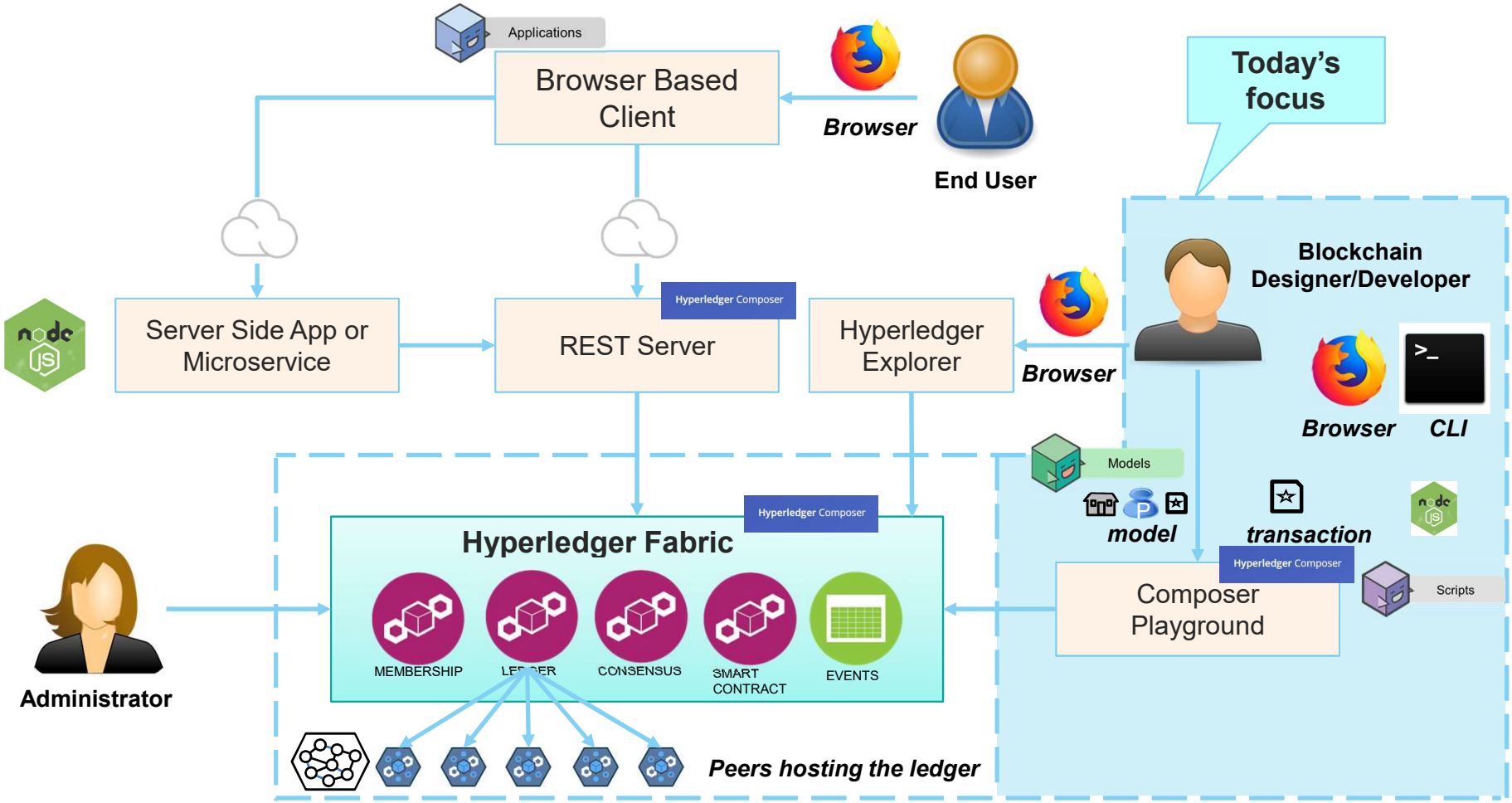
https://hyperledger.github.io/composer

- A suite of high level application abstractions for business networks
- Emphasis on **business-centric vocabulary** for quick solution creation
- Reduce risk, and increase understanding and flexibility



- Features
  - Model your business networks, test and expose via APIs
  - Applications invoke transactions to interact with business network
  - Integrate existing systems of record
- Fully open and part of Linux Foundation Hyperledger
- Try it in your web browser now:
  http://composer-playground.mybluemix.net/

Application Architecture



IBM Blockchain Strategy

Drive the development of **applications** for specific business use-cases, to be deployed to active **blockchain networks**

Services

Collaborate with services teams from ideation all the way to production

Ecosystem

Tap into our diverse ecosystem to develop strategic partnerships and create your competitive advantage

Solutions

Solve critical industry challenges by building and joining new business networks and applications

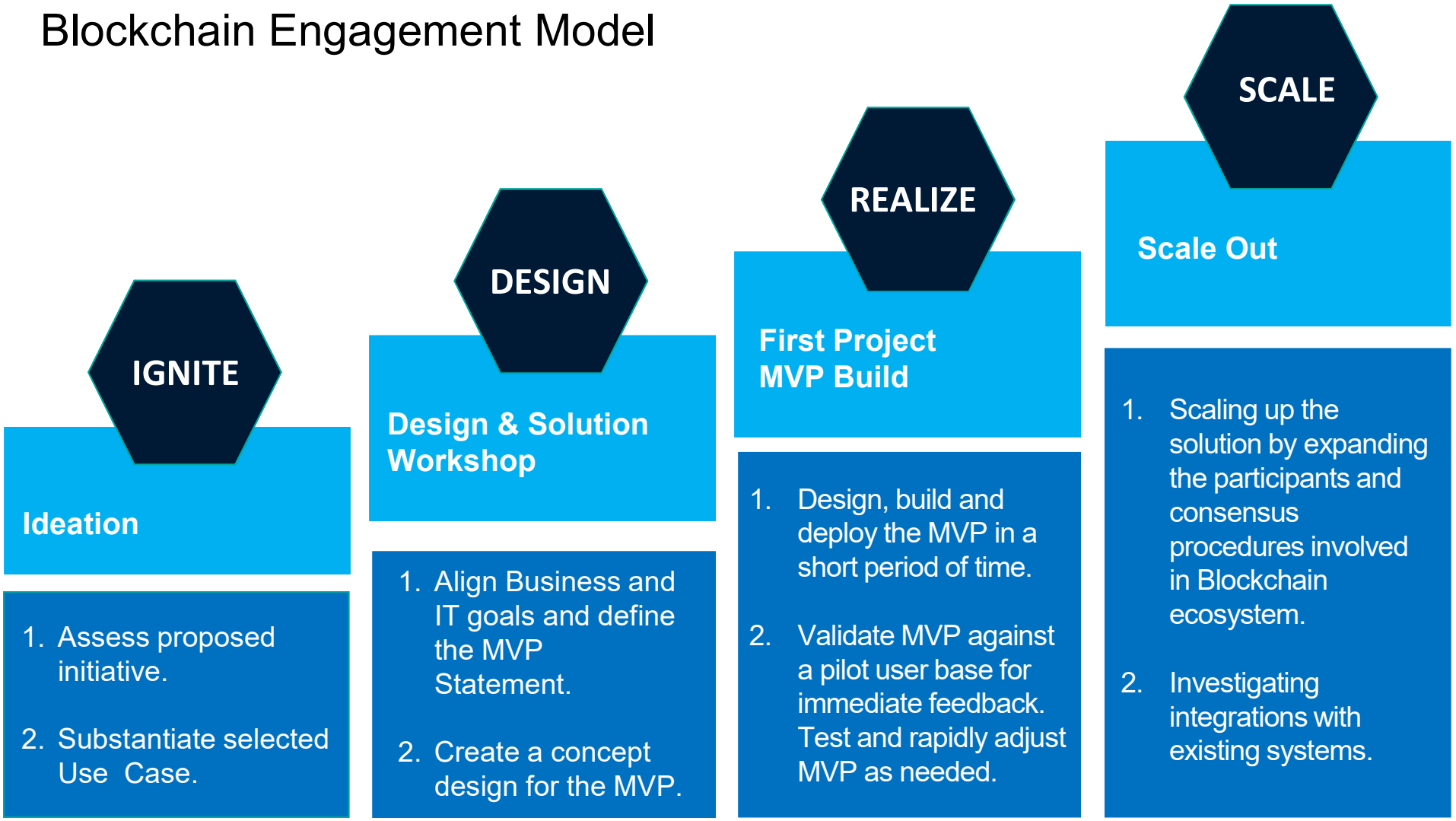
Platform

Develop, govern and operate enterprise blockchain networks with speed and security

HYPERLEDGER

A founding, premier member of Hyperledger, IBM is committed to open source, standards & governance

Blockchain Engagement Model



Thank You!