Blockchain and Smart (Legal) Contracts

Summer School: Transnational Commercial Law & Technology

Verona, May 30 – June 1, 2019
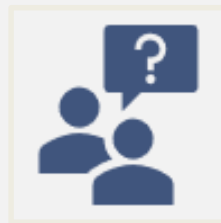
Nevena Jevremovic, IACCM

Part I: Contract and Commercial Management
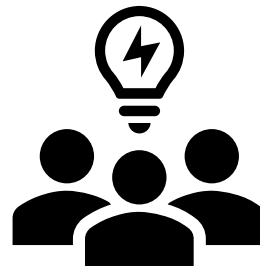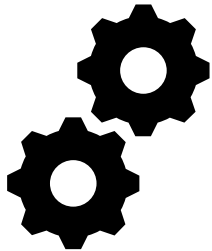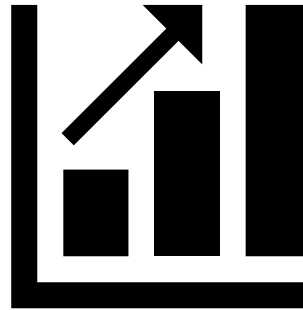
Part II: Blockchain and Smart (Legal) Contracts

Part III: Challenges

Contract and Commercial Management

Contract and Commercial Management

CCM: Strategic
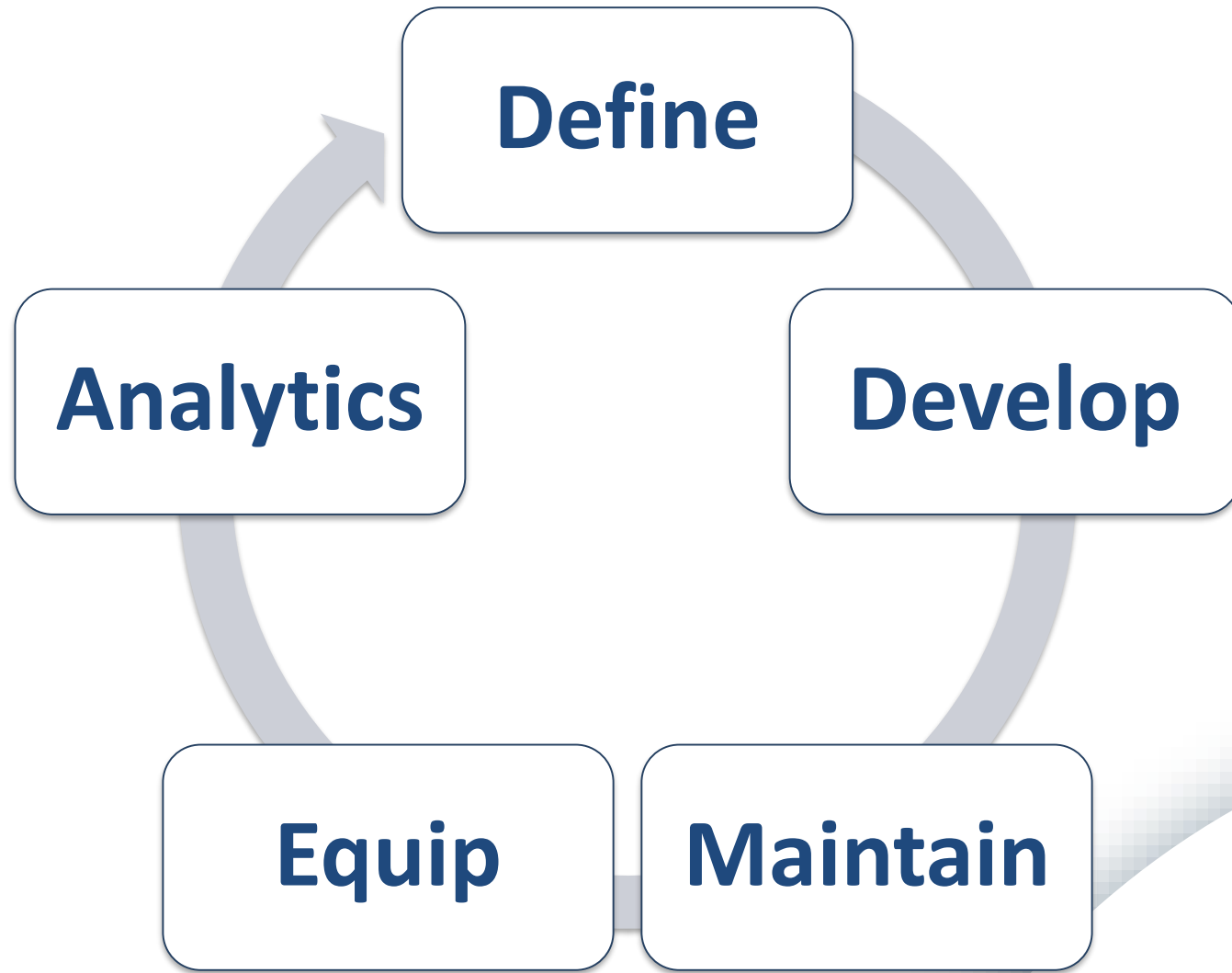
CCM: Transactional

Blockchain

How did it develop?

2019 – Robust network

2013 - Ethereum

2008 – Introduction of bitcoin

1990's – Initial research work
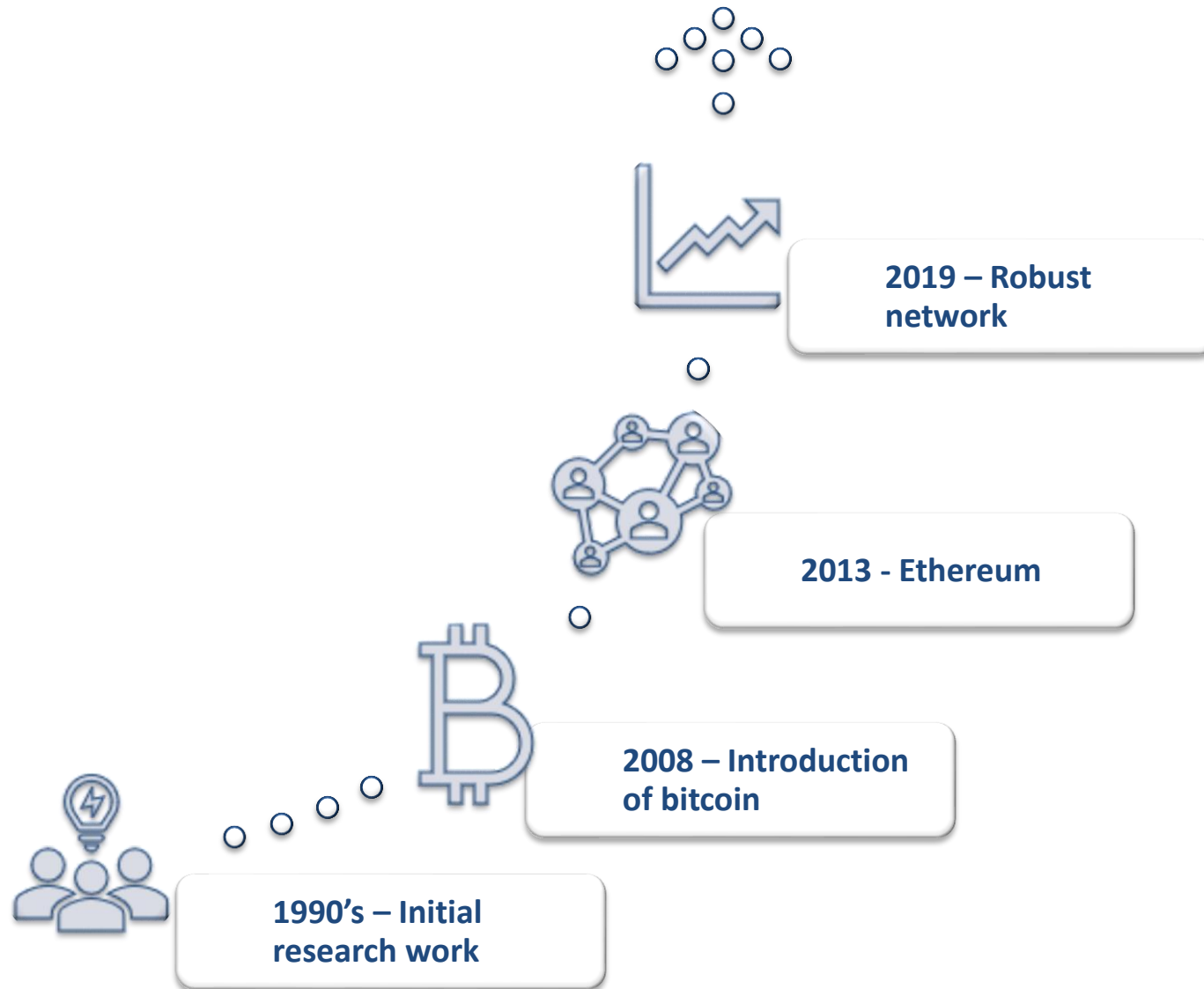
What is it?

Blockchain is a ***distributed***, ***decentralized***, ***public ledger***.

Digital information + **Public Database** = **Blockchain**

How it works?

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Transaction occurs

Transaction is verified

Transaction is stored in a block

Block is given a hash

Block is added to blockchain and visible for anyone
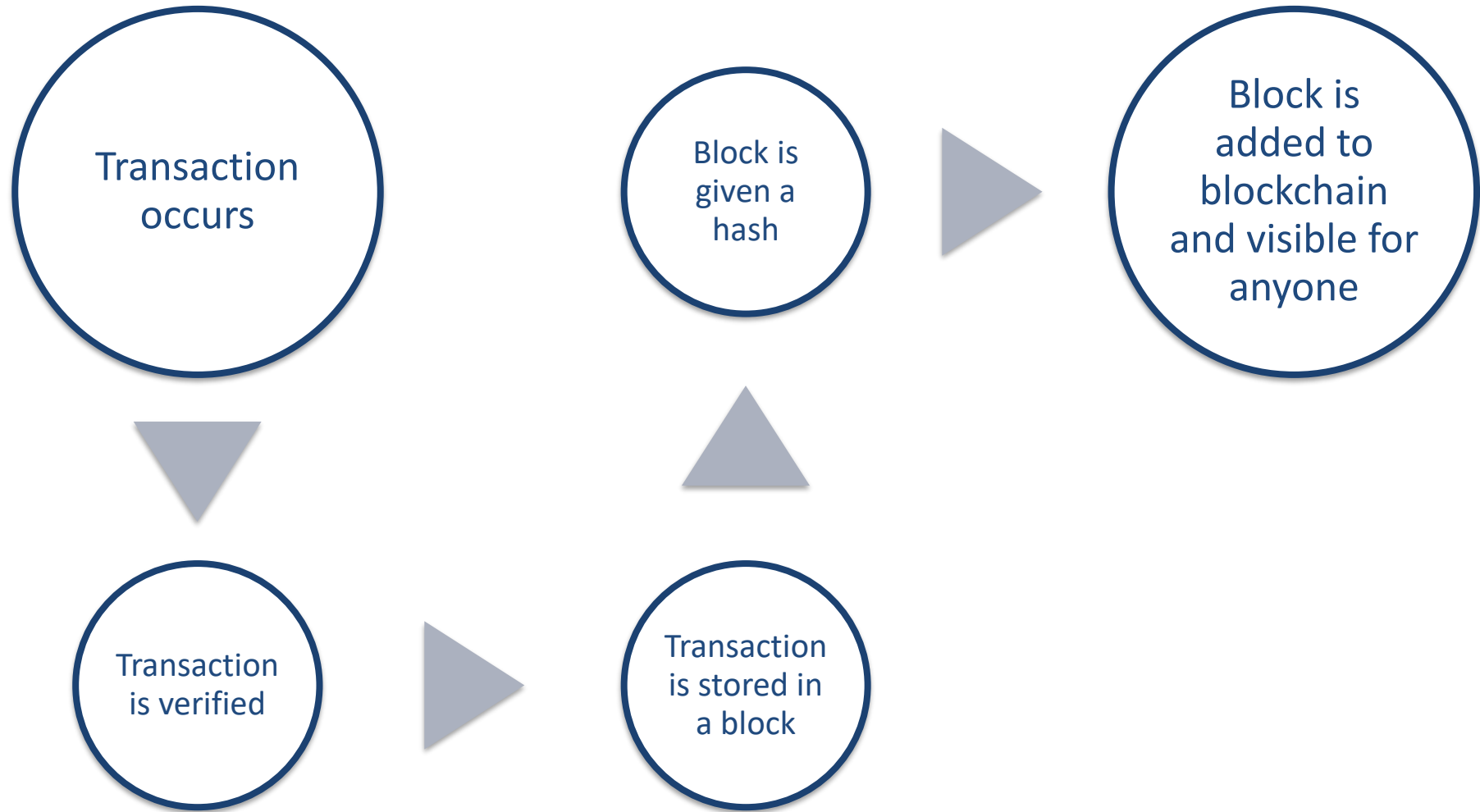
Three key elements

1. The ledger
2. The network
3. The consensus
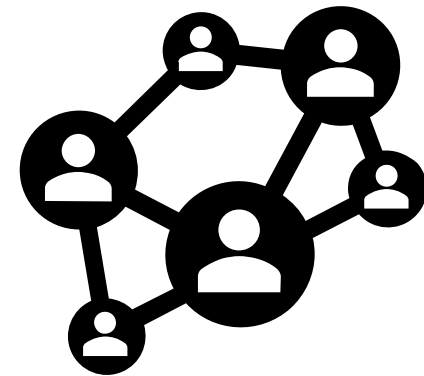
Are all blockchains the same?

Public blockchain

Private blockchain

Why is it important?

New method of record keeping

Embeds the notion of trust

Potential

Ensures high level of security

Enables P2P trade
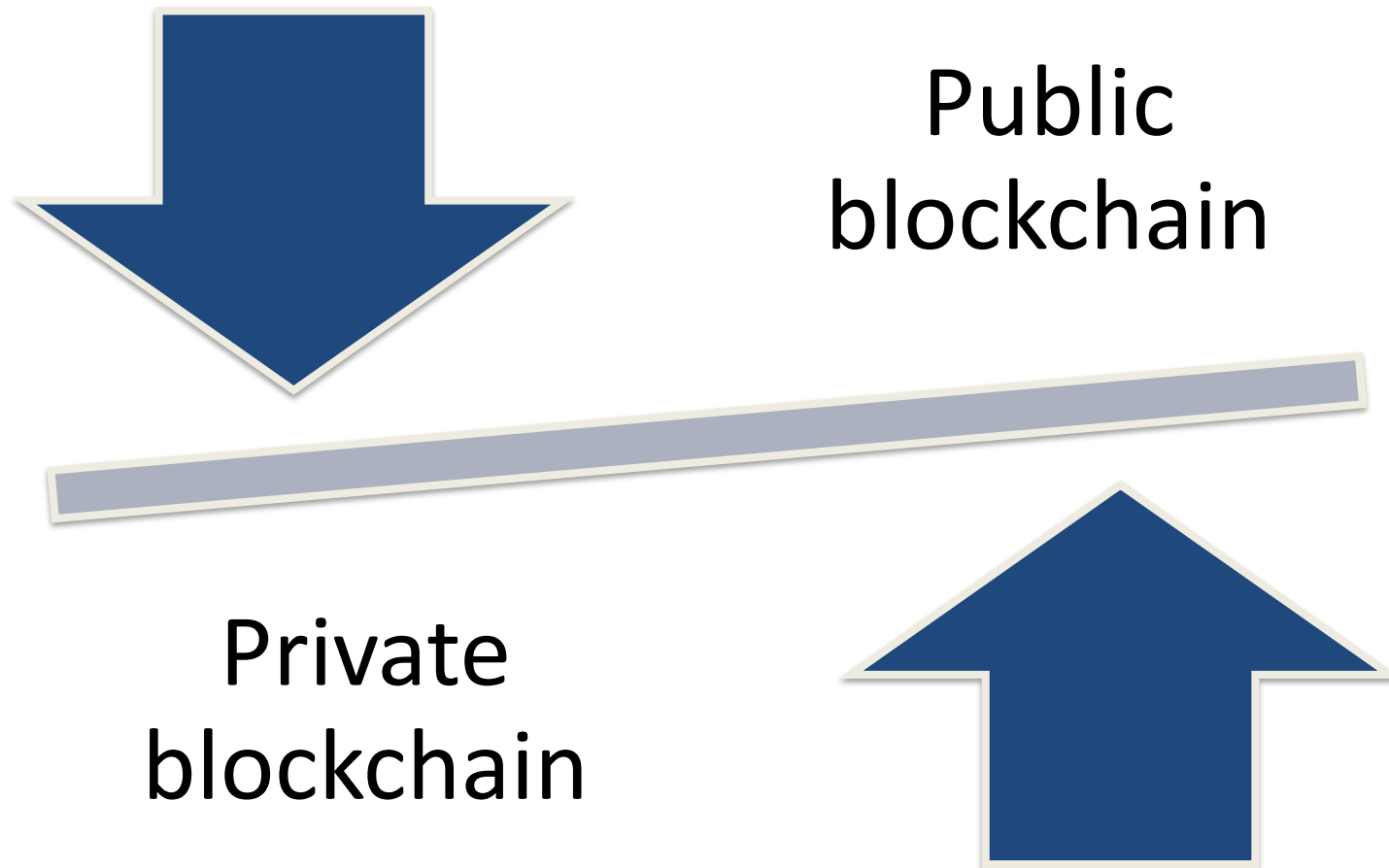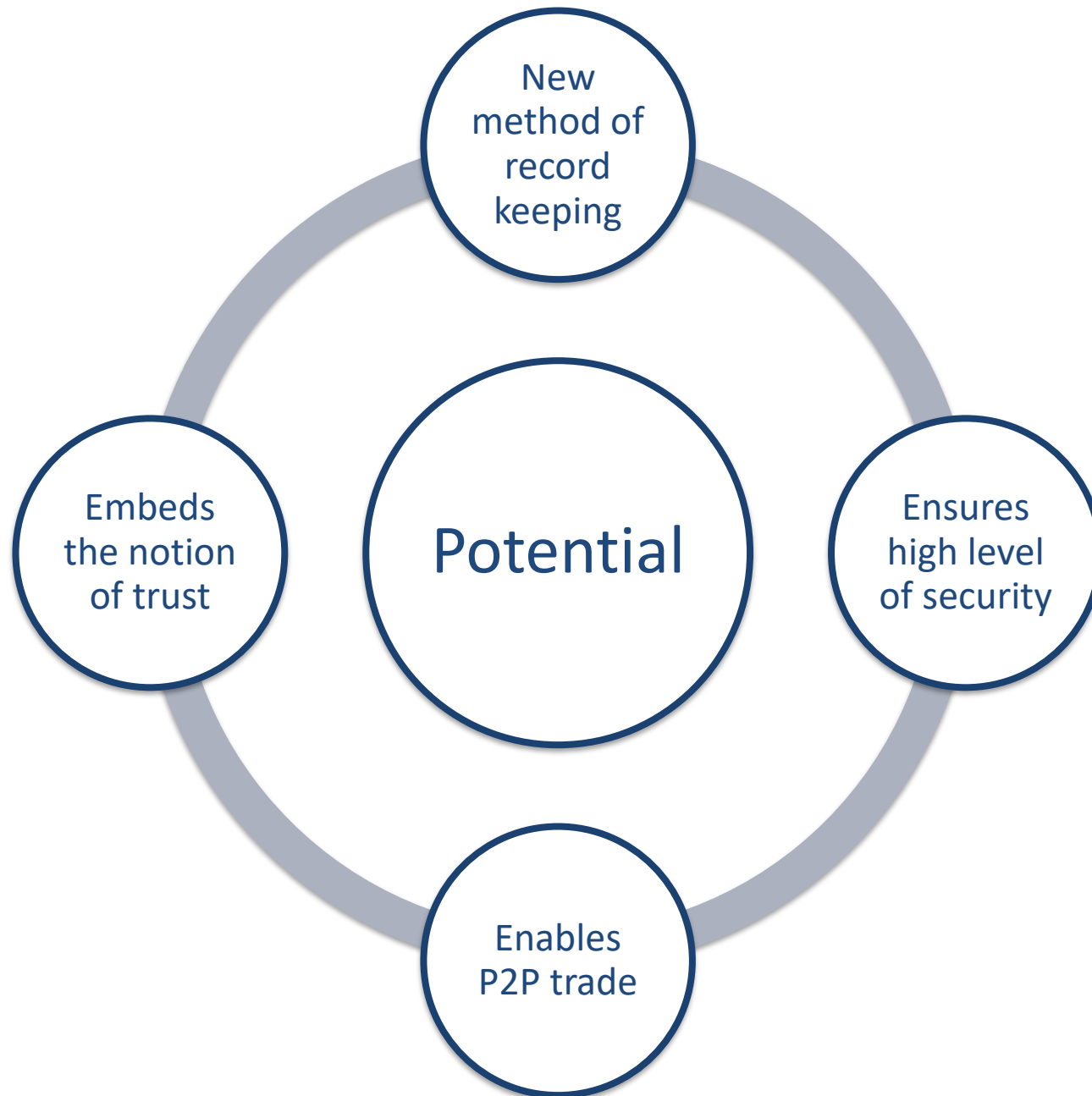
Smart (Legal) Contracts

Evolution of *digital agreements*

E-Commerce

Data Oriented Contracts

Computable Contracts

Evolution of smart contracts IACCM

2019 – Exploring the potential for its use

2008-2019 – Smart Contracts

2008 – Introduction of bitcoin

1990's –Nick Szabo
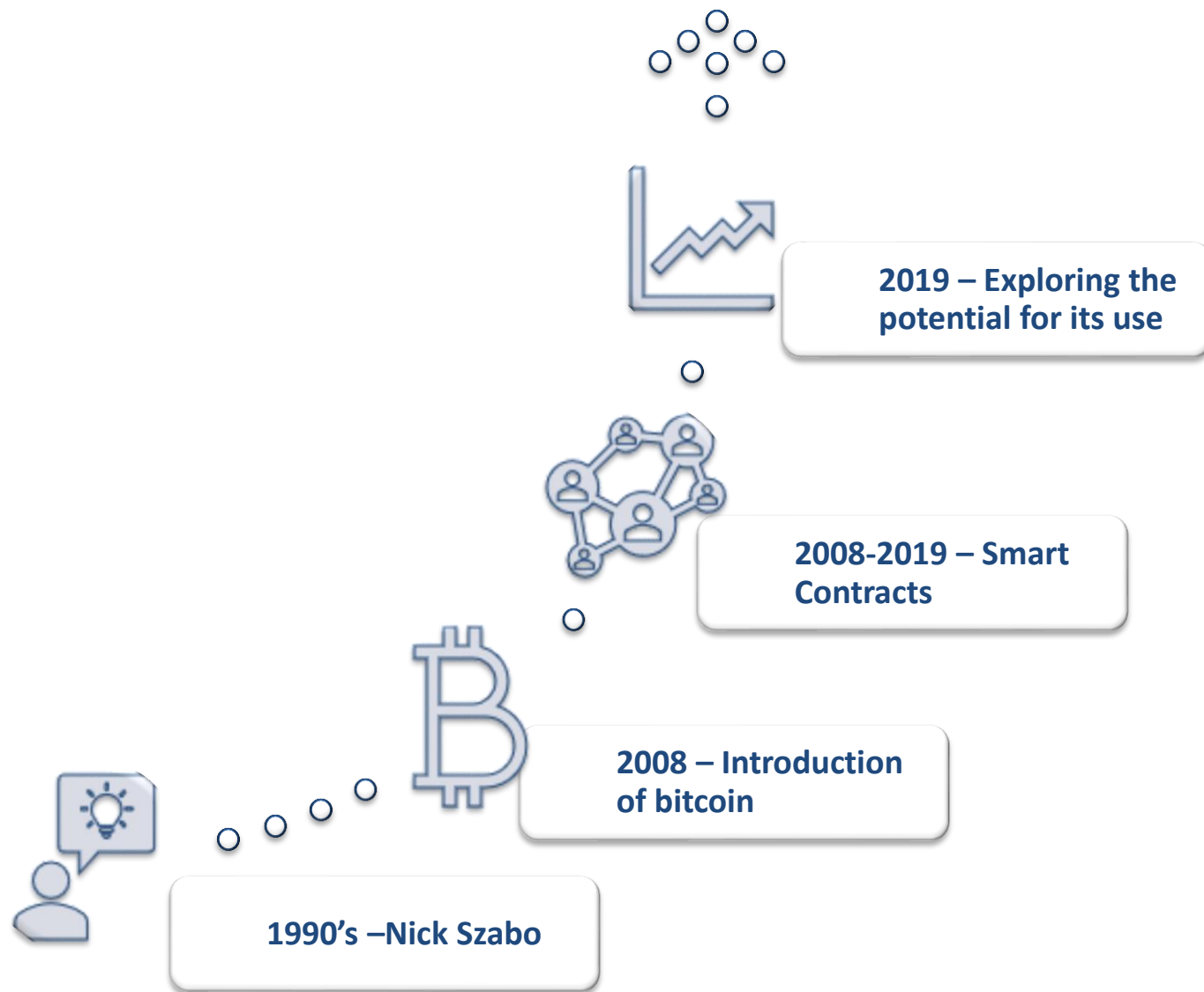
Smart contracts

*A smart contract is a **piece of software** (code) **run on a distributed ledger** enabling **automatic execution of an agreement** reached between two or more parties.*

Computable contracts

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*A "smart" legal contract is a **legally binding agreement** that is **digital** and able to **connect** its terms and **the performance of its obligations** to **external sources of data** and **software systems**.*
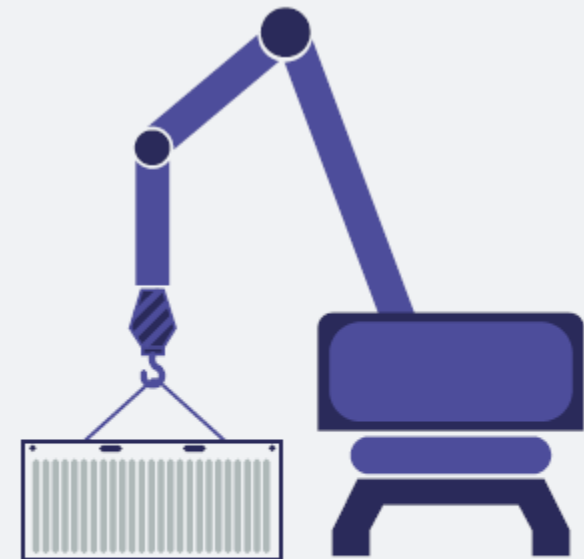
Use Cases

IBM and Maersk: Cross Border Supply Chain

The flower grower readies the product for international shipment. Shipment information is added to the blockchain.
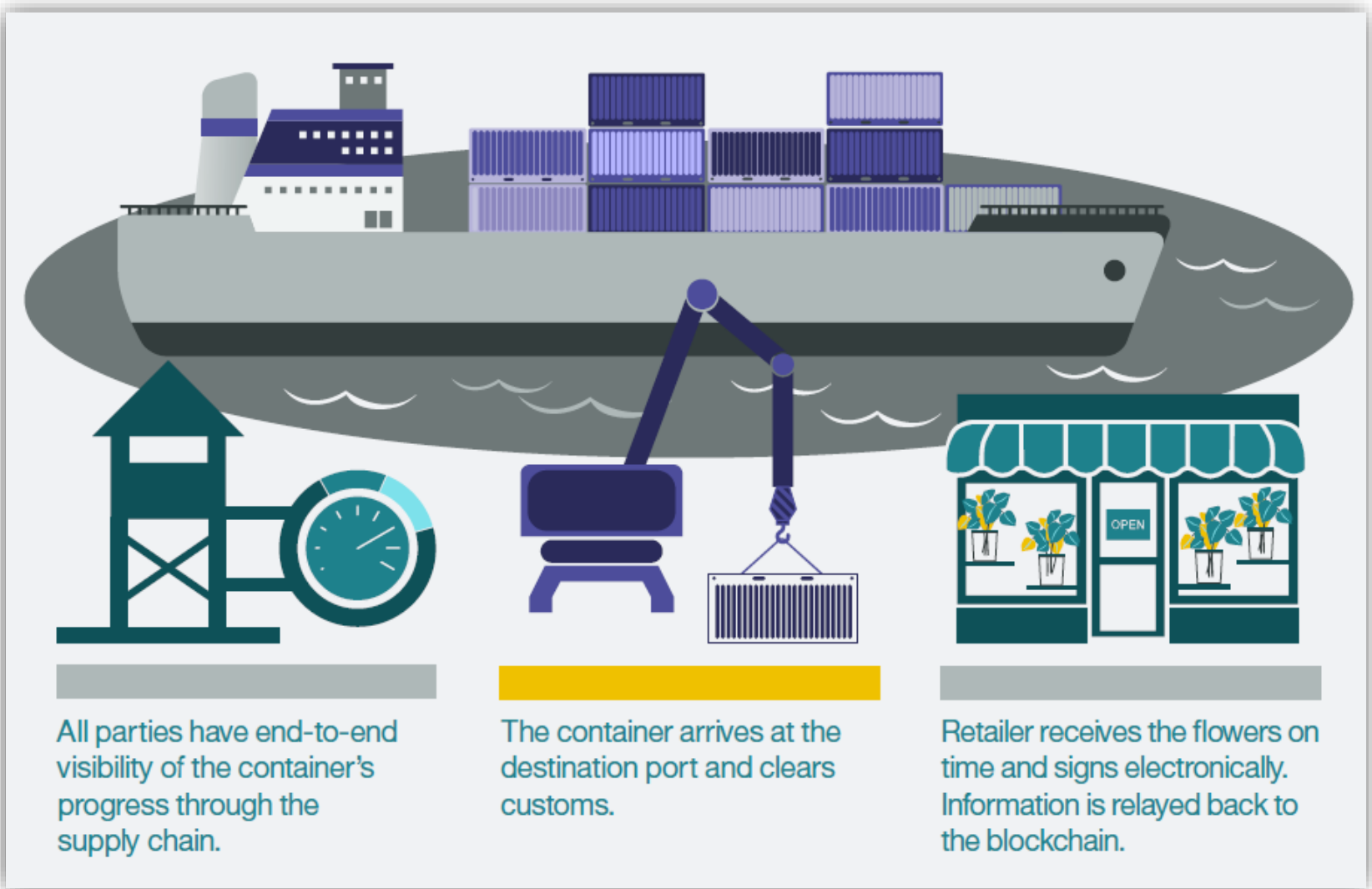
As the container awaits transfer to port, officials submit approvals electronically. Blockchain confirms the transaction and executes a smart contract, releasing the shipment.

The container is loaded onto the ship.

IBM and Maersk: Cross Border Supply Chain

All parties have end-to-end visibility of the container's progress through the supply chain.
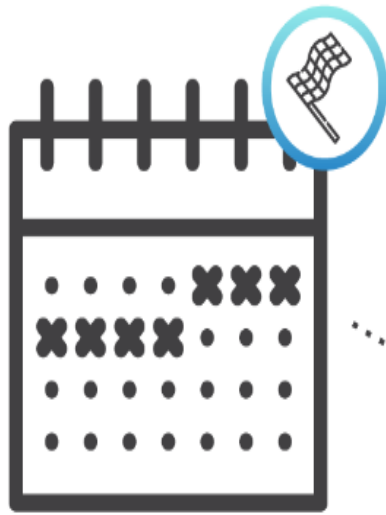
The container arrives at the destination port and clears customs.

Retailer receives the flowers on time and signs electronically. Information is relayed back to the blockchain.

Walmart Case Study: Food Safety Control

For mangoes in the US, the time needed to trace their provenance went from 7 days to... 2.2 seconds!

7 Day Tracking

2.2 Second Tracking

Accord Project Template

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Ergo | **Test Execution**

✈ Send Request | ↺ Reset Contract

Request
```
1 {
2   "$class": "org.accordproject.signature.ContractSigned",
3   "contract": "MY_CONTRACT"
4 }
```

Response
```
1 {
2   "$class": "org.accordproject.cicero.runtime.Response",
3   "transactionId": "f34f3c47-8b77-489a-8d8e-5d1491f4d2ae",
4   "timestamp": "2019-05-28T12:25:40.858Z"
5 }
```

Contract State
```
1 {
2   "$class": "org.accordproject.payment.fulluponsignature.FullPaymentUponSignatureState",
3   "status": "INITIALIZED",
4   "stateId": "1"
5 }
```

Obligations
```
1 []
```

Accord Project Template

IACCM

Send Request **Reset Contract**

Request
```
1 {
2   "$class": "org.accordproject.signature.ContractSigned",
3   "contract": "MY_CONTRACT"
4 }
```

Response
```
1 {
2   "$class": "org.accordproject.cicero.runtime.Response",
3   "transactionId": "4b85133b-fc40-4f46-9ae8-5911ecb65a53",
4   "timestamp": "2019-05-28T12:27:24.327Z"
5 }
```

Contract State
```
1 {
2   "$class": "org.accordproject.payment.fulluponsignature.FullPaymentUponSignatureState",
3   "status": "OBLIGATION_EMITTED",
4   "stateId": "1"
5 }
```

Obligations
```
1  [
2    {
3      "$class": "org.accordproject.cicero.runtime.PaymentObligation",
4      "amount": {
5        "$class": "org.accordproject.money.MonetaryAmount",
6        "doubleValue": 0.01,
7        "currencyCode": "USD"
8      },
9      "description": "Dan should pay contract amount to Steve",
10     "contract":
       "resource:org.accordproject.payment.fulluponsignature.FullPaymentUponSignatureContract#fa7932cb-3a70-
       4ece-93c4-22a43662119c",
11     "promisor": "resource:org.accordproject.cicero.contract.AccordParty#Dan",
12     "promisee": "resource:org.accordproject.cicero.contract.AccordParty#Steve",
13     "eventId": "valid",
14     "timestamp": "2019-05-28T12:27:24.328Z"
15   }
16 ]
```

Challenges

Focus thus far...

- Are smart contracts *contracts*?

- Do we need a legal framework to regulate blockchain and smart contracts?

- What would be the appropriate legal framework for regulating smart contracts and blockchain?

What it comes down to...

Contract simplification and design

Thank you!

Setting the Global Standard

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