



# Blockchain for Enterprise

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# Blockchain is not just about money

"...a sweeping vista of opportunity to **reimagine how the financial system can and should work** in the Internet era, and **a catalyst to reshape that system** in ways that are more powerful for individuals and businesses alike"

- Marc Andreessen, A16z

CIO JOURNAL.

## Why Blockchains Could Transform How the Economy Works

 Bloomberg  
Businessweek

The Technology would turn a company into a  
seamless network of coordinated freelancers

**Forbes**

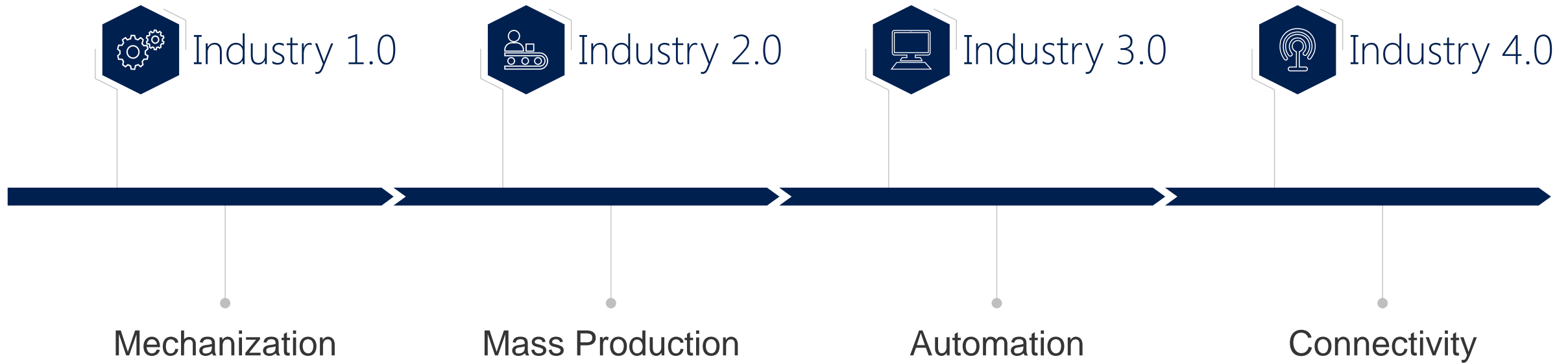
Blockchain For Supply Chain:  
Enormous Potential Down The Road

Is Blockchain the Most Important  
IT Innovation of Our Age?

By The Guardian



# Technology has always affected how we do business



# Business is built on trust

There is massive opportunity to improve shared business processes:

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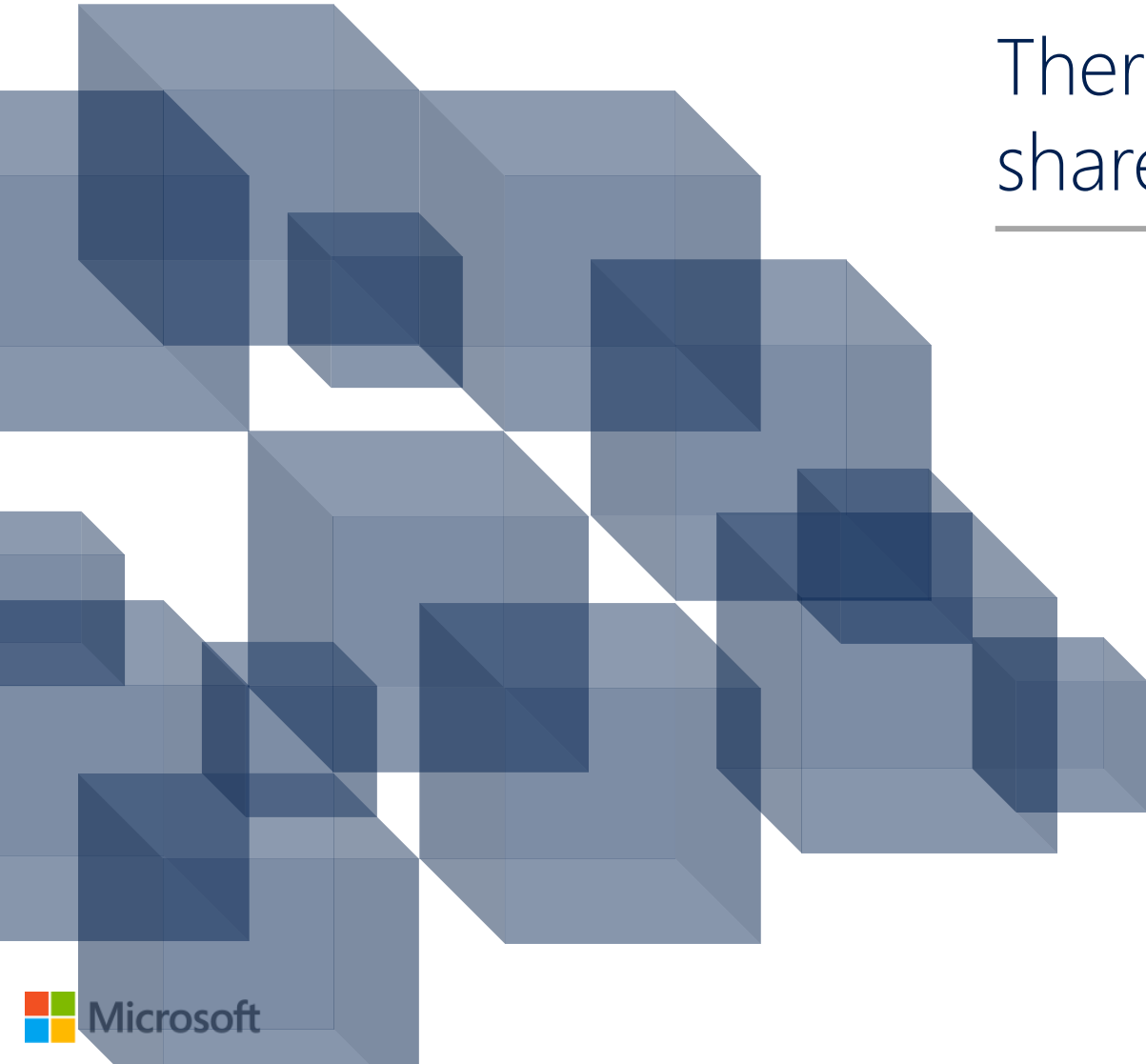
**\$280B in banking industry fines**  
since 2009

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**\$21B cost of tax return fraud** in the U.S.

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**48M illnesses from contaminated food**  
in the U.S. each year



# Building trust outside of your organization is valuable



*The truth is there is a high cost to a bad reputation.*

**DARA KHOSROWSHAHI, UBER**



*Our reputation is more important than the last hundred million dollars.*

**RUPERT MURDOCH**

**And losing it can have serious consequences:**

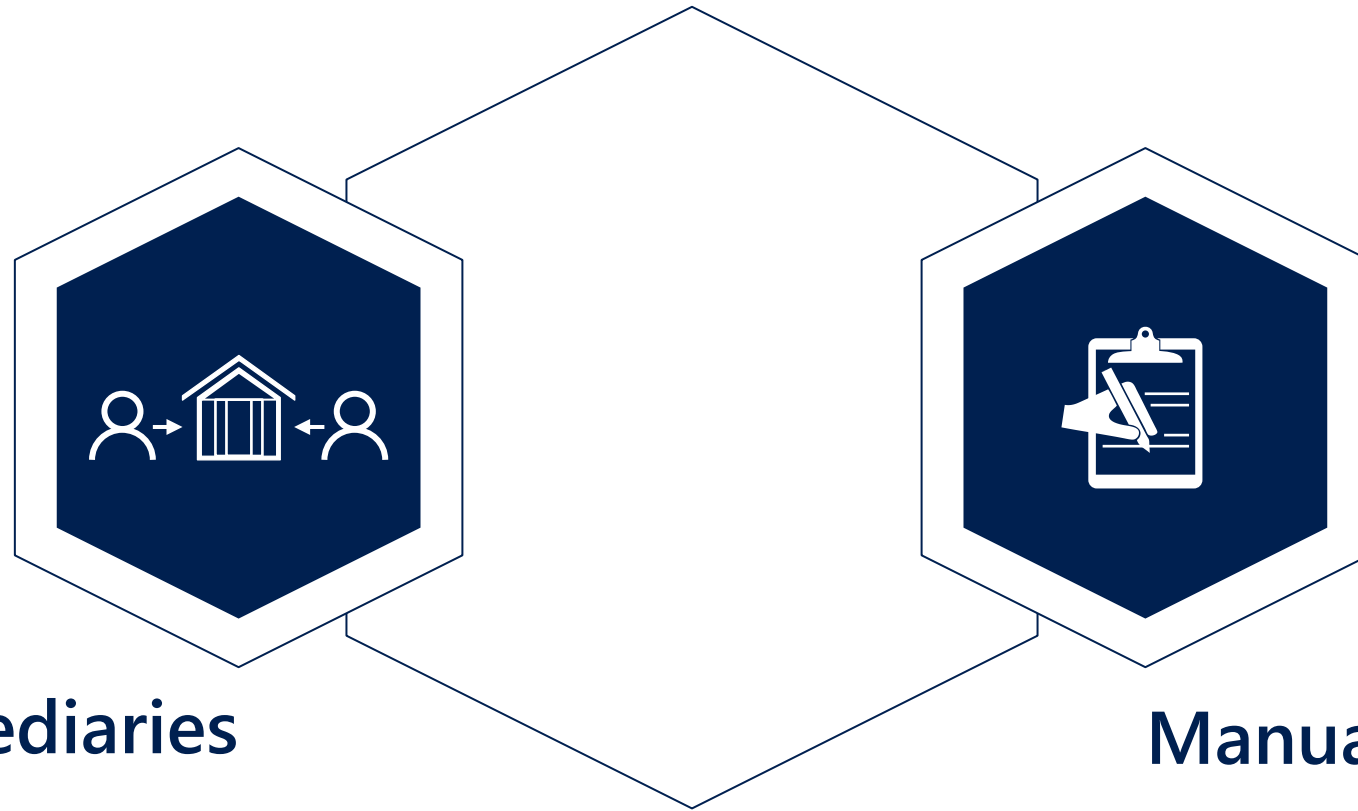
**25% decline**

In U.S. peanut butter sales following a 2009 salmonella outbreak

**34% loss**

Of then-current consumer confidence following Note 7 recall

# Traditional methods of establishing trust across organizations are inefficient



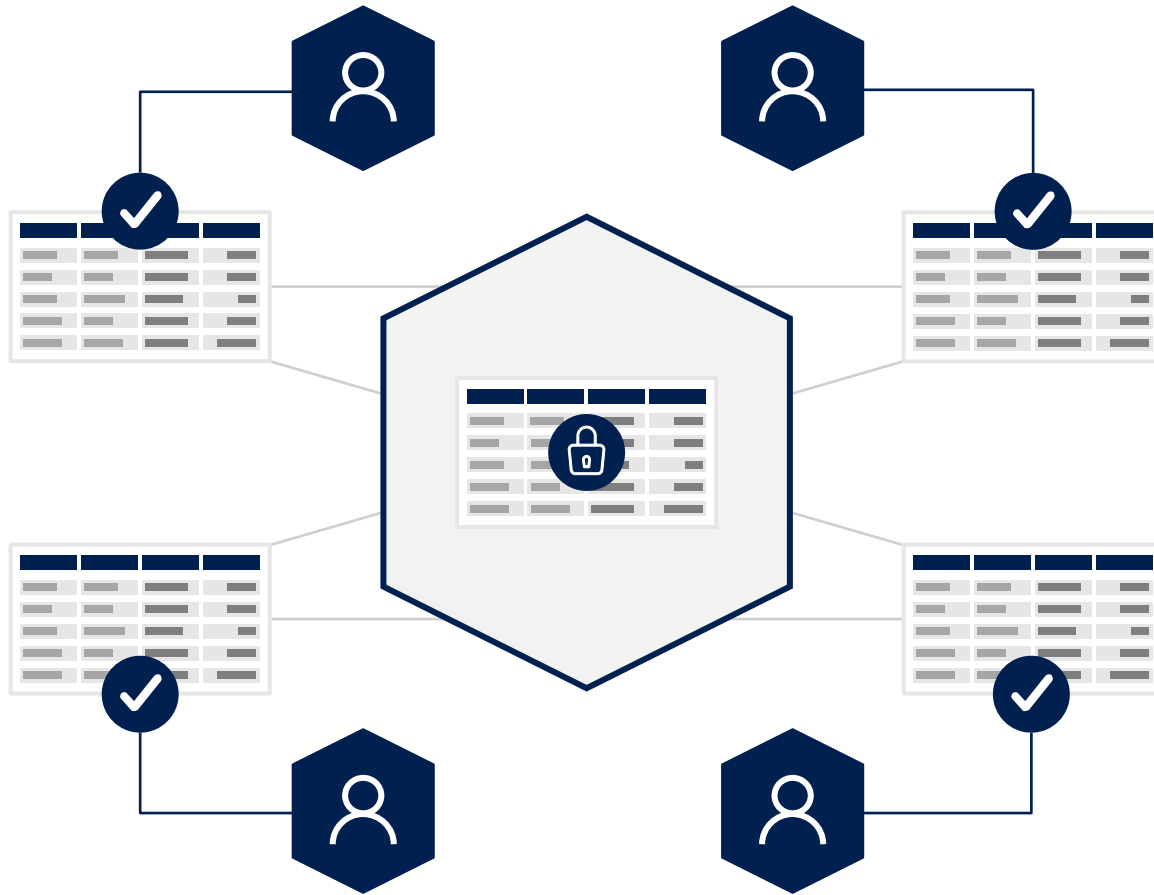
## **Intermediaries**

increase cost and reduce  
direct contact with  
consumers

## **Manual verification**

is time-consuming  
and error-prone

# Blockchain establishes a secure, shared source of truth



| Data is stored in a ledger—a record of every transaction

| Everyone in the network has an individual, identical copy

| The ledger can only be updated by network consensus, and information can't be altered or deleted without the knowledge of the whole network.

# Do I need a Blockchain?

Answering a few questions can determine if blockchain is appropriate

*Is this a business process that crosses trust boundaries?*

*Do multiple parties manipulate the same data?*

*Are there any intermediaries that control the single source of the truth?*

*Does the process involve low-value, manual verification steps?*

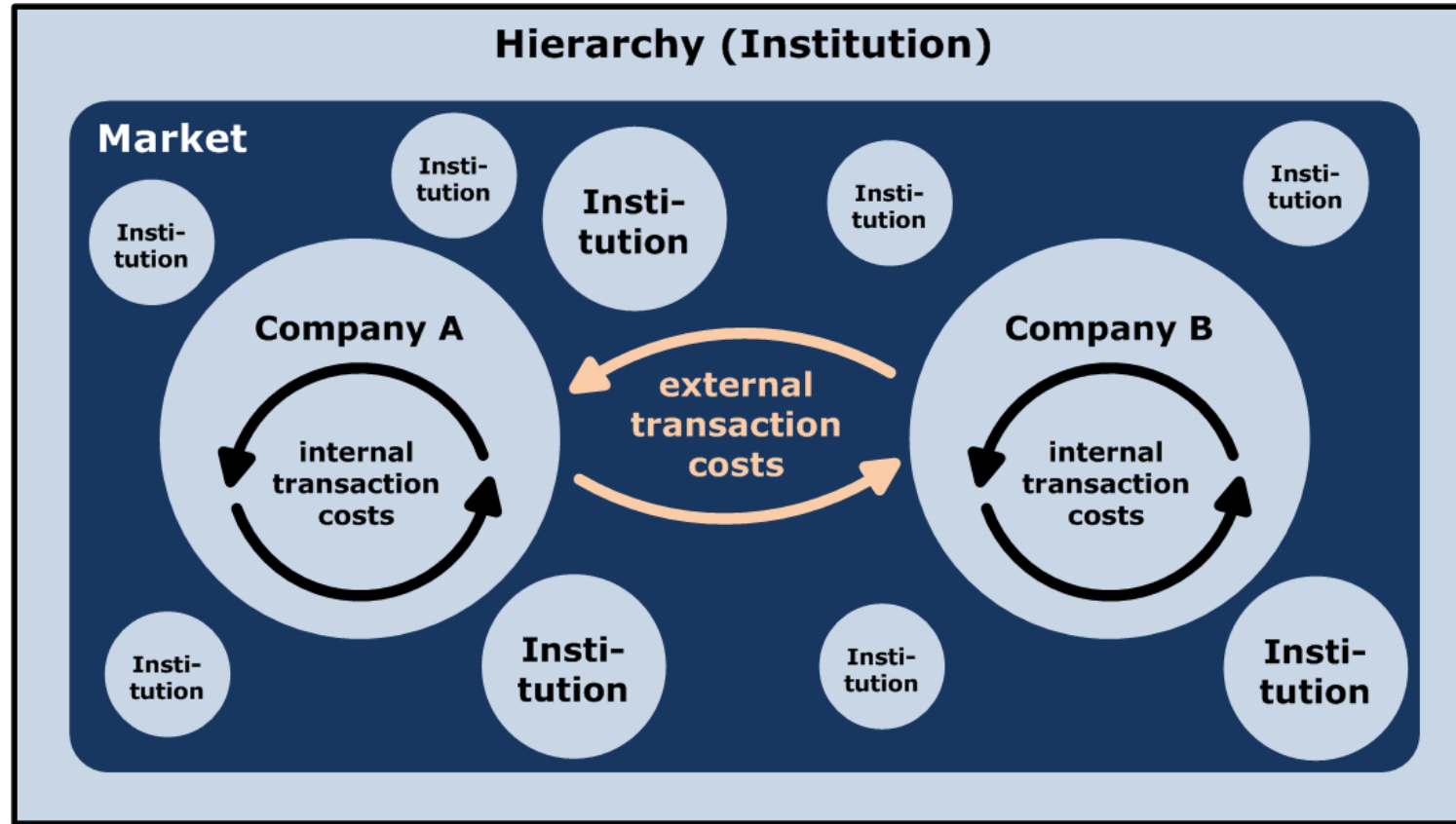




“When you form a team,  
why do you try to form a  
team? Because  
teamwork builds trust,  
and **trust builds  
speed.**”

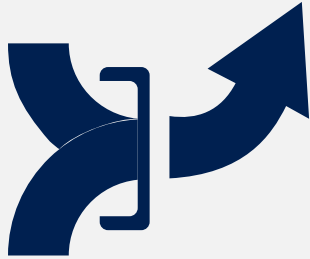
-Lt. Gen. Russel Honore, U.S. Army (ret.)

# Ronald Coase, Theory of Firm (1937)



When the external transaction costs are higher than the internal transaction costs, the company will grow. If the external transaction costs are lower than the internal transaction costs the company will be downsized by outsourcing, for example.

# There are commonalities across use cases



**Asset transfer and  
provenance**



**Cross-organizational  
workflow**



**Multiparty  
auditing**

# The types of assets vary across industries



- Ensuring supply chain integrity e.g. sensitive pharmaceuticals
- Managing movement across a complex supply chain
- Preventing tampering and counterfeit



- Improving the process for issuing bank guarantees
- Creating ease of access for guarantee beneficiaries and applicants
- Ensuring security of sensitive documents



- Facilitating thousands of hotel bookings on a daily basis
- Coordinating between many different booking systems
- Mitigating discrepancies that lead to booking errors



- Creating a system to track reward points
- Enabling system to span multiple partner organizations
- Reducing the risk of discrepancy



Asset transfer and  
provenance

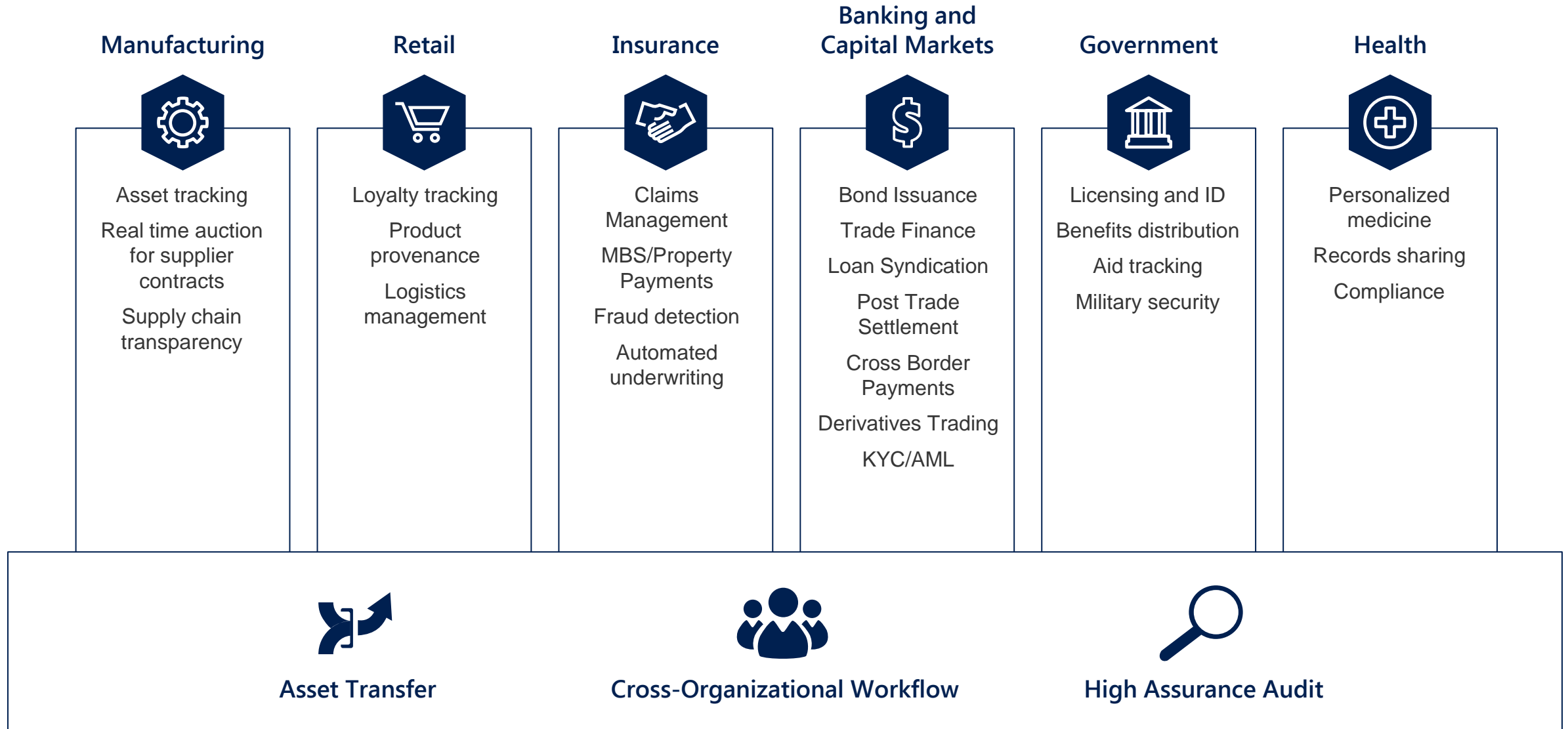


Cross-organizational  
workflow



Multiparty  
auditing

# Common use-cases share characteristics across industries



# Customers looking for similar set of outcomes



## Reduce cost

Remove friction and enable direct interaction between parties

## Mitigate risk

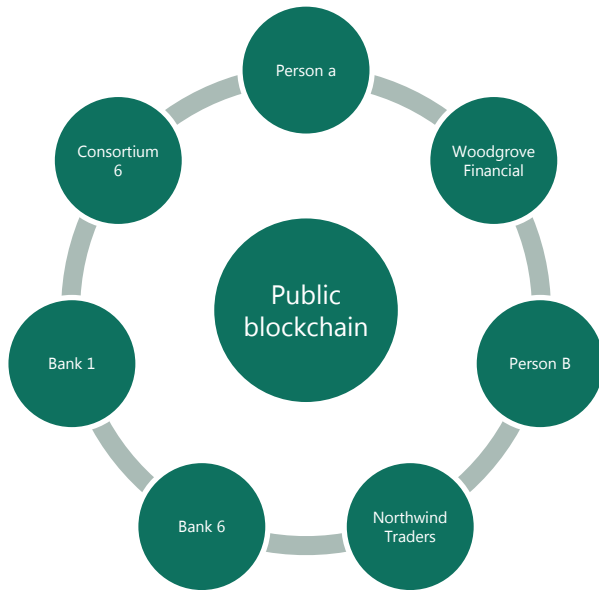
Reduce security threats from fraud, hacking, and data manipulation

## Reimagine processes

Digitize processes beyond the four walls of your own business to reshape market dynamics

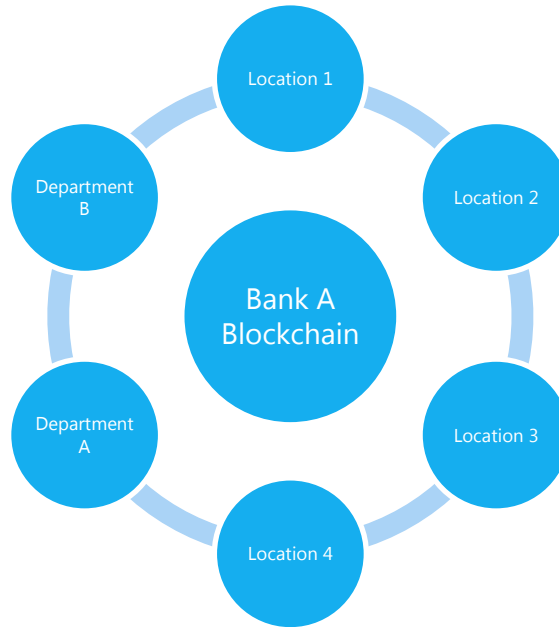
# Types of Blockchain networks

## Public



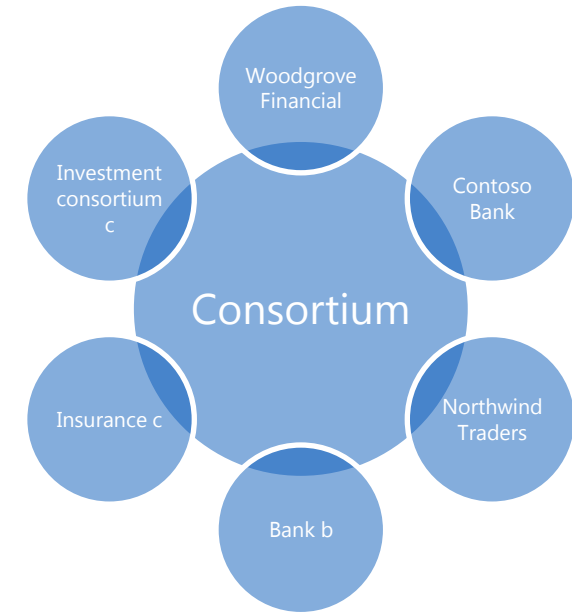
- Trustless Network
- All transactions are visible
- Example – Bitcoin

## Private



- Deployed to an Internal network
- Access can be locked down or permissioned
- Example – Cross Organization information sharing

## Consortium



- Multiple organizations coming together to form a trust network
- Access can be locked down and permissioned
- Example – Trade Finance/B2B



# Guarantees in RE Purchase

## The need

The traditional bank guarantee process for large purchase like real estate is laborious and slow. Physical documents can be lost or destroyed.

## The impact

A blockchain-enabled platform streamlines the guarantee process and improves customer satisfaction overall by enabling:

- Secure collaboration on digital documents
- Minimized need for in-person meetings
- A much shorter process overall





# Trade Finance

## The need

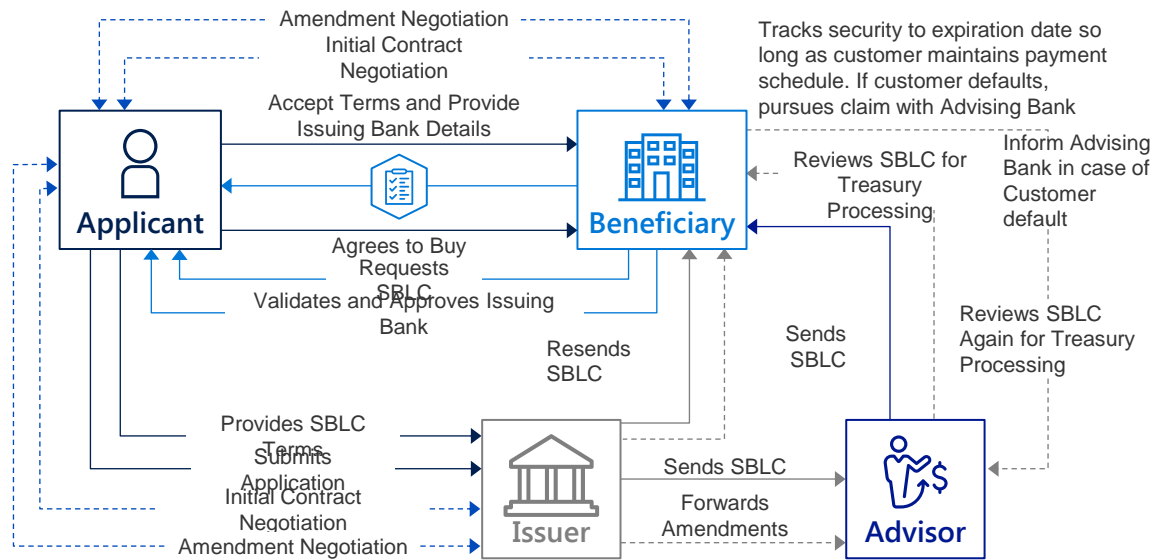
The traditional process to assess creditworthiness and issue credit to partner-sellers took several weeks and involved many manual verification steps. This process made it difficult for sellers to operate effectively, which could have serious financial impacts.

## The impact

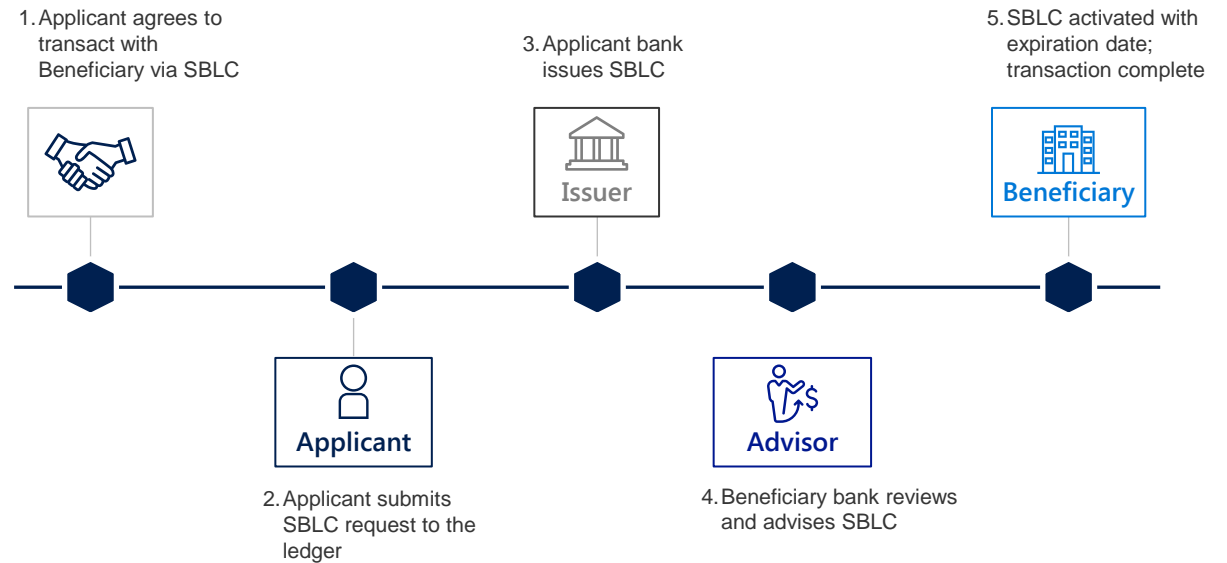
Microsoft Treasury was able to digitize and automate the credit assessment process, cut approval time to just a few days, reduce counterparty risk, enhance audit transparency, and improve predictability of working capital.



# Shared data simplifies processes like issuing a letter of credit



Old process: 3-5 weeks



New process with blockchain: 3-5 Days

“By working with Bank of America Merrill Lynch on cloud-based blockchain technology, we aim to increase efficiency and reduce risk in our own treasury operations

– Amy Hood, chief financial officer at Microsoft



# Maritime Insurance

## The need

Marine insurance is one of the least efficient categories of insurance. There are so many factors that could go wrong, it can be difficult to accurately assess risk, so insurance is often managed through a complex web of underwriters. Lack of visibility also meant that it could take years to settle claims.

## The impact

Using blockchain, insurers have real-time visibility into a ship's location and cargo condition, making it much easier to accurately assess risk. This opened up the potential for a new service line in maritime insurance, and can reduce the claims settlement process to just a few hours.



**MAERSK**

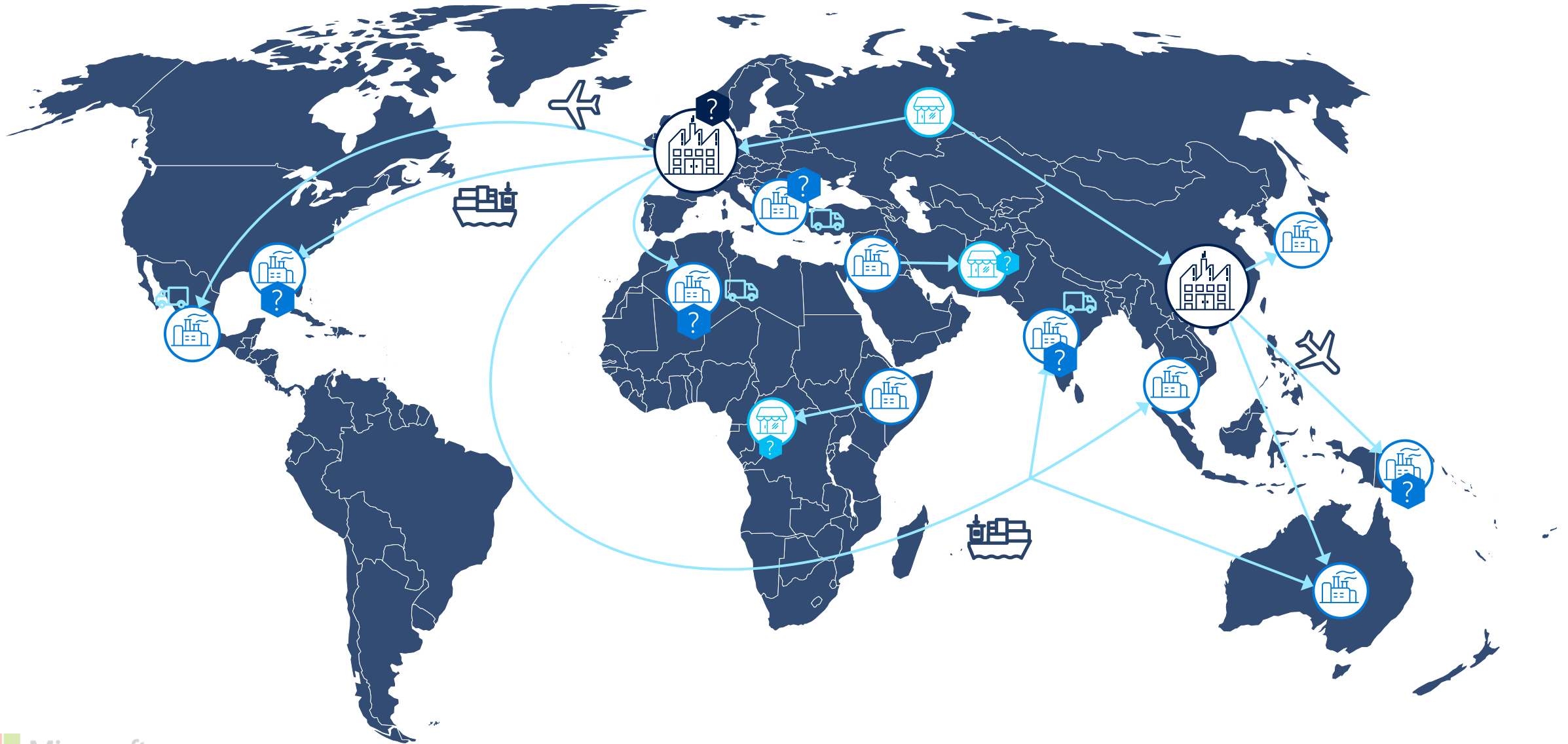


Let's imagine a food contamination scenario





# Blockchain becomes a shared source of truth across parties



# Supply Chain

## The need

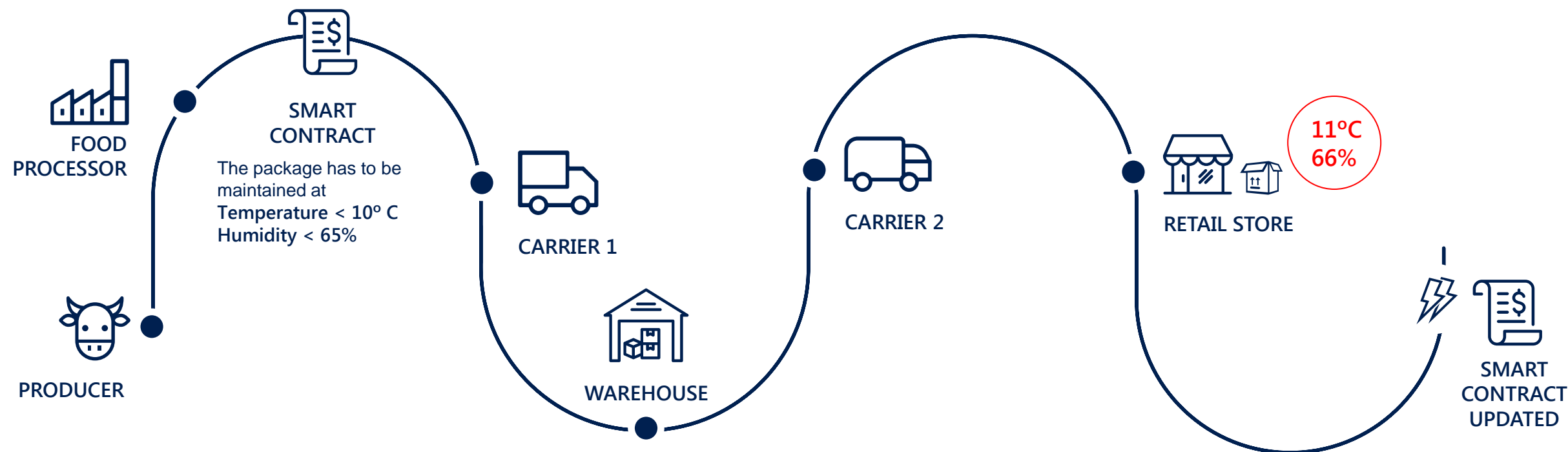
Improve product tracking and traceability of products, and identify the potential costs, benefits and issues for participants along the export supply chain including manufacturer, transporter, forwarding agent, port operator, shipping company, importer and distributor.

## The impact

Nestle has teamed up with Microsoft Digital to pilot an IoT-enabled solution that tracks the movement of its famous and delicious Bacio Perugina chocolate along the supply chain.



# Shared data simplifies processes like supply chain management



## SHARED LEDGER

📍 **Origin**  
8°C  
60%

🐄 Milk producer supplies Milk to Food Processing Company

🏭 The milk product is sealed in an IoT enabled package for shipping

📄 The terms of shipping are registered using a **smart contract** on the Blockchain

📍 **Warehouse**  
9°C  
64%

Carrier 1 delivers milk to Warehouse 1. The temperature of the package is within prescribed limits on arrival.

📍 **Carrier 2**  
9°C  
64%

The package is still within prescribed temperature limits when Carrier 2 arrives to retrieve it for delivery to Retail Store.

📍 **Store**  
**11°C**  
**66%**

**The conditions of the contract have been violated.** Carrier 2 is liable for penalty as the temperature of the package when it reached the retail store was above the prescribed limit

# Today, you can codify a workflow as a smart contract

NEW/USED	YEAR	MAKE / MODEL	ODOMETER
Used	2007	FORD Focus ZX4 S	45245
LIC. NO. A1D5484			

The words "our," "we" and "us" refer to the creditor/seller in this contract, or upon any in this contract. We sell you the motor vehicle described above on credit. The credit price you agree to buy the vehicle on credit and pay the Total Sale Price according to the terms each is together and individually responsible for all agreements in this contract.  
SEE OTHER PAGES FOR ADDITIONAL TERMS AND AGREEMENTS.

A.		FEDERAL TR
<b>ANNUAL PERCENTAGE RATE:</b> The cost of your credit as a yearly rate.	<b>FINANCE CHARGE</b> The dollar amount the credit will cost you.	<b>Amount</b> The amount to you on
21.533 %	\$ 2,553.84	\$

B.	YOUR PAYMENT
Number of Payments:	Amount of Pa
One Payment of	\$500.00
One Payment of	
One Payment of	
47	\$156.83
One final payment	

C.	
	\$

**SECURITY:** You are giving a security interest in the vehicle. If any payment is more than 10 days late you will lose the vehicle.  
**PRE-PAYMENT:** If you pay early, you may be eligible for a refund of the contract for any additional information about the scheduled date and prepayment refunds.

I, Daniel Sullivan (Signature)  
I, Janet K Sullivan (Signature)

MORTGAGE OFFICER:  
DANIEL S. SULLIVAN  
Individually  
JANET K. SULLIVAN  
Individually

Blockchain for Enterprise

## Variable Items

% Rate  
Payment Amount



## Static Items

Payment Date | Late Date | Term  
Assets or Security | Amount Financed  
Total Sale

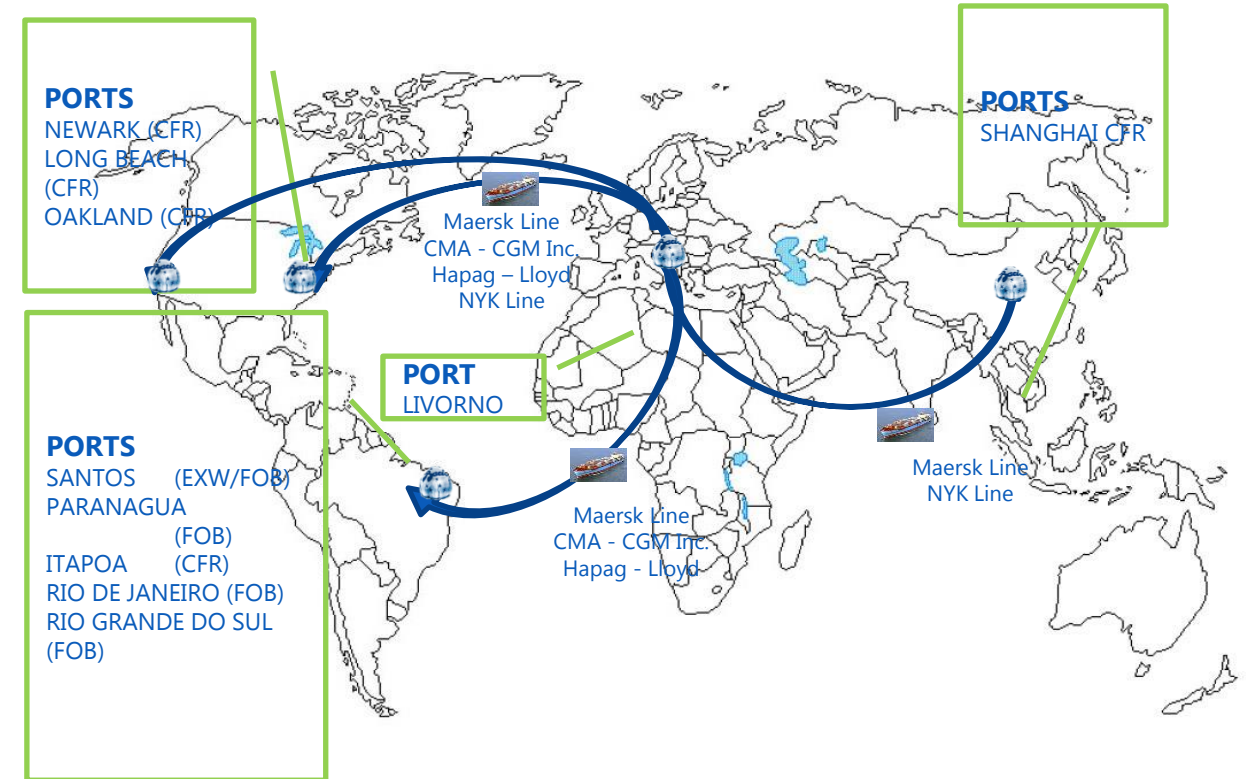
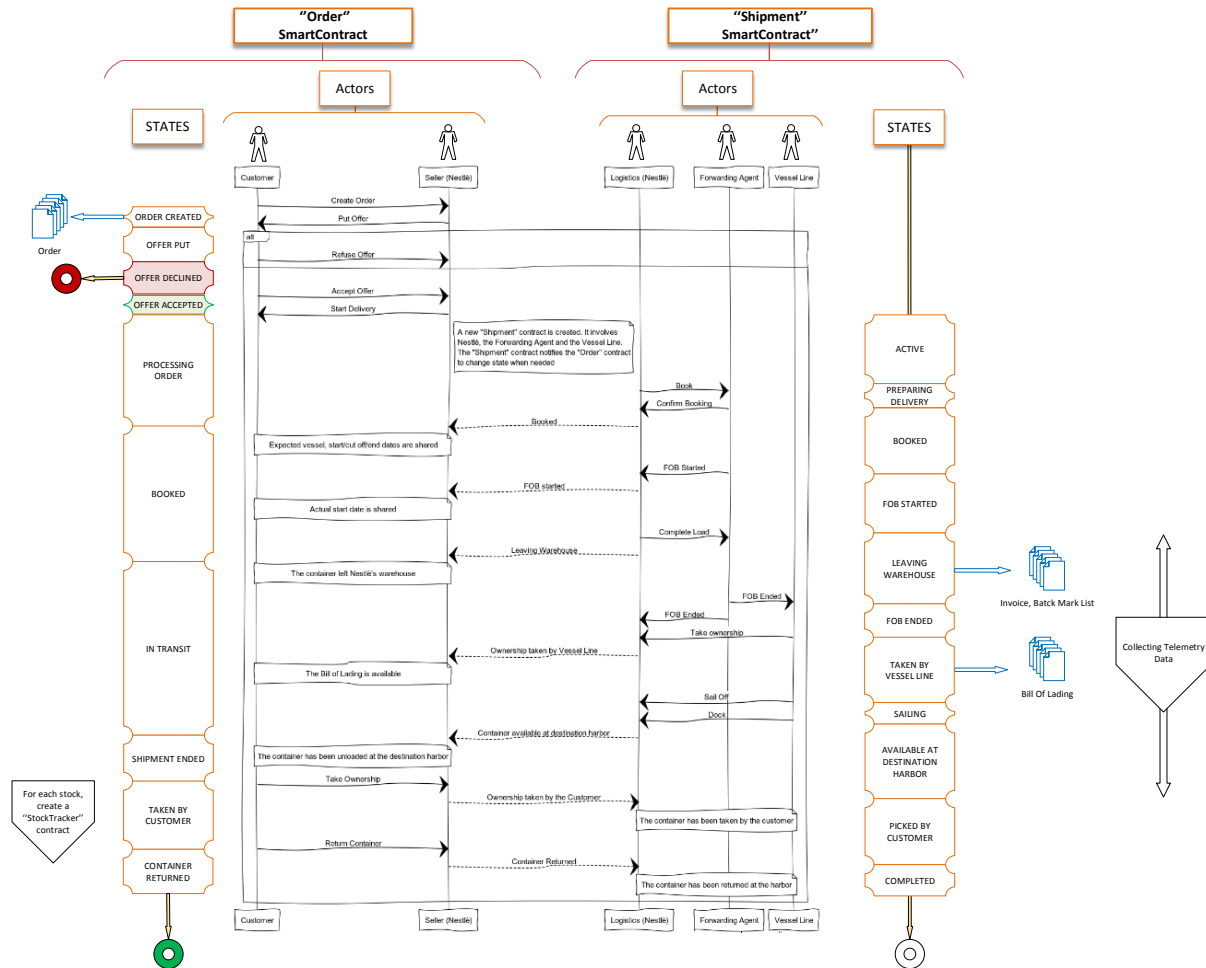
## Payments & Fees Recorded in Ledger

Date	Payment	Late Fee
12/1/16	\$500.00	\$0
1/1/17	\$500.00	\$0



# What we have done:

Nestlé Italiana implemented with Microsoft a POC on the Baci Perugina Export flow



# POC Principles



First movers, pioneer mindset



Platform openness, scalability and interoperability



Involving people from different segment of the value chain (cross functional)



Tactical approach (hands on a piece of the process)



Exploring with partners, starting engaging (Maersk) and evaluating the standards (GS1)

# POC Value



Nestlé Italiana maturity and awareness increased

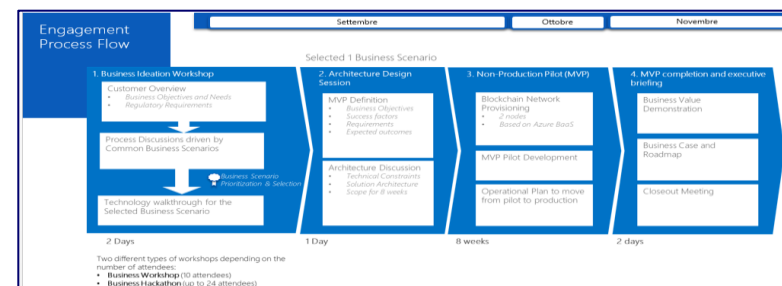


Agile process, tight schedule, respected



Two-fold journey: strategic to build ecosystem in advance, tactical to prove value

Level 4 1%	Multiple, well defined scenarios Multiple years of Blockchain experience Operations and support processes well defined Seeking early access and technical guidance for platform features
Level 3 4%	Target scenario well defined Some Blockchain experience Operations and support processes may be defined Seeking help with a Production Pilot
Level 2 15%	Potential scenario(s) identified Limited Blockchain experience Operations and support processes not defined Seeking help with a Minimal Viable Product (MVP) POC
Level 1 80%	Scenarios not identified No Blockchain experience Operations and support processes not defined Seeking education and strategy for business and IT



What is Azure  
building?

# Blockchain wasn't built for enterprise

## **Ledgers designed for public networks**

Lack the performance, confidentiality, and governance capabilities needed for commercial use

## **Smart contracts demand bespoke development and new skills**

Not designed to leverage existing enterprise tools and skill sets

## **Integration is difficult and costly**

Connecting to existing IT architecture requires significant investment

# So Microsoft focused on addressing developer challenges

We've heard  
developers say:



“

We have a workflow we want to model on blockchain, but it would take us **months of development time and hundreds of thousands of dollars** to create a PoC

“

It's difficult to **connect to our existing IT infrastructure**, and our blockchain application sits on an island

“

Our company is unsure of **which vendors will be around for the long haul**, what products they have, and how they will support our strategic direction

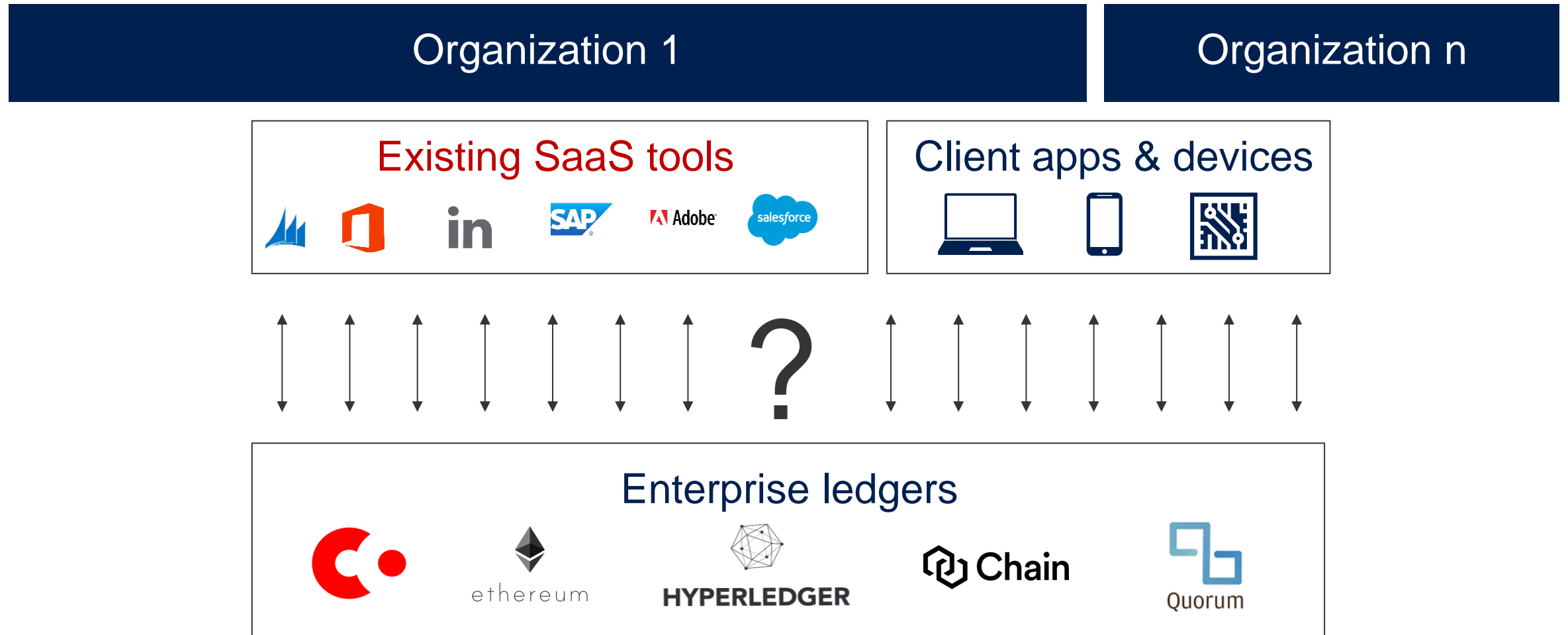
I'm spending all of my time **scaffolding together an infrastructure**, not writing smart contracts

”

Blockchain isn't an option for us, because we would have to put **sensitive data on an insecure platform**

”

# It's hard to bridge the gap and deploy blockchain in your business



# Because building an end-to-end blockchain app is a huge undertaking





So we've taken steps to create a platform that would tackle those challenges



# We started by populating modular preconfigured templates and infrastructure

## Ledger and topology choice



ethereum



**HYPERLEDGER**



**Chain**



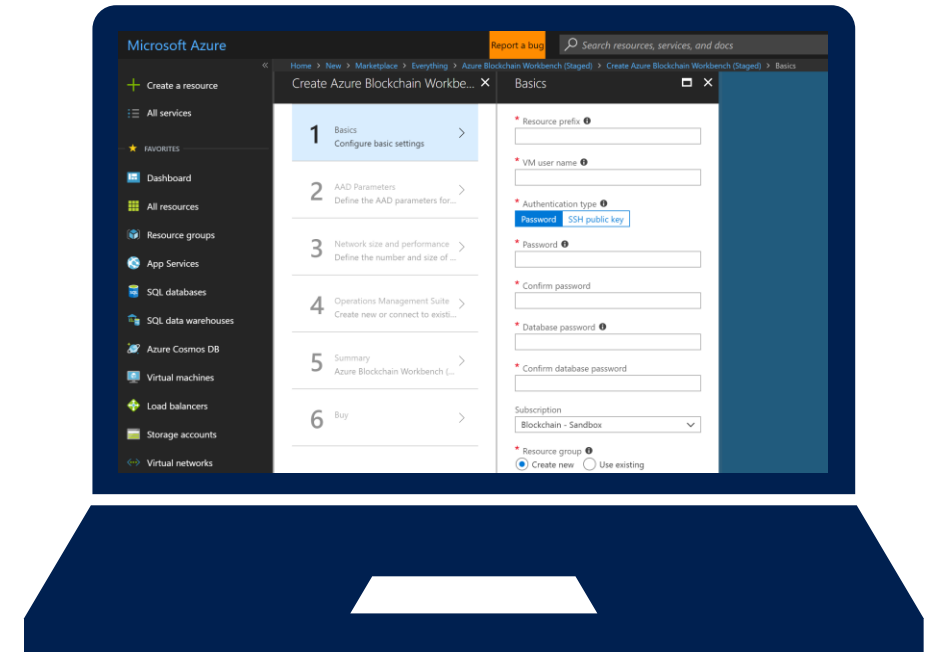
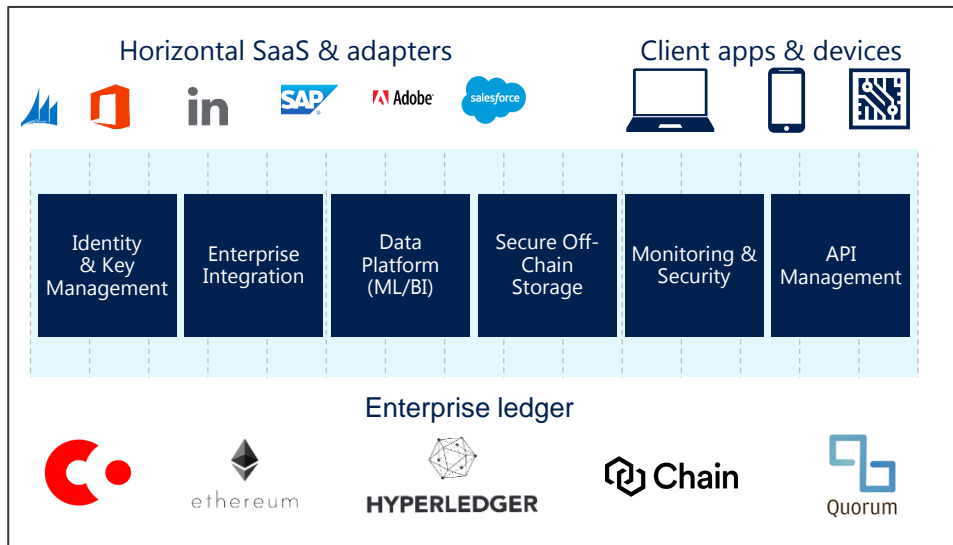
Quorum

**Choose the ledger** that meets your needs

**Deploy on flexible topologies** (dev test, single-node, or multi-node) so you can expand when you're ready

# Now, we've built a simple interface for deploying these services and authoring smart contracts

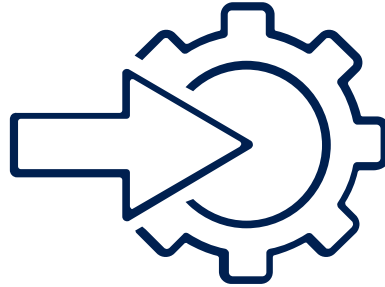
## Azure Blockchain Workbench



# Azure Blockchain Workbench offers significant benefits to developers



**Simplify**  
development



**Accelerate**  
time to value



**Innovate**  
with confidence

# So you can focus your time on adding value for your business



# Announcing the Coco Framework for enterprise blockchain networks

Posted on August 10, 2017



[Mark Russinovich](#), CTO, Microsoft Azure



## The Coco Framework

Powered by  Microsoft

Thank you