Blockchain will do for secure transactions what the internet did for information.

Ginni Rometty, CEO of IBM at SIBOS September 2016
IBM

- Systems and Technology Group
- Global Technology Services
- Integrated Operations

- Software Group

- Global Business Services
  - Digital Strategy and Innovation
  - Cognitive Process Transformation
    - ...
    - Blockchain Practice
      - ...
  - Cloud Application Innovation

- Sales and Distribution
Hyperledger, A Linux Foundation Project

- A collaborative effort created to advance cross-industry blockchain technologies for business
- Announced December 2015, now over 140 members
- Open source, open standards, open governance
- One active framework (“Fabric”) and seven projects in incubation
- IBM is a premier member of Hyperledger

www.hyperledger.org

Brian Behlendorf
Executive Director

Blythe Masters
Board Chair

Chris Ferris
TSC Chair
Hyperledger Fabric: built for Cross-Industry use in regulated businesses from the ground up

**Confidentiality**

- **Partitioned execution**
  - Optimize network performance by separating chaincode execution and transaction ordering

- **Permissioned membership**
  - Operate a trusted blockchain network with known participants and regulatory oversight

- **Channels**
  - Enable multi-party transactions with the privacy and confidentiality needed for regulated industries

**Production Workloads**

- **Transaction history**
  - Searchable transaction history for efficient auditing and dispute resolution

- **Network tools**
  - IBM provides tools for monitoring, logging, and for compliance reasons backup/restore

- **Modularity**
  - Select preferences for number of peers, consensus, identity management, and encryption to dynamically grow a business network
Contents

What is Blockchain?

Why is it relevant for our business?

How can IBM help us apply Blockchain?
Problem …

… inefficient, expensive, vulnerable
A shared replicated, permissioned ledger…

… with consensus, provenance, immutability and finality
Requirements of blockchain for business

Append-only distributed system of record shared across business network

Shared ledger

Smart contract

Ensuring appropriate visibility; transactions are secure, authenticated & verifiable

Privacy

Trust

Business terms embedded in transaction database & executed with transactions

Transactions are endorsed by relevant participants
Contents

What is Blockchain?

Why is it relevant for our business?

How can IBM help us apply Blockchain?
Blockchain benefits

Saves time
Transaction time from days to near instantaneous

Removes cost
Overheads and cost intermediaries

Reduces risk
Tampering, fraud & cyber crime

Increases trust
Through shared processes and recordkeeping
Key players for Blockchain adoption

**Regulator**
- An organization who enforces the rules of play
- Regulators are keen to support Blockchain based innovations
- Concern is systemic risk – new technology, distributed data, security

**Industry Group**
- Often funded by members of a business network
- Provide technical advice on industry trends
- Encourages best practice by making recommendations to members

**Market Maker**
- In financial markets, takes buy-side and sell-side to provide liquidity
- More generally, the organization who innovates
  - Creates a new good or service, and business process (likely)
  - Creates a new business process for an existing good or service

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Maersk – Streamlining Global Trade
Global Financing: Dispute Resolution

Over 4,000 Suppliers and Partners Worldwide
25,000+ Disputes Every Year

Today’s Systems
- Approximately $100 million tied up at any given time
- 44 days on average to resolve
- $31,000 average disputed invoice value

Blockchain

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Food Traceability in China

What?
• Traceability of food from “farm to fork”

How?
• Blockchain holds history of food items processed through entire supply chain

Benefits
1. Increased trust – multiplied by each participant in food supply chain
2. Pinpoint source of compromised food, reducing the unnecessarily broad recall
3. Improved co-ordination in food supply chain
## Selected References

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<th>Settlements through digital currency</th>
<th>Identity management</th>
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**Low liquidity securities trading and settlement**

**Cross Border Supply Chain**

**Contract Management**

Food Safety

Private Equity

Channel Financing
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Potential use cases
Further examples by (selected) industry
Contents

What is Blockchain?

Why is it relevant for our business?

How can IBM help us apply Blockchain?
How IBM can help

Technology

Hosting and Support

Making blockchain real for clients
IBM Blockchain: High Security Business Network Plan

Business network running on dedicated high security compute

Key Capabilities:

**Dedicated Compute**
Four connected peers and a CA in an isolated partition on dedicated compute

**Secure Service Container**
Protection from horizontal and vertical tampering with all code running in a secure virtual appliance

**SecureKey and HSM**
On board HSM with tamper resistant cards providing up to FIPS 140-2 Level 4 security

**Performance Optimized**
Crypto acceleration, high speed network all running on the world’s fastest Linux system
IBM Engagement model overview

**Let’s Talk**
1. Discuss Blockchain technology
2. Explore customer business model
3. Show Blockchain Application demo

**Blockchain Hands-on**
1. Understand Blockchain concepts & elements
2. Hands on with Blockchain on Bluemix
3. Standard demo customization

**First Project**
1. Design Thinking workshop to define business challenge
2. Agile iterations incrementally build project functionality
3. Enterprise integration

**Scale**
1. Scale up pilot or Scale out to new projects
2. Business Process Re-engineering
3. Systems Integration

Remote | Digital | Face to face | Face to face
Continuing your education journey...

Explained
- What is blockchain for business
- Why is it relevant
- What is IBM doing

Solutions
- Use cases, patterns and references
- How IBM can help

Composed
- What is Hyperledger Composer
- Assets, transactions & participants

Architected
- Learn key blockchain technical concepts
- Designing a solution

Explored
- Technical deep dive on Linux Foundation Hyperledger Fabric
- Covers V1 content

Next Steps
- How to proceed with a first project
- Design Thinking Workshop logistics
Thank you!

www.ibm.com/blockchain
developer.ibm.com/blockchain
www.hyperledger.org
Further Information – Use case Links

## Alternatives

<table>
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<tr>
<th>Description of Platform</th>
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<th>Currency</th>
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<th>‘Solidity’ programming language</th>
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