Blockchain on Supply Chain Finance

Logistics meets Innovation

Collaboration in Logistics: from Blockchain to the Physical Internet
**IntellectEU**

**Company Profile**

- **10+** Years of financial integration experience
- **20+** Countries - worldwide implementation
- **200+** Integration projects
- **70 ppl** Global coverage with highly skilled professionals

Linux Foundation’s Hyperledger Project
Founding member of since 2016

IBM
Blockchain Ecosystem Partner since 2016
Business Partner since 2016

Oracle
Oracle Blockchain Cloud Services Partner 2017

Swift
Integration Partner since 2013
Service Partner since 2009
Solution Partner since 2007

HQ
Belgium

Offices
United States, Ukraine, Portugal (2) and Mexico
Technical expertise
SWIFT Integration Services

- Back Office Integration
  - SWIFT Integration Layer (SIL)
  - SWIFT Alliance Access Integration Platform (IPLA)
- Messaging Interface
  - SWIFT Alliance Lite2 Implementation (Basic set-up and Turn-key set-up)
  - SWIFT Alliance Lite2 Support (POM, mini-POM)
  - Alliance Messaging Hub (AMH)
- Trainings for SWIFT Users
  - On-site training
  - Off-site support after training

- Systems design, configuration and administration
- Script development and implementation
- Installation of system software and banking apps, testing
- Performance monitoring, capacity planning, analyzing and system tuning
- Working with customer requests, managing incidents, problems, changes
- Communication with SWIFT, participation in audits
## Technical expertise
### Financial Integration Services

<table>
<thead>
<tr>
<th>Standards</th>
<th>ISO 20022, ISO 15022, FIX, EDI.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocols</td>
<td>JMS, FTP, SMTP/IMAP, IBM MQ, REST, SOAP, IDOC (SAP).</td>
</tr>
<tr>
<td>Networks</td>
<td>Blockchain, SWIFT, Fed, FIX, CHIPS, Target2, SARIE, EBICS.</td>
</tr>
<tr>
<td>Applications</td>
<td>SAP, SWIFT Alliance Access, Oracle, TemenosT24, FlexCube, TurboSWIFT, Quantum, Olympic, Tax/Mint, Google Enterprise, Salesforce</td>
</tr>
</tbody>
</table>
Blockchain integration services

- Platforms
- Implementation
  - Vertical solutions
  - Custom use cases
  - Proof of Concepts and MVPs
- Integration
  - Financial integration - SWIFT Integration
  - Back office applications
  - Legacy systems
  - Compliance with Industry Standards, Formats & Protocols

Oct 2016: Amsterdam Hackathon
**Agenda**

18h40 – 19h20

- **History** behind Blockchain,
- **key features** of Blockchain,
- current **status quo**
- and **opportunities** out there

- Bitcoin, Blockchains and Distributed ledgers
- Differentiating factors
- Technology and platforms
- Applications in different markets

“The electric light did not come from the continuous improvement of candles.” - Oren Harari
Bitcoin, Blockchains and Distributed ledgers

1990-1998
DigiCash – David Chaum
- eCash: electronic money

1998
B-Money - Wei Dai
- anonymous, distributed electronic cash system
- Double spending

Nov 2008
Bitcoin – Satoshi Nakamoto
- P2P network
- Ajuste automático do proof of work

2013
Ripple – David Schwartz
- distributed open source Internet protocol
- consensus ledger
- native currency
- Trusted nodes
- Aproximação ao setor bancário

2014
Stellar – Jed McCaleb
- distributed open source Internet protocol
- consensus ledger
- native currency

1997
Hashcash
- Proof of work algorithm for email spam prevention

1998
bitGold - Nick Szabo
- Smart contracts

2011 em diante
- Namecoin
- Litecoin
- Monero
- Dash
- Dogecoin
- Peercoin
- 650+

2013
Ethereum - Vitalik Buterin
- blockchain-based distributed computing
- Decentralized virtual machine
- Smart contracts

2015
Linux Foundation
Hyperledger
- Data Privacy
- Consensus mechanism protection

Recommended link - Princeton Online course: Bitcoin and Cryptocurrency Technologies
Bitcoin, Blockchain and Distributed ledgers

2 min video from World Economic Forum Jan/2017: What is blockchain?

Drivers:
• OPEX Reduction & Risk mitigation
• New business models

Transactions are cryptographically signed

Every node has a copy of the ledger
Roles (e.g. hyperledger)

Source: http://www.coindesk.com/state-of-blockchain-q1-2016/
Differentiating factors

- Immutable records
- Privacy
- Distributed with no need for 3rd trusted party
- Consensus mechanism
- Programmable rules (smart contracts)

What's new?

- Low settlement cost
- Risk reduction
- Transparency
- Single source of truth
- Increased resiliency – no single point of failure
# Technology and platforms

<table>
<thead>
<tr>
<th>PUBLIC BLOCKCHAINS</th>
<th>ENTERPRISE BLOCKCHAINS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethereum</td>
<td>ripple</td>
</tr>
<tr>
<td>Bitcoin</td>
<td>Hyperledger</td>
</tr>
<tr>
<td>Litecoin</td>
<td>c-rda</td>
</tr>
<tr>
<td>public (inter-)</td>
<td>private (intra-)</td>
</tr>
<tr>
<td>The Internet</td>
<td>Intranets &amp; IT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PUBLIC</th>
<th>ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS</td>
<td>Open read/write</td>
</tr>
<tr>
<td>SPEED</td>
<td>Slower</td>
</tr>
<tr>
<td>SECURITY</td>
<td>Open computer network</td>
</tr>
<tr>
<td>IDENTITY</td>
<td>Anonymous / Pseudonymous</td>
</tr>
<tr>
<td>ASSET</td>
<td>Native assets</td>
</tr>
</tbody>
</table>

SOURCE: https://www.coindesk.com/research/state-of-blockchain-q3-2016/
ENTERPRISE BLOCKCHAINS
ENTERPRISE ETHEREUM ALLIANCE

7 new working groups
- Newly formed working groups spanning diverse industries
  - Tokens
  - Banking
  - Healthcare
  - Insurance
  - Advertising
  - Legal
  - Supply Chain
- In addition to a technical steering committee

World’s largest open source blockchain initiative
- Total memberships crosses 150 organizations just 6 months after launch

Data Source: Enterprise Ethereum Alliance

ENTERPRISE BLOCKCHAINS

HYPERLEDGER

[Diagram showing various case studies and PoCs for Hyperledger]

- **Hyperledger Fabric**
  - **PoCs:**
    - *Trade Finance*: 7 European banks working with IBM to build a trade finance platform for small- and medium-sized enterprises.
    - *International Transactions*: SWIFT, 6 global banks.

- **Hyperledger Iroha**
  - **PoCs:**
    - *Central Banking*: National Bank of Cambodia working with Soramitsu.

- **Hyperledger Burrow**
  - **Interoperability:** Working to get the Ethereum Virtual Machine running on Sawtooth Lake.

**A glimpse into Q3:**
Hyperledger Fabric launches live.

**Stock Exchange:**
- Santiago Stock Exchange, Latin America's third-largest stock exchange, working with IBM.
- TMX

**Case Studies:**
- *Sawtooth Lake*
  - *Seafood Supply Chain Traceability*
  - *Bond Asset Settlement*
  - *Marketplace Digital Asset Exchange*

**Data Source:** Hyperledger

Hyperledger community

• 170+ members: Banks, Technology Companies, Corporations
• 300+ contributing developers, 2000 + slack channel participants
• 80+ PoCs, 3.6M lines of code
## ENTERPRISE BLOCKCHAINS

### Comparison

#### Comparison of Ethereum, Hyperledger Fabric and Corda

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Ethereum</th>
<th>Hyperledger Fabric</th>
<th>R3 Corda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of platform</td>
<td>Generic blockchain platform</td>
<td>Modular blockchain platform</td>
<td>Specialized distributed ledger platform for financial industry</td>
</tr>
<tr>
<td>Governance</td>
<td>Ethereum developers</td>
<td>Linux Foundation</td>
<td>R3</td>
</tr>
<tr>
<td>Mode of operation</td>
<td>Permissionless, public or private*</td>
<td>Permissioned, private</td>
<td>Permissioned, private</td>
</tr>
<tr>
<td>Consensus</td>
<td>Mining based on proof-of-work (PoW)</td>
<td>Broad understanding of consensus that allows multiple approaches</td>
<td>Specific understanding of consensus (i.e., notary nodes)</td>
</tr>
<tr>
<td></td>
<td>- Ledger level</td>
<td>- Transaction level</td>
<td>- Transaction level</td>
</tr>
<tr>
<td>Smart contracts</td>
<td>Smart contract code (e.g., Solidity)</td>
<td>Smart contract code (e.g., Go, Java)</td>
<td>Smart contract code (e.g., Kotlin, Java)</td>
</tr>
<tr>
<td></td>
<td>- Ether</td>
<td>- None</td>
<td>- Smart legal contract (legal prose)</td>
</tr>
<tr>
<td></td>
<td>- Tokens via smart contract</td>
<td>- Currency and tokens via chaincode</td>
<td>- None</td>
</tr>
</tbody>
</table>

Potential of adoption

# Applications

<table>
<thead>
<tr>
<th>1. Understand</th>
<th>2. Select area</th>
<th>3. Define Use cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What is it?</td>
<td>• Banking</td>
<td>• Healthcare</td>
</tr>
<tr>
<td>• Which are the differentiating factors?</td>
<td>• Payments and money transfers</td>
<td>• Supply chain management</td>
</tr>
<tr>
<td></td>
<td>• Cybersecurity</td>
<td>• Cloud storage</td>
</tr>
<tr>
<td></td>
<td>• Academic records and academia</td>
<td>• Energy management</td>
</tr>
<tr>
<td></td>
<td>• Voting</td>
<td>• Sports management</td>
</tr>
<tr>
<td></td>
<td>• Car leasing and sales</td>
<td>• Gift cards and loyalty programs</td>
</tr>
<tr>
<td></td>
<td>• Networking and IoT</td>
<td>• Government and public benefits</td>
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<tr>
<td></td>
<td>• Forecasting</td>
<td>• Gun tracking</td>
</tr>
<tr>
<td></td>
<td>• Online music</td>
<td>• Wills and Inheritances</td>
</tr>
<tr>
<td></td>
<td>• Ride sharing</td>
<td>• Retail</td>
</tr>
<tr>
<td></td>
<td>• Stock trading</td>
<td>• Charity</td>
</tr>
<tr>
<td></td>
<td>• Real estate</td>
<td>• Law Enforcement</td>
</tr>
<tr>
<td></td>
<td>• Insurance</td>
<td>• Human Resources</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ride Hailing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complementary solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• New business models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Solve problems not addressed so far</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cost reduction</td>
</tr>
</tbody>
</table>

[https://www.cbinsights.com/blog/industries-disrupted-blockchain/](https://www.cbinsights.com/blog/industries-disrupted-blockchain/)
Blockchain approach

**Solutions**
- Invoice discounting
- Supply chain finance
- Insurance claim management
- Know your customer
- Identity management
- Document management and authentication
- Blockchain for Central Bank
- Smart correspondent banking

**Services**

**Phase 1 – Proof of Concept**
- Design Thinking
- Key use cases

**Phase 2 – Minimum Viable Product**
- Security
- Data protection
- Data segregation

**Phase 3 - Roll-out**
- Performance
- Scalability
- Availability

USE CASES DEVELOPMENT
Blockchain approach

11:00 today @Sibos in the Hyperledger booth A01 - @IntellectEU & @Oracle will demo a Supply Chain Finance Solution on Blockchain #Sibos

Supply Chain Finance Solution on Blockchain

Presented by Hanna Zubko, Co-founder, IntellectEU, Paulo Roquebri, Business Development Director, IntellectEU, and Rik de Deyn, Senior Director Banking Innovation, Oracle

IntelllectEU will demonstrate Invoice Discounting Solution based on Hyperledger Fabric that facilitates, trust, security, and transparency among participants of Supply Chain Finance process including the Buyer, Supplier, and their Bank. While Supplier improves its cashflow, the Bank gets to know the customer better; the goods on which the invoice is issued. Bank can access that information from a "token record" namely blockchain and in that sense, the Bank can mitigate risk and provide a better service to its customer(supplier company).

Also visit the Oracle booth, G91.
Invoice discounting
Challenges and requirements

Challenges
- Reconciliation issues
- Manual matching
- Human processes
- Data synchronization
- Lack of visibility
- Fraud

Requirements
- Security
- Performance
- Availability
- Scalability
- Auditability
- Compatibility with legacy

Blockchain

Trust
- Provenance

Consensus
- Finality

Immutability
- Redundancy
Invoice discounting
Solution on BCS

Abstract:
The producer gets financing over his invoice before the due date by sharing the Accounts Receivables information with the Bank.

The solution provides transparency, which means less risk to the Bank.

Benefits
- Liquidity for the vendor
- Risk Management for the Banks
Thank you!

@IntellectEU

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www.intellecteu.com