Distributed ledgers and smart contracts for enterprise use

Presentation to the ECB

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Frankfurt am Main, 22 June 2017
Historical context

- All about bitcoin (and about disruption of banks and money!)
- Blockchain – not bitcoin
- Banks (and non banks) discovering blockchain
- PoCs all over the place
  - Finance
  - Supply chain
  - Energy
  - Pharma
  - ...
- Pilots (limited scale, but real)
- Enterprise grade Blockchains needed
Recap: key aspects of blockchain

<table>
<thead>
<tr>
<th>What is a ledger</th>
<th>The problem</th>
<th>The solution: a distributed ledger</th>
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<tbody>
<tr>
<td>A database with financial commitments between parties</td>
<td>Ledgers maintained by trusted entities</td>
<td>Common ledger, including</td>
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<td>(Paper) contracts describing the rules that govern these commitments</td>
<td>Multiple ledgers =&gt; need reconciliations</td>
<td>– Common database</td>
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<td>A set of programs to reflect these contracts</td>
<td>Rules / contracts not automated, and subject to interpretation</td>
<td>– Common programs (“smart contracts”)</td>
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<td>Non-dependent on single sources of trust =&gt; maintained by the community</td>
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<td>Impossible to tamper with due to cryptography and hyper-replication – but not trust</td>
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## What makes it strategic

<table>
<thead>
<tr>
<th>Core banking systems today</th>
<th>Blockchain</th>
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<tr>
<td>Expensive</td>
<td>Cheap</td>
</tr>
<tr>
<td>Isolated</td>
<td>Open</td>
</tr>
<tr>
<td>Proprietary</td>
<td>Hyper-connected</td>
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<tr>
<td>Inflexible</td>
<td>Universal</td>
</tr>
<tr>
<td>Local</td>
<td>Flexible</td>
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<td></td>
<td>Global</td>
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... so they are ultra-secure, immutable, and compliant

... yet as secure and immutable as a traditional one (actually more!)

**Key enabler for i) efficiency and ii) innovation**
A new innovation paradigm based on digital (cryptographic) money

- No touching the core banking systems – or at little as possible
- Build solid tokenization technology and interact through existing APIs => represent (fiat) assets on Blockchains and smart contracts (cash, bonds, shares, etc.)
- Money is then digital, and segregation of (digital) funds is done on smart contracts
- Use this digital money to i) implement existing services at a fraction of the cost, and ii) innovate new services enabled by blockchain

=> Blockchain as an extension of the bank’s ledger
=> Integration with existing core banking systems is utterly cheap and simple
=> Money is digital, programmatic and interactive
=> Innovating using this digital money, instead of core systems
Why an Enterprise Ethereum Alliance

• Opportunity / need to use blockchain in enterprise settings

• Ethereum as the “de facto” standard (technology ready, large developer community, versatile technology)

• Multiple, disjoint efforts from corporations to add
  ✓ Scalability
  ✓ Privacy
  ✓ Resiliency
  ✓ Easiness to use

EEA launched in Feb 2017 as a collective effort to:
  – Set standards
  – Create reference implementations
  – Share practices
  … but not a consortium!
  … and no commercial interest!
Guiding principles

**At will:** member led, no top down decisions

**Standards,** not products

**Compatible:** with public Ethereum and existing standards

**Inclusive & collaborative,** not competitive: “co-opetition”

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*Inspired in the Ethereum philosophy / governance ... but at enterprise level*
Who launched the EEA

Initial board:
- Santander (Julio Faura, chair)
- JP Morgan
- BoNY (Alex Batlin, chair technical SC)
- CME (Sandra Ro, treasurer)
- Microsoft
- Intel
- Accenture (David Trait, vice-chair)
- Consensys
- Nuco
- BlockApps
- The Institutes
Progress to date

- Established structure and initial operations
- Created, organized and launched working groups:
  - Technical (including standards, benchmarking and ops)
  - Banking, Identity, Supply Chain
  - Coming soon: Pharma, Mobile, Energy, IoT
- On-boarded 100+ new members (and many more coming)
- Enterprise blockchain projects proliferating everywhere!
Technical roadmap: key priorities

✓ **Privacy**: private contracts, zero knowledge / shared secrets

✓ **Permissioned networks**: pluggable consensus (no single point of failure)

✓ **Performance and scalability**: 1000’s of transactions per second, mills of transactions stored

✓ **Easiness to use**: easy set up, monitoring, recovery

… while maintaining compatibility with standard Ethereum and benefiting from its progress (ZK, sharding, PoS, etc.)
The Lyra Network in Spain

- Aim: to create a semi-private, enterprise-centric ethereum blockchain network among leading corporates and public institutions in Spain
- Led by a reduced set of initial members during launch, but open to everyone
- Permissioned ethereum network being deployed (Quorum and Parity testnets)
- Governance mechanisms under construction
- First priority is building a legally binding, digital identity mechanism for individuals and corporates
- Public notaries and lawyers associations leading from the beginning – as opposed to technicians

Launch members (May 30, 2017)
Conclusions

- Significant interest by corporates worldwide to use blockchain in private, enterprise-grade settings
- Technology increasingly ready for enterprise grade use, but not quite there yet
- Ethereum as the most advanced candidate, improving quickly supported by a huge community of developers, and fostered by hundreds of interested corporations
- EEA as a catalyst of all this, where leading corporates “co-opete” to accelerate readiness of Ethereum technology for production use, providing resources, requirements, guidance and governance
- Quorum as a first, reasonably viable alternative. Parity very close to enterprise grade
- Enterprises and public institutions starting to collaborate in real pilots everywhere. Spain’s Lyra network is a first