Blockchain / Distributed Ledger Technology
- DLT initiatives from an operations perspective -

ECB OMG Meeting 2019-09-04
André Kolb, Bernhard Brand | Commerzbank AG | Group Banking & Markets Operations
Distributed Ledger Technology / Blockchain
Blockchain / DLT Basics

**Principles**

- **Electronic Register** – Electronic Records
- **Shared Ledger - decentralized**
- Data / Transactions are documented in chronological order and distributed across multiple sites
- **No central entity**
  - No verification by trustee
  - Transparency and Availability (real-time) for participants

**Fundamentals**

- **Immutable Data => Finality**
- **Tokenizing of Assets**
- **Automated execution** of agreed conditions
  - Potential for cost savings, increased efficiency

**Blockchain Types**

- Public
- Private
- Unpermissioned
- Permissioned

**Characteristics**

- Decentralized Database
- Validation, Encryption (Hash)
- Consensus (Proof of Work, Proof of Stake)
- Smart Contracts

DLT offers high potential for reducing established intermediaries and existing business models => **Disruption**
Distributed Ledger Technology / Blockchain
DLT in Commerzbank Operations

Core Topics 2019 / 2020
• CASH ON LEDGER
• CAPITAL MARKETS
• TRADE FINANCE
• KYC / DIGITAL IDENTITY

Principles / Key Objectives
• Client-centric
• Create added value for our customers
• First mover

Commerzbank
DLT Lab

Commerzbank Operations
Group Banking & Markets Operations

Cooperation with DLT Lab
• Close collaboration since June 2016
• Support of selected DLT Use Cases / Pilots including New Product Processes (NPP)

Our Motivation
• Awareness of potential impacts on Operations (processes and services)
• Pro-active participation and support
• Enable future planning in Operations (resources, efforts, timelines, etc.)
• Learning organisation – Knowledge, Change, Transformation

Complementary
• Member of German Bankers Association (BdB) – Working Group DLT
• Member of EBF Blockchain Task Force
Distributed Ledger Technology / Blockchain
Main Incubator - DLT Lab at a glance

Facts & Figures

<table>
<thead>
<tr>
<th>2019</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path to production</td>
<td></td>
</tr>
<tr>
<td><strong>Path to production</strong></td>
<td><strong>Foundation, learning phase</strong></td>
</tr>
<tr>
<td>2016</td>
<td>2016</td>
</tr>
<tr>
<td><strong>Use Cases</strong></td>
<td><strong>&gt;80 analyzed</strong></td>
</tr>
<tr>
<td><strong>~10 regularly in scope</strong></td>
<td><strong>&gt;80 analyzed</strong></td>
</tr>
<tr>
<td><strong>&gt;50 Affiliates across segments/functions</strong></td>
<td><strong>r3 Investment in global tech consortium</strong></td>
</tr>
<tr>
<td><strong>2017</strong></td>
<td><strong>2018</strong></td>
</tr>
<tr>
<td><strong>4 POCs completed</strong></td>
<td><strong>Get real, ready and grow!</strong></td>
</tr>
<tr>
<td><strong>2 Co-Heads</strong></td>
<td><strong>8 Developers/business analysts</strong></td>
</tr>
<tr>
<td><strong>8</strong></td>
<td><strong>12</strong></td>
</tr>
</tbody>
</table>

The main incubator - a 100 % subsidiary of Commerzbank - supports the bank in its technological transformation via three routes:

- **Community building**
- **Ventures** – strategic investment in tech startups
- **Prototyping** – develop own prototypes on the basis of 12 technologies of the future e.g.

- Artificial Intelligence
- Blockchain / DLT
- Cloud
- Machine Learning
- Big Data
- Robotics
- Open API

Source Facts & Figures: Commerzbank DLT Lab | Frankfurt / August 2019

Distributed Ledger Technology / Blockchain
Commerzbank DLT Lab - Road Map

Road Map for DLT Lab

Maturity of Use Cases

|------------|----------------------|-----------------|---------------------|---------------|

Focus areas of Commerzbank’s DLT Lab in 2019

<table>
<thead>
<tr>
<th>Application area &amp; maturity</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAPITAL MARKETS</strong></td>
<td>Securities issuance and trading, (post-) trading processes, FX, syndicated loans</td>
</tr>
<tr>
<td>PoC</td>
<td>Pilot</td>
</tr>
<tr>
<td><strong>TRADE FINANCE</strong></td>
<td>Open account, bank payment obligations, digital letter of credit</td>
</tr>
<tr>
<td>PoC</td>
<td>Pilot</td>
</tr>
<tr>
<td><strong>PAYMENTS</strong></td>
<td>Plain payments and delivery vs. payment, e.g. by using e-money</td>
</tr>
<tr>
<td>PoC</td>
<td>Pilot</td>
</tr>
<tr>
<td><strong>KYC/ ID MANAGEMENT</strong></td>
<td>Self-sovereign digital ID management for private persons, corporate KYC</td>
</tr>
<tr>
<td>PoC</td>
<td>Pilot</td>
</tr>
</tbody>
</table>

Source: Commerzbank DLT Lab | Frankfurt / August 2019
Distributed Ledger Technology / Blockchain
Main Incubator - DLT Lab => Commerzbank Operations support

Current focus areas along value chain and beyond

Commerzbank Operations GS-BM

PUK

Compliance

Commerzbank Operations GS-BM

Trade Finance

FICC

Commerzbank Operations GS-BM

Corporate Finance

Treasury

Beyond Banking

Commerzbank Operations GS-BM

Others

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DLT Initiatives 2018 / 2019

DLT Lab / Group Digital Transformation & Strategy

- 8 Areas
- 18 Use Cases

Operations
Group Markets & Banking Operations (GS-BM)

- 4 Areas
- 10 Use Cases
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Source: Commerzbank DLT Lab | Frankfurt / August 2019
## Euro Commercial Paper

<table>
<thead>
<tr>
<th>Parties &amp; Roles</th>
<th>Issuer</th>
<th>Investor</th>
<th>Dealer</th>
<th>Platform</th>
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</thead>
<tbody>
<tr>
<td>SEP 2017</td>
<td>KFW</td>
<td>MEAG</td>
<td></td>
<td>main</td>
</tr>
<tr>
<td>DEC 2018</td>
<td>Natixis</td>
<td>Rabobank</td>
<td>ING</td>
<td>main</td>
</tr>
<tr>
<td>JAN 2019</td>
<td>Continental</td>
<td>Siemens</td>
<td>None</td>
<td>main</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Security</th>
<th>Payments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEP 2017</td>
<td>On Ledger simulated, ISIN: DE000A1V4HP3</td>
<td>traditional</td>
</tr>
<tr>
<td>DEC 2018</td>
<td>On Ledger UK law, ISIN: FR0125350217</td>
<td>traditional</td>
</tr>
</tbody>
</table>
| JAN 2019         | On Ledger LUX law, ISIN: XF0000C24384 | On Ledger (E-Money by)

Source: Commerzbank DLT Lab | Frankfurt / August 2019
Dec. 2018: Euro Commercial Paper on DLT

R3 and European banks complete euro commercial paper transaction

Written by Henry Vlah 6th December 2018

R3, the blockchain consortium, has partnered with Commerzbank, ING, Natixis and Rabobank, to produce a live commercial paper transaction on the Euro Debt Solution application, built on R3’s platform Corda.

This event follows the previous simulated transaction on an earlier version of the solution in September 2017.

“The issuance and settlement of securities is a complex process and current models are rife with inefficiency,” says David E. Rutter, CEO of R3. “Corda addresses these challenges by enabling parties to financial agreements to record them once and collaborate to maintain accurate, shared records of these agreements.”

With Natixis acting as the issuer, Rabobank acting as the investor and ING as both the dealer and escrow agent, the trade involved an issuance of €100,000 nominal, with a one-day maturity.

Commerzbank provided the pilot framework, software and distributed ledger network for the trade as well as guidance on regulatory implications.

Feb. 2019: Repo Transaction on DLT

Continental, Commerzbank and Siemens Successfully Field-Tested Blockchain Technology on Money Market

- Commercial paper transaction processed in minutes rather than days thanks to blockchain technology
- Project is a major step toward fully blockchain-based securities trading

Hanover, Frankfurt, Munich, February 21, 2019. For the first time, Continental, Commerzbank and Siemens have carried out a test transaction as part of a pilot project to process a money market security between the companies using blockchain technology. The transaction took place in January. It had a volume of €100,000 and a term of three days. Continental was the issuer of the money market security, which was in the form of a euro-denominated electronic commercial paper according to legal requirements stipulated in the Luxembourg law. Commerzbank provided the Corda-based blockchain platform through its research and development unit, Main Incubator, and acted as a service partner. Siemens subscribed to the money market security as an investor. Corporate law firm GSK Stockmann provided legal advice on the transaction.

Feb. 2019: EURO Commercial Paper on DLT

Commerzbank and Deutsche Börse execute legally binding securities settlement using distributed ledger technology

Proof of concept for the generation of digital cash and securities tokens / Completion of the first repo transaction based on delivery versus payment using distributed ledger technology

Commerzbank and Deutsche Börse have for the first time successfully used distributed ledger technology to execute a legally binding settlement of a repo transaction. The prototype transaction based on delivery versus payment was executed as part of a joint proof of concept examining the possible use of blockchain technology in securities settlement.
Selected DLT Initiatives 2019 with support from Operations Units

01/2019: **Euro Commercial Paper (ECP) – Pilot Trade**
Secs. Issuance (Lux. Law) – Distribution - Redemption of ECP
Partners: Siemens, Continental

03/2019: **Repo Pilot Trade** (Secondary Market)
Focus: Securities and Cash on ledger
Partner: Deutsche Börse / Eurex

Ongoing: **HQLA – Exchange for Collateral**
Exchange of **Digital Collateral Record** (tokenized Secs.)
for High Quality Liquid Assets (HQLA)
Partners: ING, CS, UBS, CIBC, Dt. Börse, Commerzbank

Ongoing: **Digital Custody Solution (DCS)**
Internet of Things (IoT) – Asset tokenizing,
**Asset deposits 24/7 for Corporate Clients**

**Credit Agency Services (Coba Lux.)**
Syndicated **Loan Administration via DLT**
Platform LenderComm (Finastra) – Tests planned

GS-BM driven initiative
Distributed Ledger Technology / Blockchain
DLT / Blockchain => Challenges - Opportunities

**Legal certainty – pre-requisites** (Commerzbank Operations view)
- **Clear Guidance for DLT based applications** – Level Playing Field – Sandbox Approach
- Modification of existing laws and regulations most likely (e.g. CSDR, SFTR)
- **Harmonisation of EU jurisdictions and in a global context => competitive aspects**
- Regulatory Reporting, Tax Aspects

**Technical Functional**
- DLT Scalability and Performance => **Standardization, Taxonomy**
- **Participants to agree on / determine a dedicated DLT Technology**
- **Interoperability**
- Dual Infrastructure => e.g. existing traditional securities vs. DLT based securities
  Securities Value Chain: Pre-Trade – Trade – Post Trade => gradual approach on DLT?

**Processes**
- Security Aspects – Access to privat keys
- Verification Services – e.g. specification of user rights (Read and Write)
- **High Data Quality**
  Blockchain / DLT requires **harmonisation of data and processes**

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Objectives
The Federal Government of Germany has set up a **Blockchain Strategy** to promote digital innovations and strengthen innovative technologies.

### Regulatory Developments

**Jan 2019**  
**BaFin** approval of Securities Token Offering in Germany for the first time  
Bitbond Bearer Bond: Issuance volume: 100 Mio. EUR, 10 years duration, FRN

**Feb 2019**  
**German Ministry of Finance (BMF):**  
Online Consultation DLT / Blockchain

**Mar 2019**  
**German Ministry of Finance (BMF):**  
Key note “electronic securities”  
Legal Framework for DE issuers, starting with debt instrument  
i.a. omission of physical documents (global certificates) foreseen

### Commerzbank DLT Lab

- Tailor made DLT Use Cases continued => Pilot Trades / Transactions
- Several Corporate Clients approach Commerzbank asking for DLT/Blockchain-based solutions (e.g. **Issuance of Securities**)

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How can we improve from an Operations perspective?

- Participation - collaboration - visibility
  Operations Process Expertise, Know-how

- Increase awareness of Employees for Digitization topics and potential changes

- Gateway to Digital Technologies - Commerzbank 4.0

- Touch Points with DLT Lab and leading CBK Units

- Lessons learned

- Cultural Change => Mind Set

Supporting Initiatives
e.g. via BdB Working Group DLT

Benefits

DLT / Blockchain

Business Cases => Client Centric

Use Cases / Proof of Concepts

Productive Environment

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Stay connected – Engagement Group Banking & Markets Operations

**Activities**

- **Monitor DLT Initiatives** and developments
- Analyse potential areas of application
- Provide **DLT Updates for Senior Mgmt.**
- Continue DLT Community Meetings
- **DLT Information Sessions** - Operations

**External**
- DLT Events: e.g. “Between the Towers”

**Internal**
- DLT Lab Affiliates Calls
- **Digital Working Group** (cross-segments)
- **Networking** - DLT Contacts
- Alignment with other Digitization Topics

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Staff Members Operations (GS-BM)

Talents

DLT Community GS-BM
Thank you – Any questions?

Bernhard Brand
Key Area Trading
Cluster Post Trading
- Market Advocacy -

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