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New Technologies in Asset Management and Custody

BVI Fund Operations Konferenz, 2 April 2019
Praxisforum Depotbanken

Dr. Martin Schulte, LLM

Agenda

- Artificial Intelligence and Robotics – some basics
- The future of custody – not just custody: How DLT and AI will impact custody business models
- Crypto funds, crypto custody – where we stand today and what might come

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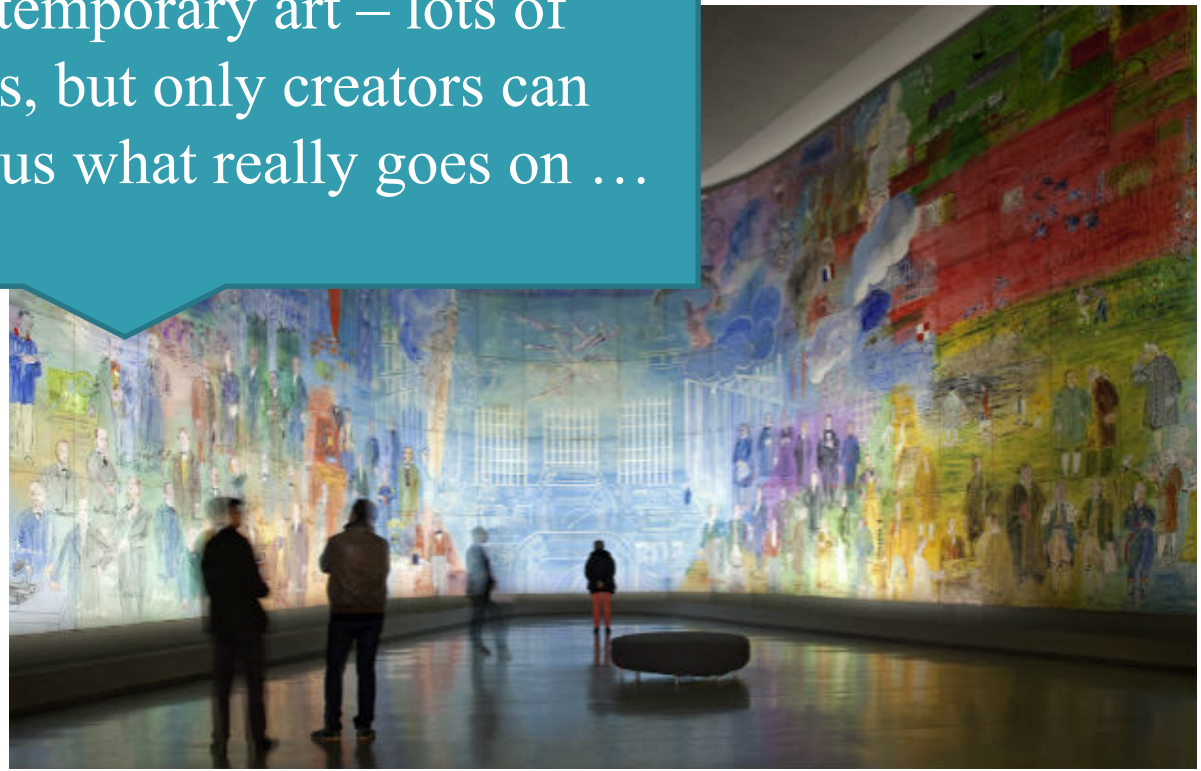
Artificial intelligence is like contemporary art – lots of talks, but only creators can tell us what really goes on …



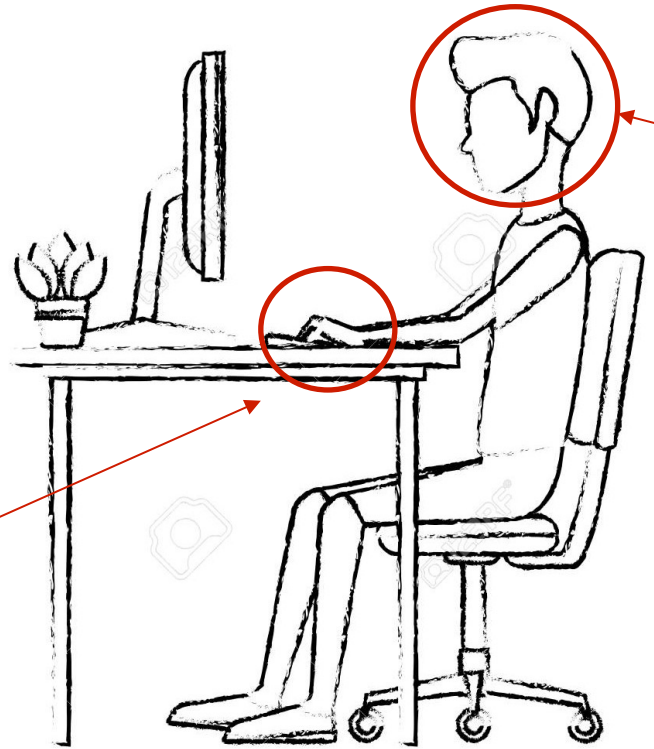
Can AI replace us?

"We're looking for someone with your exact qualifications, but a mechanical version."

Yes. For better and for worse

Robotic Process Automation (RPA)

Repetitive manual work without thinking ata



Cognitive processing of tons of unsorted data

- What info is relevant?
- Where it can be applied?
- What is the logic behind particular data?

(e.g. extracting right data, determining logic behind it)

Artificial Intelligence (AI)

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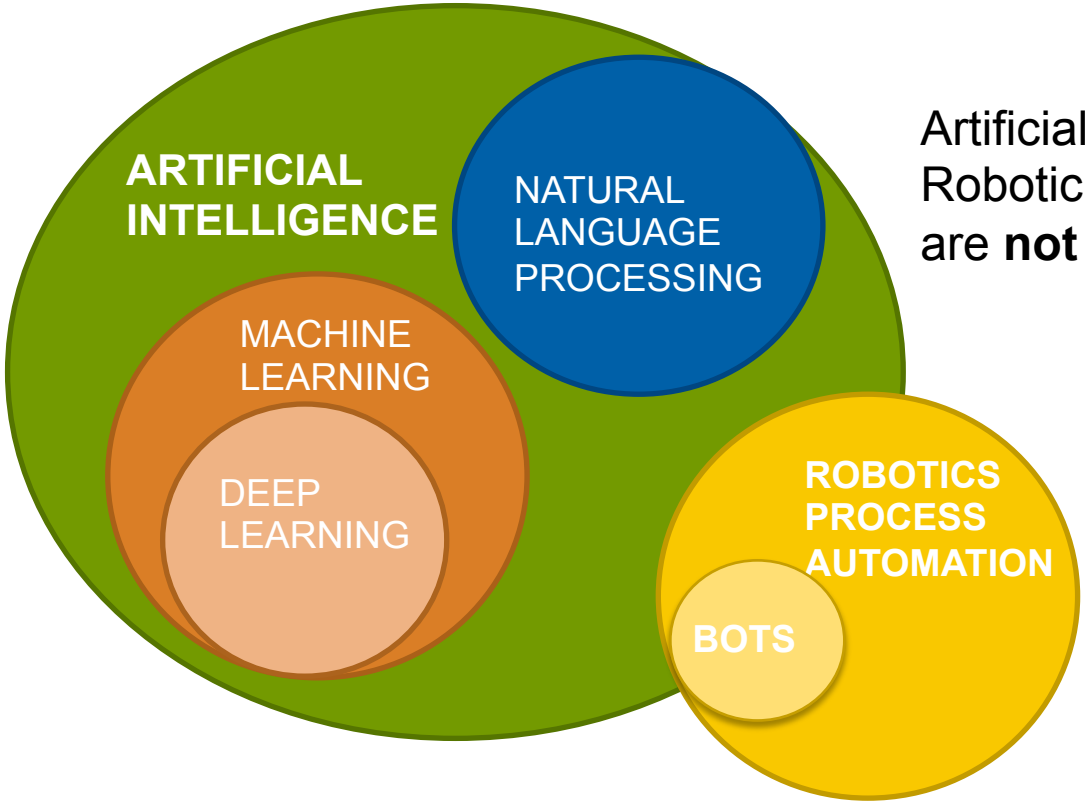
Artificial Intelligence & Robotic Process Automation



Artificial intelligence (AI) and Robotic Process Automation (RPA) are **not the same**

- **AI** - simulation of human intelligence by machines
- **RPA** - software robot that mimics human actions

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Types of AI and RPA

Machine Learning

Subset of AI: Programs with algorithms fed with structured data which **modify themselves** without human intervention to produce desired results

Deep learning

Programs similar to those in machine learning but operating with **different layers of algorithms** where each provides **different interpretation of data** it feeds on

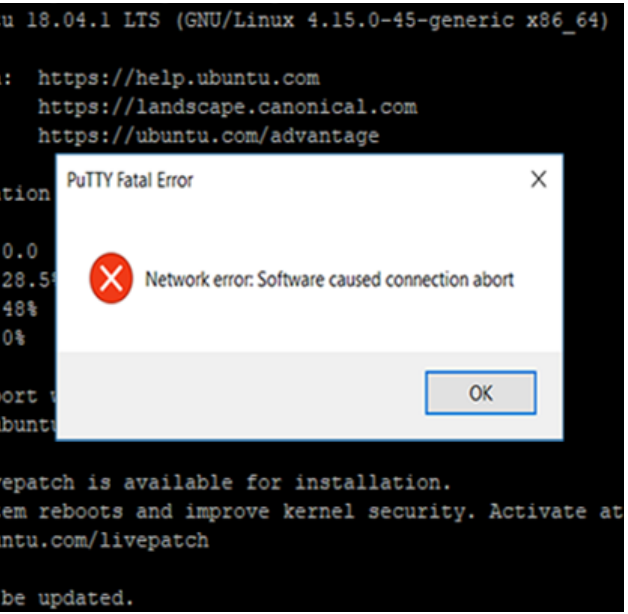
Bots

Software application that runs **automated tasks** over the **Internet**

Natural Language Processing (NLP)

Subset of AI enabling computers to understand and process **human languages** to get computers closer to a human-level understanding of language

How AI operates

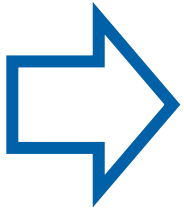


- **Stat-based** – operates on a statistical or probabilistic process, forming knowledge from training that finds patterns in data **with or without support of a human**
- **Rule-based** – operates on rules, fed by a subject matter expert. Problem – adjusting the precedence between numerous rules – **human interaction**

What can be done

Technical options

- Greater automation of processes
- Process **high-volume**, repetitive activity with low margins
- Cope with **Big Data**
- Ongoing **regulatory compliance** (MiFID2 – requirement to capture and analyse significant amounts of data in order to monitor for market abuse, and provide key insights for best execution, among others)
- **Deep research** of documents
- **Minimizing human** interaction



Business achievement

- Focus on **value-added tasks**
- Lower costs
- Possibility to get best insights for clients
- Possibility of providing the customer with «**global experience**»
- Increased efficiency
- Possibility of fraud is near to 0%

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Risks and Concerns

Opacity of certain AI technologies

- Deep learning do not reveal rationale of conclusions made
- US - requirement that banks should be able to validate and assess the decision-making of their analytics tools
- Aim - consumer protection

AI will trigger vast changes in bank workforces

- Automation of jobs
- Citi - automation could cut 10,000 jobs by 2023
- Opportunities for employees ready to work with AI

Provision of «average solutions»

- Machine learning is based on a statistic approach, which automates average behavior (e.g.regulatory compliance)
- System is not able to exceed programming

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AI and Robotics are tested…

- PROXY VOTING
- TRANSFER AGENCY UNITS
- CLIENT REPORTING
- FUND ADMINISTRATION
- BIG DATA
- CYBER SECURITY

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Future of Custody

Similarity of custodian services maintains **relatively low competition** compared to other banking sub-sectors

Processing

Custody is widely recognized as **commoditized service with limited scope of innovation** (no competitive advantage in processing a settlement or corporate action)

Commoditized and low margin – not limited to custodians (specialist providers or industry utilities) – new companies have entered post-trade arena – traditional custody will be surpassed by technology

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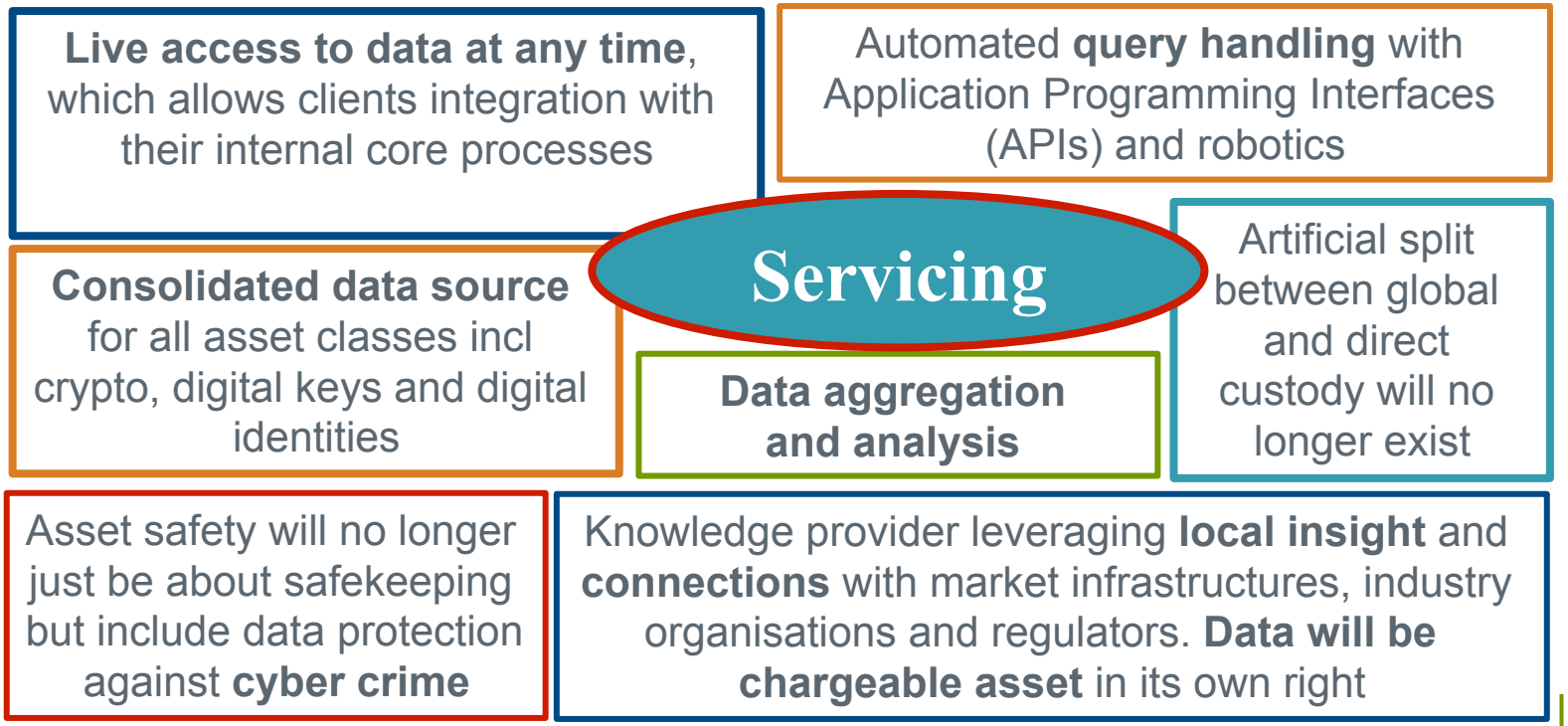
Future of Custody : not-just-custody



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Future of Custody : Fund Distribution

Retail clients will increasingly invest online. **Robo-advice** will help clients to **select investments** that fit their risk appetite. For custodians this will be just **another source of information**, received via Application Programming Interfaces (API)

Future fund distribution requires

- Ability to provide market intelligence
- Tax and regulatory watch and hotline support
- Booking fund unit in client account (questionable whether CSDs and TAs will continue to exist, at least in current setup)
- Risk metrics (e.g. Solvency II look-through)
- Regulatory reporting (e.g. AIFM reporting)

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Future of Custody : Client Services

AI and DLT supports real time information sharing, allowing quick response times for client queries

Request about settlement in another market in another time zone can take several days involving several parties

Digital workflow tools combined with robotics and self-learning technology (AI) will allow most of these requests to be handled instantly

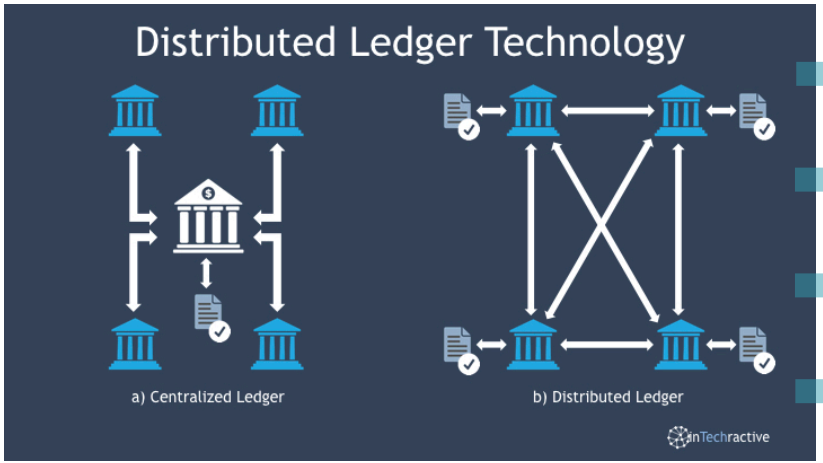
Globally consistent experience

Clients face diverse service models in different local market infrastructures, legislation, regulation and practice

Custodians will be expected to ‘normalize’ local differences and provide truly consistent experience

DLT as Disrupter / Game Changer

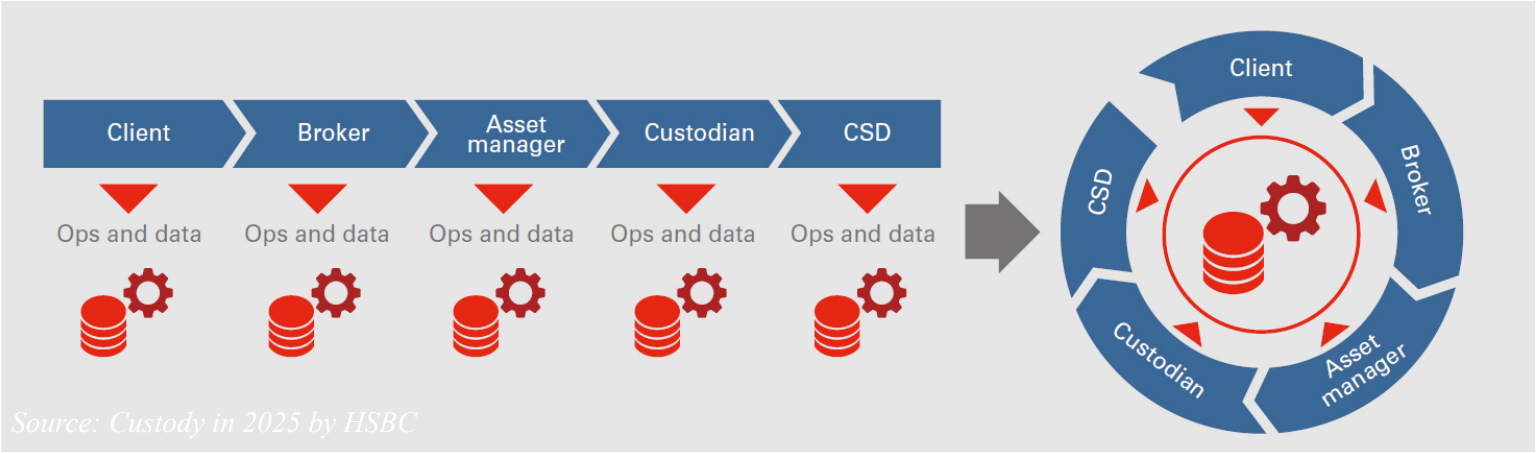
DLT may disrupt financial infrastructures that are built around a central entity that guarantees their functioning



- Central banks
- CCPs
- CSDs
- Custodians

Source: inTechractive

Single Book of Records – DLT



- Each market participant has its own ops and data
- Data is duplicated and processed by each party
- Limited sharing of operational capacity and data

- A central utility is created for processing and storage of data
- Each party enhances same data as transaction passes through value chain
- No value gained from operational processing – value gained from services

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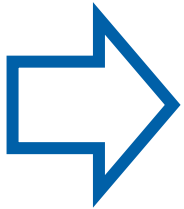
DLT – One Version of Truth

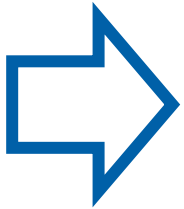
'One version of truth' about securities master data, holdings, entitlements, standard settlement instructions and other data will work across entire value chain. Brokers, custodians, CSDs and clients will have access to single book of records in real-time

Benefits

- Shorter settlement cycles
- Cost reduction
- Full Straight-Through Processing (STP)
- Removal of reconciliation processes
- Fewer settlement failures
- Entire matching process can take place within this closed community, turning settlements into an internal book transfer. Shortening of settlement cycle to T+1 or even T+0



Impact on risk profile and liquidity requirements of custody business



Exchanges, CSDs and brokers still largely operate separate platforms for different asset classes, often based on single currencies - functions will be absorbed by other parties in value chain

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Tokenisation of financial and real assets

REAL ASSETS

REAL ESTATE

DIAMONDS

CARS

DERIVATIVES

FUND SHARES

STOCKS

FINANCIAL ASSETS

DLT

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Crypto Derivatives

Examples

- Works similar to other instruments of such kind
- Usually do not require to buy the underlying asset
- Leveraged products like CfDs proliferate the already high volatility of crypto-currencies indicating high margin requirements
- Leverage is offered by majority of brokers while most cryptocurrency exchanges – with some exceptions – do not support this option
- Infrastructure for derivatives could be largely facilitated through DLT - smart contracts provide for the automated execution of payment and delivery obligations potentially arising under swaps, options or forwards

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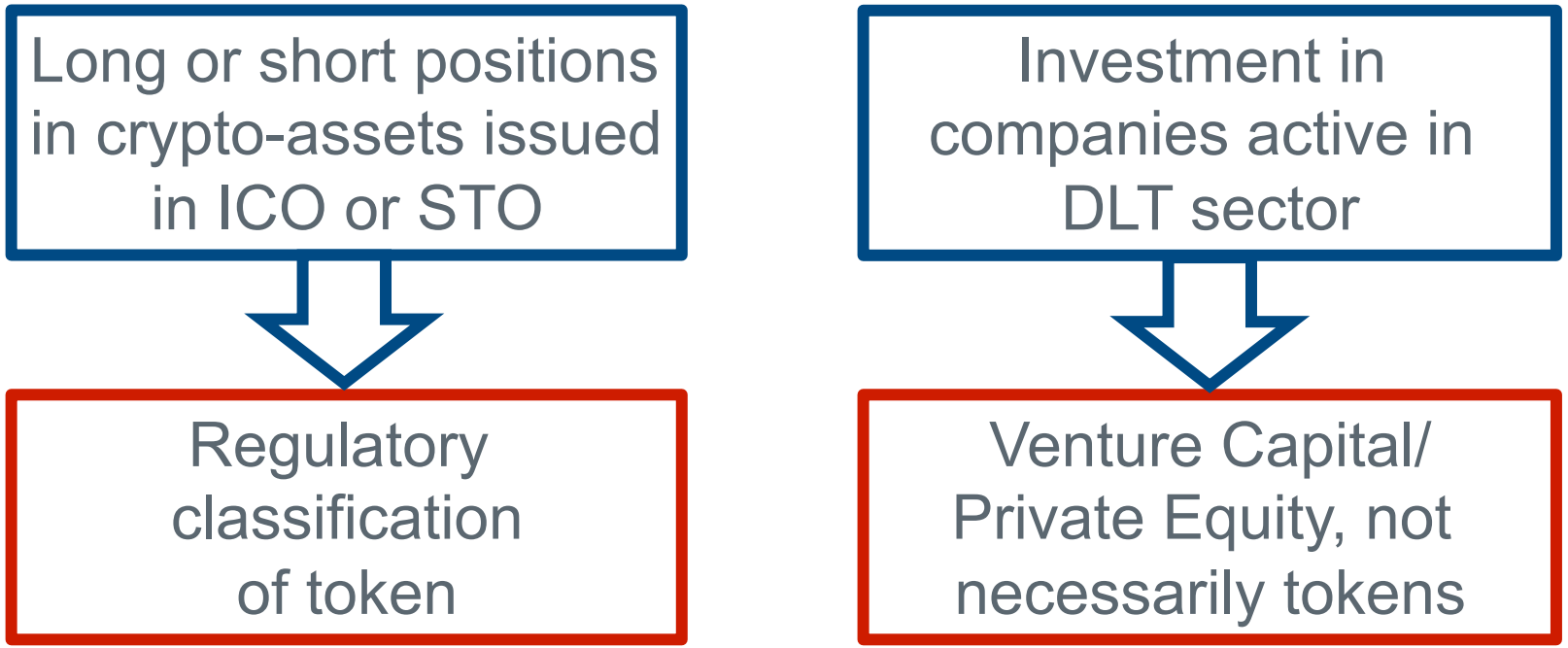
Crypto Funds



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Crypto funds: 2 examples

POLYCHAIN CAPITAL

Polychain Capital (2016)
active management strategies, digital currencies, not companies
AuM $1.04bn

Hedge fund (USA)

POSTERA BANK FRICK

Postera fund Crypto I (2018)
Crypto assets with high market capitalisation (>51%)

AIF (Liechtenstein)

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Distribution of Crypto Funds

UCITS **Hedge funds**

Many but not all crypto assets are volatile and opaque – retail or funds of funds may enter market when EU regulation is established

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Token Portfolio Management

What matters?

- Is **DLT necessary** or could benefits be equally (or better) achieved with conventional technologies?
- Sufficient **proof of expertise** and **integrity** of the management/issuer?
- Does **management/issuer** assume **liability** under civil law for misinformation?
- Business model **sustainable** and **scalable**?
- Risks and safeguards for **cyber-attacks**?

- Legal and **regulatory** environment?
- Compliance with **AML/KYC** rules?
- Is technology **patentable** and, if so, have all relevant patents been obtained?
- **License**/risk that license expires?
- In case of open source software-based DLT systems (Ethereum or R3 Corda) must program code of application as the basis of the **business model be disclosed** and if so, does this jeopardize success of business?

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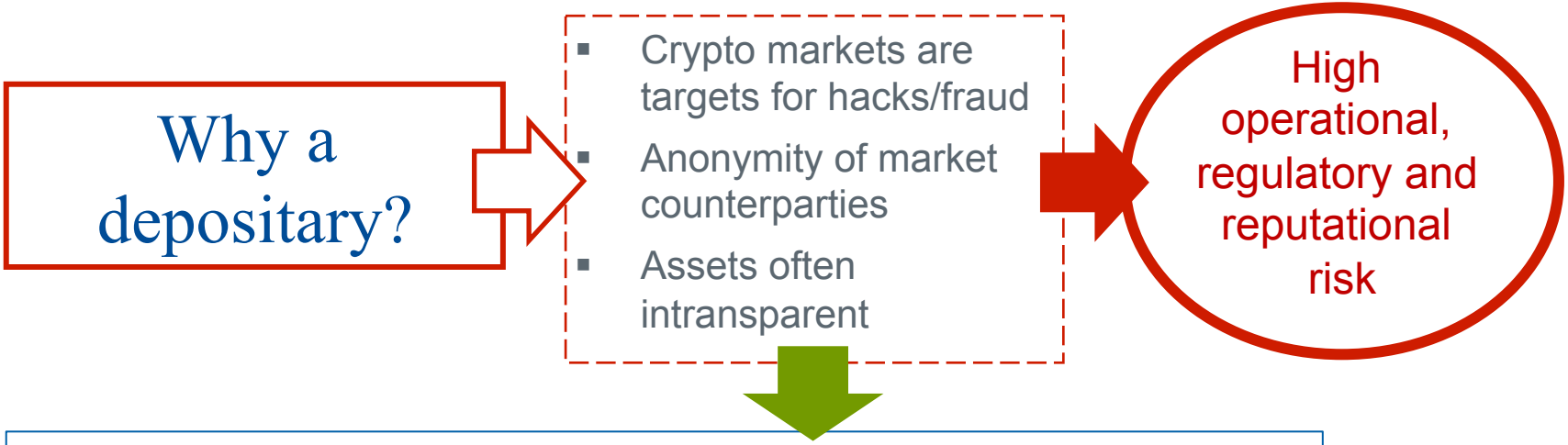
Crypto Custody



Clients look for established custodians to secure assets

- existing relationship
- comfort through backing of significant institution with strong governance and control framework and sizeable balance sheet

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Crypto Custody Solutions

To mitigate liability risks, depositaries must clearly identify scope of obligations incl criteria of token to be held in fund and potentially in custody

Clear and legally effective contractual rules in service level agreement between AIFM and depositary

Points to consider in SLA

- Qualification of token
- Processes: Storage of private key
- Delegation of custody
- Investor expectations
- Anti-Fraud Processes
- Liability
- Pricing

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Safe Custody in DLT Environments

Financial instruments that can be held in custody

Other assets

Crypto custody = safe custody or ownership verification under AIFMD?

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Crypto Custody: eWallets

Ownership verification for crypto-assets → access to eWallets that every node keeps on its device

Like ATM as it shows **current balance** of account when accessed. When unlocked, eWallet scans ledger for transactions that proprietor made - If Blockchain contained more info – as in a smart contract – it would also be shown

private key = eWallet address (comparable to account number) communicated to transaction partner

public key PIN of account, required for initialising transaction, contains personal information identifying node and used to unlock public key

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Crypto Custody : Hot & Cold Storage

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Token stored

offline (cold storage)

online (hot storage)

Crypto custody requires that depositary is able to provide protection against

(1) external attacks

(2) human error

(3) misuse due to internal possibilities of access

Valuation of Crypto Assets

AIF must have valuation policies and procedures which clarify methodologies

Methods for stocks / derivatives not necessarily suitable unless token qualifies as financial instrument

Crypto community has made significant progress – methods are adjusted to specific nature of token to get realistic result

Relative methods

Metrics to compare historic and current value of crypto asset eg "Network Value-to-Transaction (NVT) Ratio“ is calculated by **dividing network value based on market capitalisation by daily volume transmitted** through blockchain, measured in suitable legal currency

Absolute methods

Aim to find **intrinsic** value. Key assumption is that some crypto assets today will fulfil hybrid of medium-of-exchange and store-of-value functions of legal tender. To quantify these functions, methods look **at supply, transaction and storage demand** of token in its specific use case

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Contact and vita

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Martin advises financial institutions in regulatory law, building on more than 13 years spent within a banking and investment funds association, the European Central Bank (ECB) and international law firms. Starting out in private practice, with a focus on real estate and securitizations, he represented foreign banks and assets managers in legislative procedures and vis-à-vis supervisory authorities on securities, investment funds, AML and derivatives regulation as well as in tax compliance (FATCA). As head of the capital markets desk he chaired the association's working groups Depositaries/Global Custodians, Prospectus Law and Securities/Stock Exchange. Prior to joining Jones Day, Martin spent 4 years in the Supervisory Law Division of the ECB, focusing on capital and resolution requirements (own funds, liquidity, governance, MREL/TLAC) under the Single Supervisory Mechanism (SSM). Martin teaches financial regulation as visiting professor at the European Business School in Wiesbaden, at Queen Mary College in London and at the Academy of European Law in Trier.

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