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Deloitte EMEA Blockchain Lab

Hungarian National Bank

April 20th, 2018

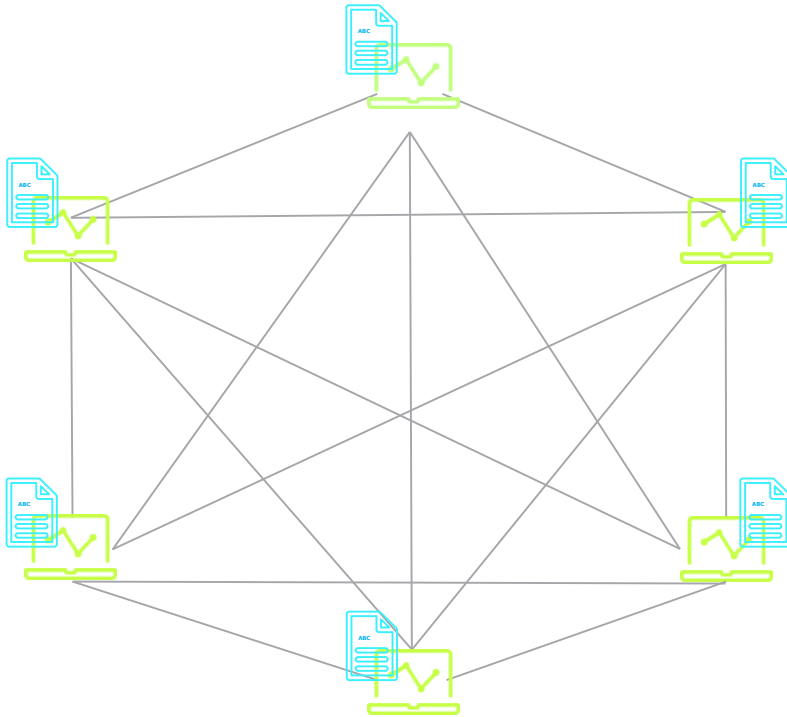
Agenda.



- 1** Blockchain Basics
- 2** Use Case Examples – Financial Services
- 3** Regulatory Overview

What is blockchain?

A decentralized, distributed ledger that provides a way for information to be recorded, shared and maintained by a community.



A **network of computers**, connected via the Internet, in which users at any one computer can receive or send peer to peer:

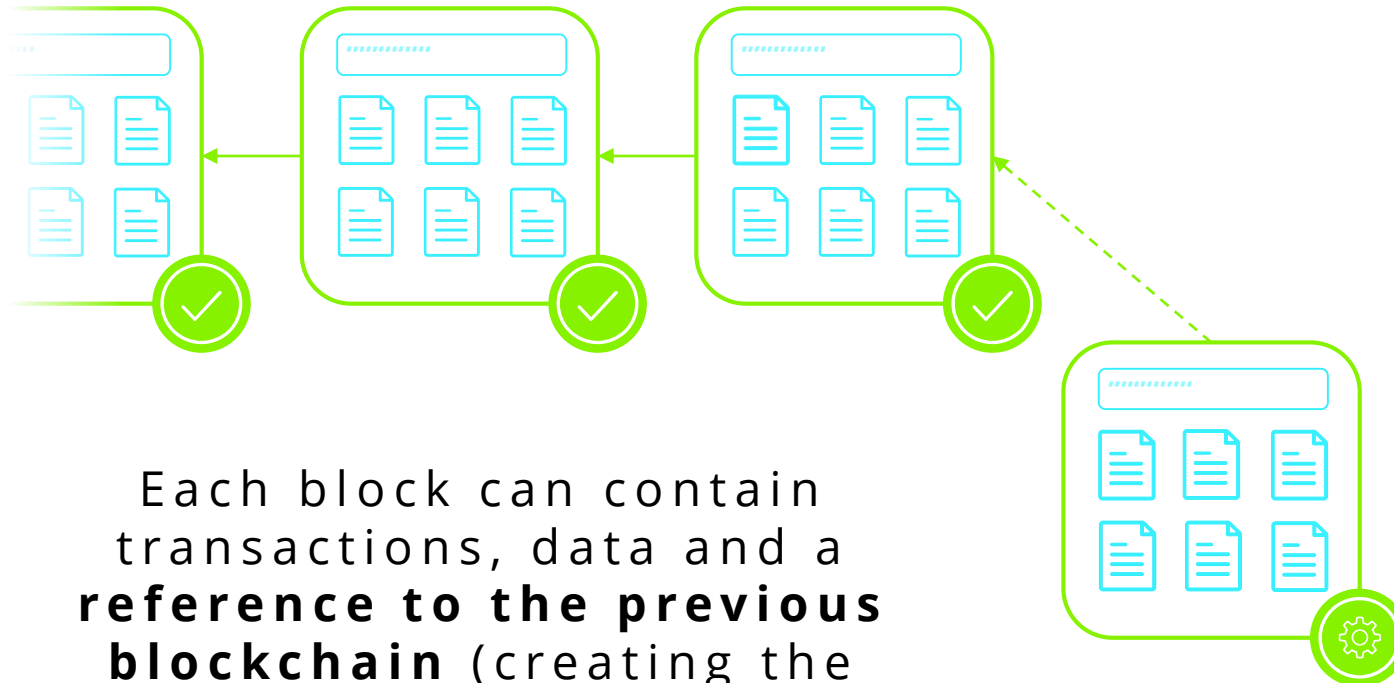
 **Value**

 **Identity**

 **Data**

Block + block + block = blockchain.

A blockchain is a series of interconnected blocks, with new blocks added on the end of the ever lengthening chain.



Each block can contain transactions, data and a **reference to the previous blockchain** (creating the chain)

Transactions recorded **chronologically** and **cannot be changed** once added to the chain

For **blocks to be added** to the blockchain, it must be achieved through **Consensus**

Blockchain and its characteristics.

Blockchain technology has particular characteristics that sets it apart from other technologies.



**Value
Transfer**



Immutability



Auditability



**Data
Storage**



Consensus



**Smart
Contracts**
(Distributed
Workflow)

Blockchain consensus mechanisms.

THE FINALITY OF EACH NEW BLOCK IS AGREED VIA A SHARED CONSENSUS MECHANISM

PROOF OF WORK

**Bitcoin
Ethereum**

Perform a mathematical algorithm that is difficult to do, but easy to verify if correct

PROOF OF STAKE

Ethereum - 2018

Staking a token(s) to perform correct mining in return for rewards from the network. If you forge a transaction, your tokens are taken away as a penalty

PROOF OF AUTHORITY

**Ethereum -
Private Only**

Round-robin validation of blocks by authorised validators/nodes

PRACTICAL BYZANTINE FAULT TOLERANCE

Hyperledger

67% of the authorised validators/nodes must agree on the validity of a block



Technology Landscape

Technical breath in Blockchain Technology.

Ethereum

Deloitte EMEA Blockchain Lab have built **6 blockchain projects** on the Ethereum platform.

- A **reconciliation and payments** system
- DNV GL - **certification** platform
- Bank of Ireland - **MCC Regulatory reporting**
- A patients **medical data sharing** platform
- **Commodity Trading** platform which focuses on trading deal flows
- Irish Funds – **MMIF Regulatory reporting**

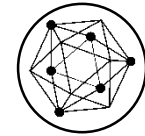


Deloitte EMEA Blockchain Lab joined the **Ethereum Enterprise Alliance**

Additional Blockchain Platforms



Bitcoin is a consensus network that enables a new payment system and digital money. It is the first decentralized peer-to-peer payment network that is powered by its users with no central authority or middlemen.



Hyperledger is a permissioned, shared ledger that is being developed in an open-source environment. Fabric is the most developed implementation, managed by several companies, most notably: IBM.



MultiChain helps organizations build applications on blockchains and shared ledgers though managed permissions, rapid deployment, and data stream. MultiChain is developer friendly, customizable, and bitcoin compatible.



R3 consortium's joint efforts have create an open-source distributed ledger platform called Corda, especially geared towards the financial sector.

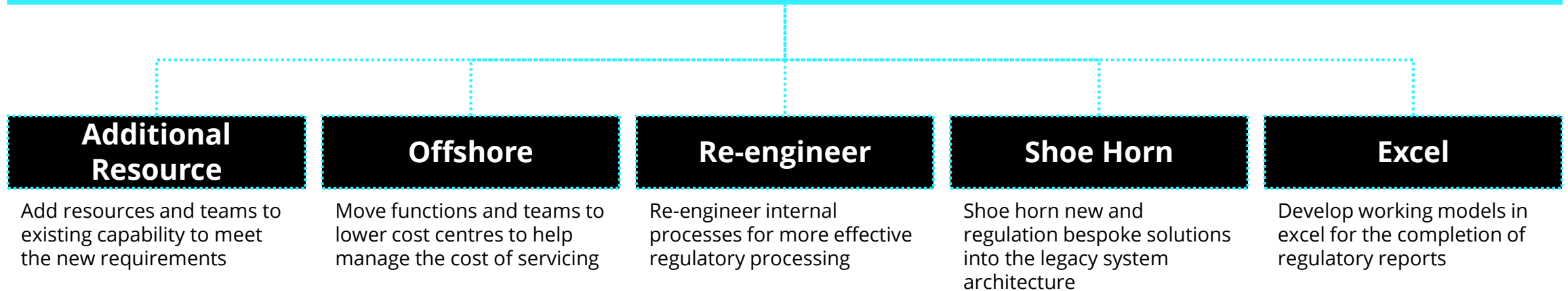


**Blockchain in
Action**

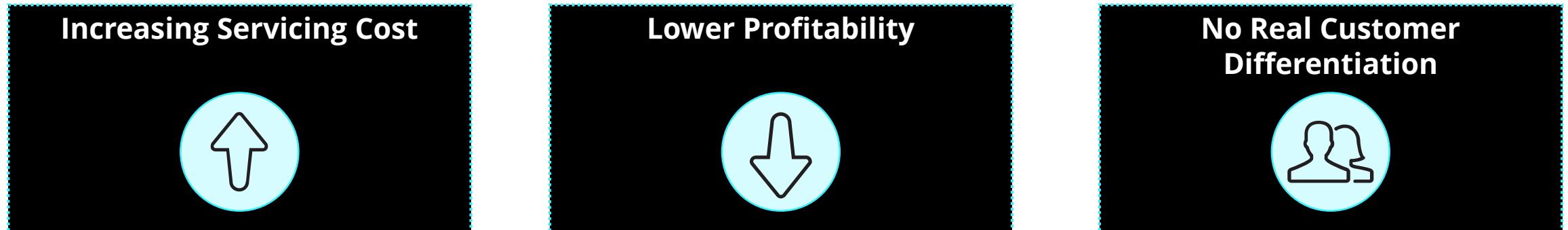
Regchain – Regulation reporting.

Since the GFC Regulators, across the globe, have acted to increase financial stability whilst protecting the investor. This has resulted in an increasing regulatory burden which is impacting the bottom line.

Increasing Regulatory Requirements – A Varied Industry Response



Result



Regchain – MMIF: A Case in Point

MMIF is the primary control for Irish Domiciled Funds into the Central Bank of Ireland. It is reported on a quarterly basis and populated via Microsoft Excel.

As-Is Process

Process

Transfer Agent



Data Extraction



Maker Review



Control Checks



Beta Checkers



Submit via ONR

Domestic Regulator



Banc Ceannais na hÉireann
Central Bank of Ireland
Eurosistem

Regional Regulator



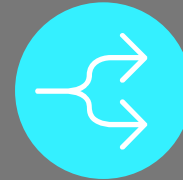
Challenges



Manual Processing



Data Integrity



Regulatory Changes



Cost

Cost

400

x

90

=

600

÷

43.5

=

14

x

60K

=

€840
K

Total Irish Domiciled Funds

Average time (in minutes) taken to complete process

Total hours spent completing MMIF reports per Quarter

Total hours available to complete MMIF reports

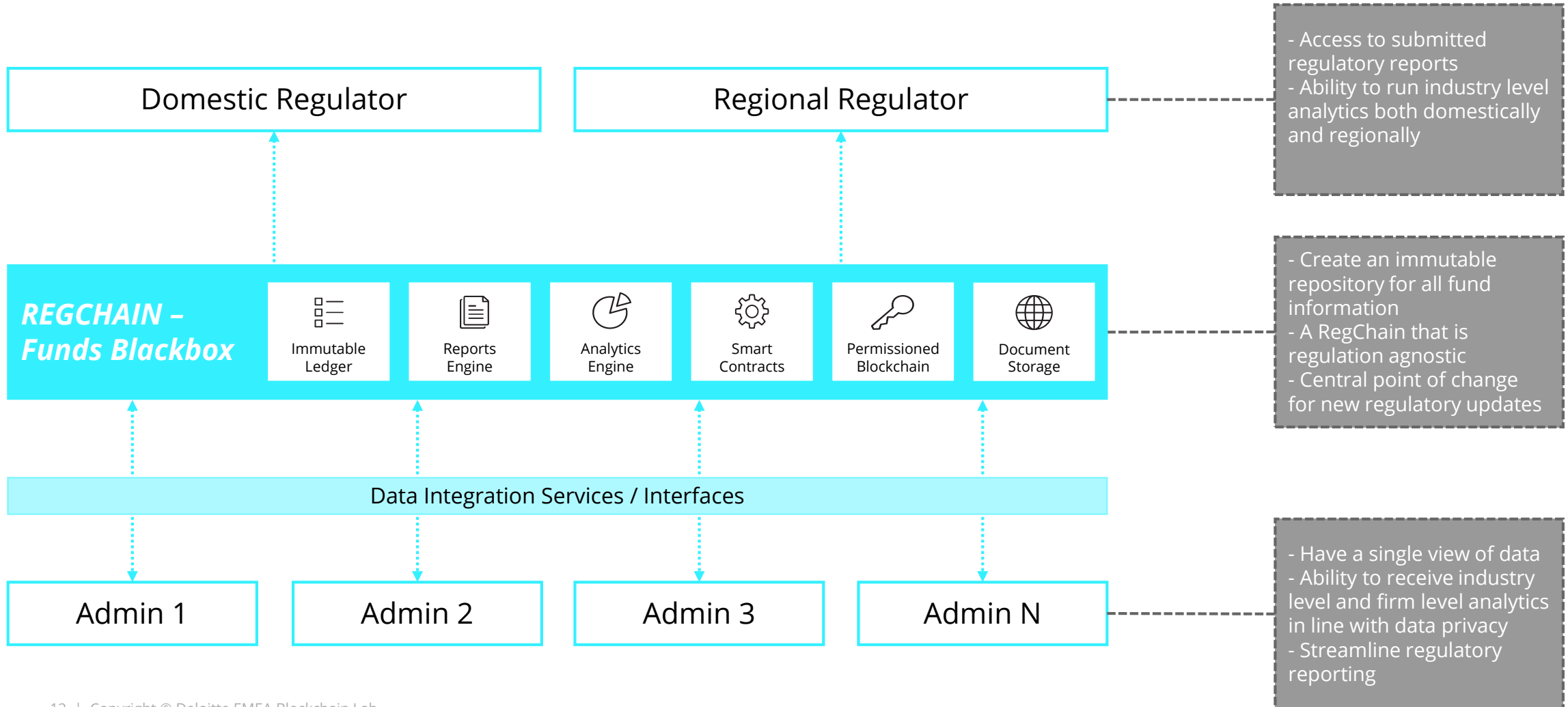
Number of resources required for MMIF/qtr

Number of resources required

Annual cost for non-revenue generating MMIF report**

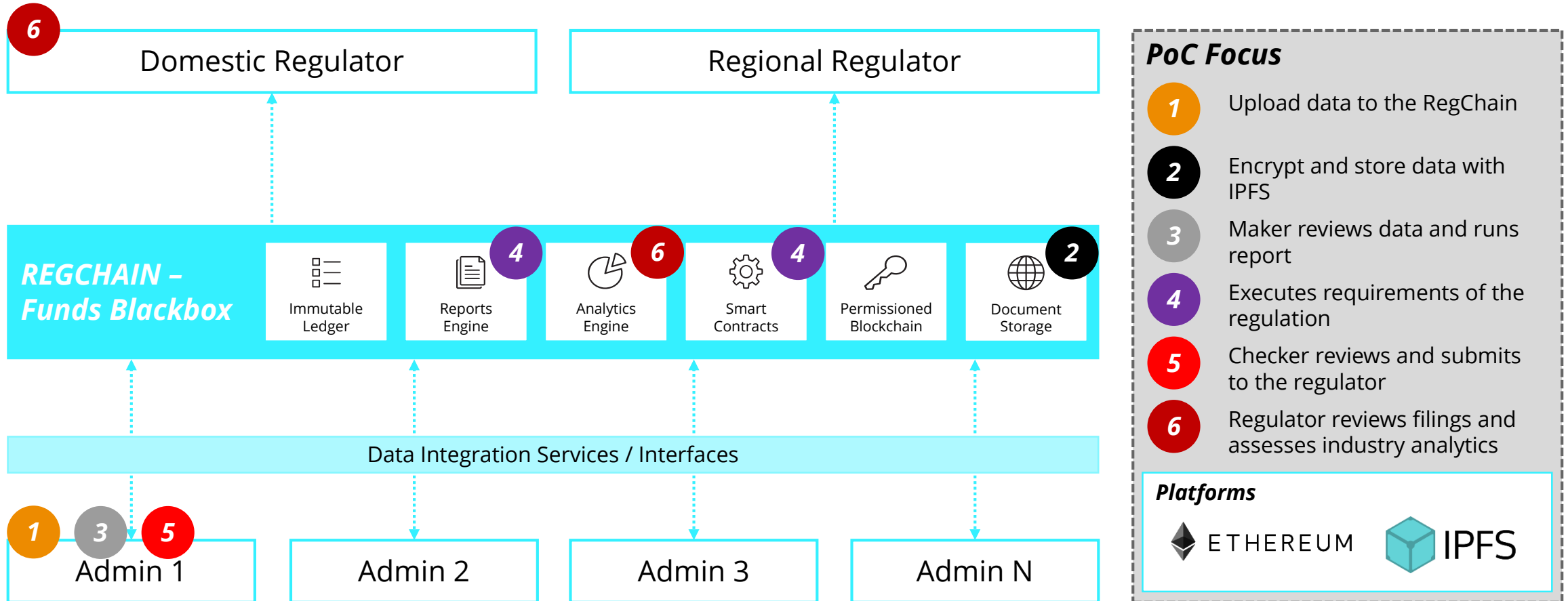
Regchain – Our Vision

Our vision is operational efficient regulatory reporting, providing insightful analytics whilst increasing transparency, auditability and overall industry safety.



Regchain – Our Proof of Concept Focus

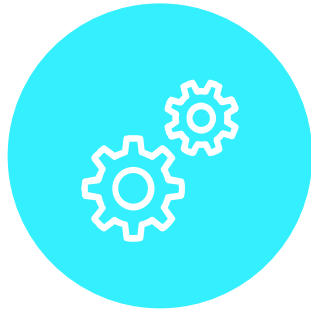
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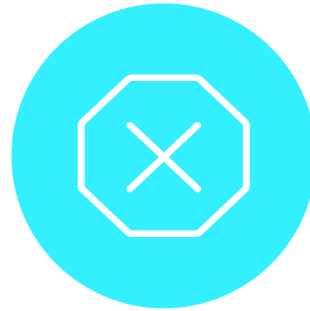
Regchain – The Benefits

Streamlining compliance with ancillary benefits for industry.

The Benefits



Process Efficiency



Security



Analytics

To hack the proposed technical structure of RegChain you must:



IPFS

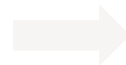
Access
IPFS



Decrypt the
file



Modify the
file



Encrypt the
file



Access to
RegChain



Modify
Smart Contract



Network accept
modification



Thank you.

Antonio Senatore

Chief Technical Officer, EMEA Blockchain Lab

Contact: Asenatore@deloitte.ie

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