

ACT Blockchain Panel

June 2018

How did we get here?

We are witnessing the rise of a **new era of disruptive innovation**, highlighted by the convergence of **digital** and **biotech** revolutions¹ ...

...and the emergence of **new business models** and **wealth creation** for non-traditional players



With you today...

*“We must be willing to let go of the life
we have planned, so as to have the life
that is waiting for us”*

– Joseph Campbell



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Grainne specializes in **digital transformation**, helping companies transform by leveraging **emerging technology** and agile delivery methods. Prior to PwC, she spent 20 years implementing technology, business, and regulatory change programs during her tenure at Goldman Sachs and Morgan Stanley.

Grainne is the U.S. leader for PwC’s **Blockchain** efforts. In this role, she works with cutting edge **startups** and **large technology companies** to harness the power of the Blockchain eco-system for her clients.

Grainne is passionate about efforts to **transform the lives of women and girls** and sits on the Board of the New York Women’s Foundation. She is an active fundraiser and advocate of **diversity and inclusion**. She launched a campaign to encourage broader participation in philanthropy which she believes builds more authentic and well-rounded leaders. She has three young children and lives in Brooklyn, New York.



Innovation is
essential to harness
the full potential of
today's new Era

Digital

Since the dawn of the internet, technology innovations are continuing to accelerate our progress in the information age

Data

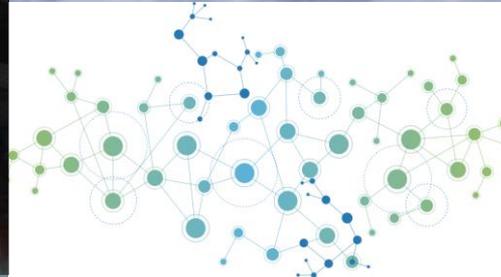
Affluence of data is creating opportunities and insights, as well as challenges and threats

Disruption

Disruptive innovations are impacting the way we live, work, and interact with each other

Decentralized

The rise of new decentralized business models highlights a desire to shift economic and societal balance of power

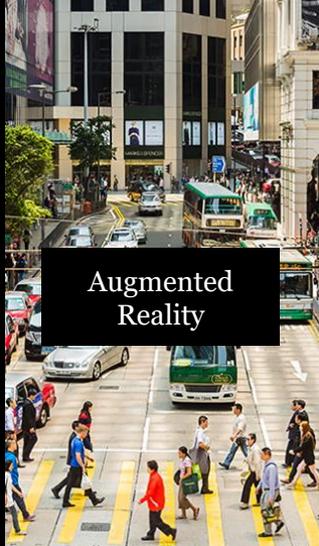


Proliferation of emerging technologies is expansive and complex



Blockchain is just one of the **'essential eight' technologies** to consider when to drive innovation

Dive deeper with [The Essential Eight Technologies Board byte: blockchain](#)



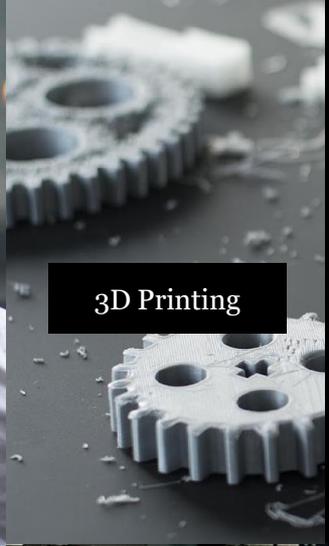
Augmented Reality



Drones



Virtual Reality

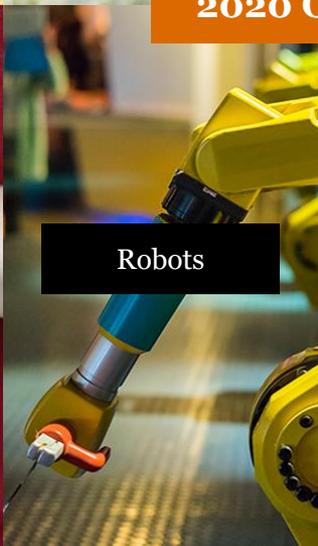


3D Printing

2020 Outlook



IoT



Robots



Blockchain



Artificial Intelligence



What is Blockchain?



What is **bitcoin?**

An unregulated **digital** virtual **currency** based on **blockchain** technology. It is used to process P2P transactions and offers **lower transaction fees** than traditional online payment mechanisms



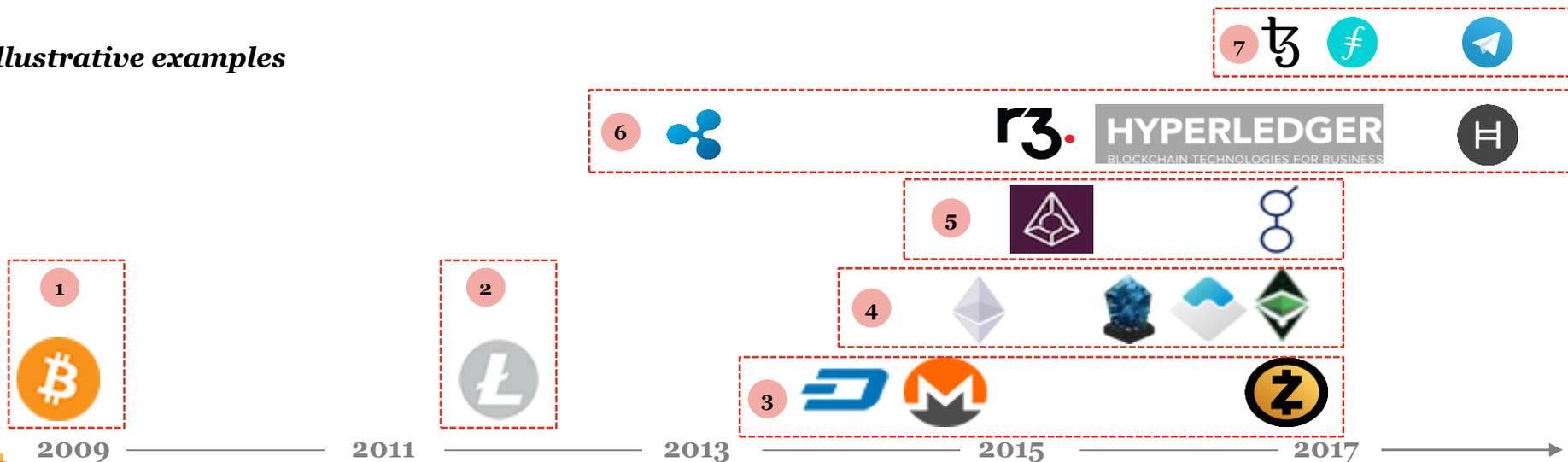
What is **blockchain?**

A decentralised **public ledger** of all transactions, essentially blocks of validated and **cryptographic** transactions chained together by mathematical **algorithms**

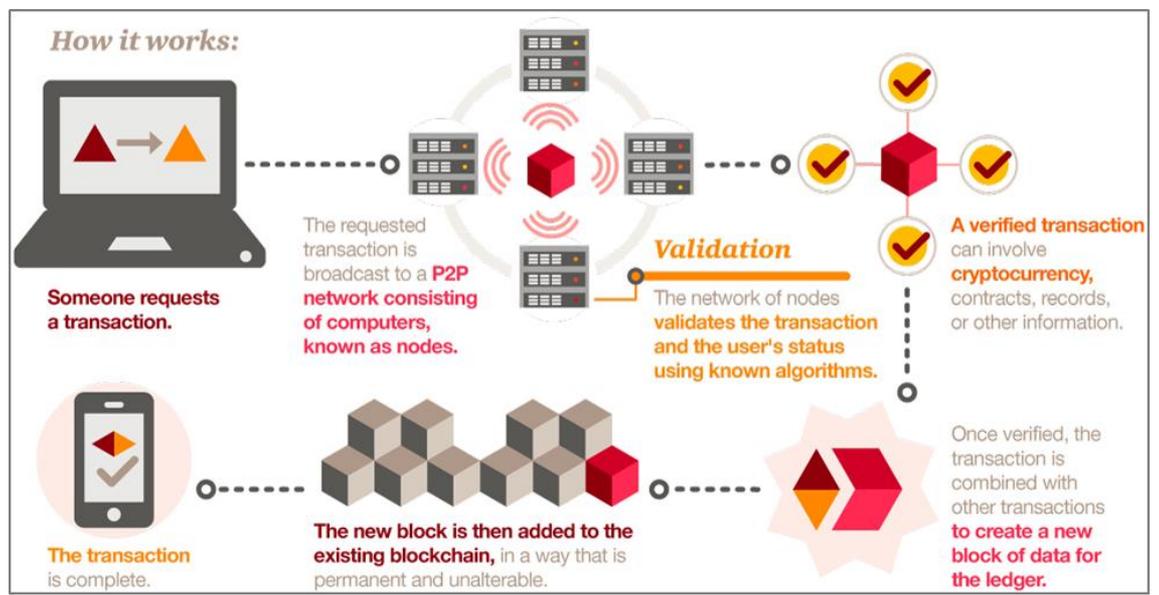
The Blockchain ecosystem has evolved substantially since the inception of Bitcoin back in 2009



Illustrative examples



Here's how blockchain works...



...and the key technical concepts that come together to make it work and different from existing solutions



Distributed ledger

Every participant in the network has simultaneous access to a view of the information



Cryptography

Integrity and security of the information on the blockchain are ensured with cryptographic functions



Consensus

Verification is achieved by participants confirming changes with one another, replacing the need for a third party to authorise transactions



Smart contracts

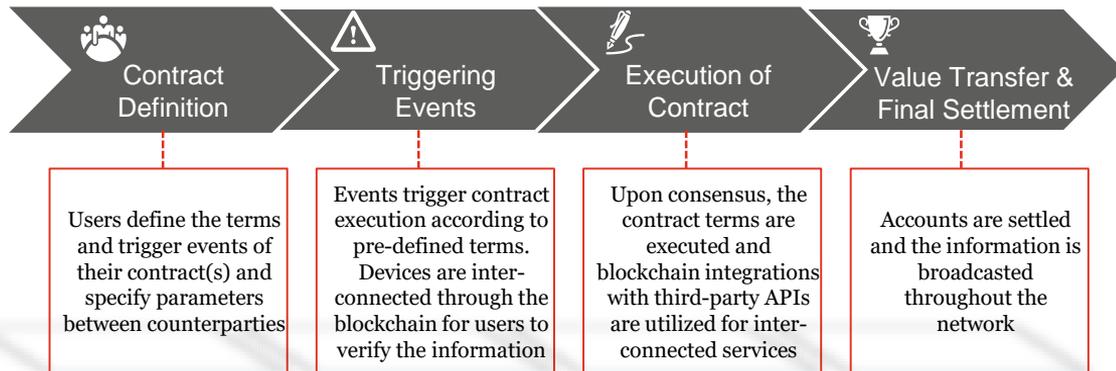
The ability to run additional business logic means that agreement on the expected behaviour of financial instruments can be embedded in the blockchain

Smart Contracts are programmable business logic that enables the automation of contracts execution between multiple parties

What are they and how do they work?

Smart Contracts are **software-driven**, **automated** rule-based agreements that require limited human interaction. The program checks if a **pre-defined condition** has been fulfilled and subsequently executes the **embedded logic**. Their outcomes only take affect if there is network consensus for their effect.

Enabling this concept with Blockchain greatly reduces the dependency on third-party validation and automates certain functions; therefore leading to process efficiencies and cost savings.



What are the key benefits?

- 1**
Autonomous in nature
Self governing and self executing. Smart contracts will react automatically to external triggers
- 2**
Trust built in
Smart contracts can only change data state if there is network consensus for that change
- 3**
Replication and backup
Every node on the network has a replicated and in sync copy of the contract. Contracts cannot be deleted
- 4**
Execution speed
Because smart contracts allow manual processes to be pragmatically defined processing times are significantly reduced
- 5**
Cost savings
Smart contracts perform the function(s) of the middleman, therefore there is no need for them saving time and cost
- 6**
Error elimination
Manual tasks can be taken care of by smart contracts eliminating human error

Blockchain enables these business benefits in a shared ecosystem...



Reduction of costs & complexity



Shared trusted transactions



Reduction of fraud



Audit trail & transparency



Security & Immutability



Resilience

...and here are the characteristics where blockchain makes sense



Multiple parties share data
multiple participants need views of common information



Intermediaries add complexity
removal of intermediaries can reduce cost and complexity



Multiple parties update data
multiple participants take actions that need to be recorded and change the data



Time sensitive interactions
reducing delay has business benefits



Requirement for verification
participants need to trust that the actions that are recorded are valid



Transactions interact
transactions created by different participants depend on each other

Blockchain applications are spanning many industry sectors



Produce Tracking

- International connected supply chain systems built using the blockchain verify pork suppliers, shippers, and buyers involved in moving products across countries



Wine Tracking

- Associate each bottle of fine wine as unique physical assets to create a traceable, pseudo-anonymous, decentralized, permanent historical archive all transactions to make digital provenance a reality



Gold Trading

- Quick, transparent, and easy access to bullion markets to ensure investing in physical gold is simple and efficient



Diamond Certification

- Blockchain technology based around Hyperledger Project to enhance security and traceability of Kimberly Process Certificates to prevent fraud against global diamond trading



Real Estate Contracts

- Start-up company building a land title registry for the citizens of Honduras to prove and defend land titles for the first time



Commodity Trading

- Digitization throughout the energy industry has ripple effects in oil production, refining, and shipping as cargo traders are passing title from buyer to shipper to seller through standardized blockchain contracts



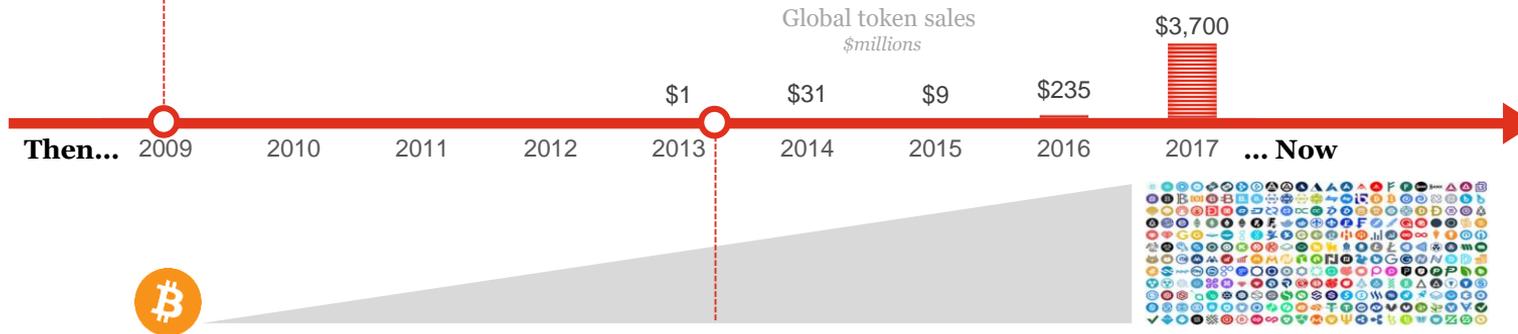


A Blockchain Use Case - Crypto-assets

Let's understand cryptocurrencies and crypto-assets

What is a crypto-asset?

A crypto asset is a medium of exchange, created and stored electronically in the blockchain, using encryption techniques to control the creation of monetary units and to verify the transfer of funds. It is not issued by any central authority.



The total market cap of all coins and tokens
\$455B
(as of 2/23/18)

There are over 1,500 coins and tokens globally
(as of 2/23/18)

All crypto assets are not created equally...

Security token



Digital currency



Asset-backed token

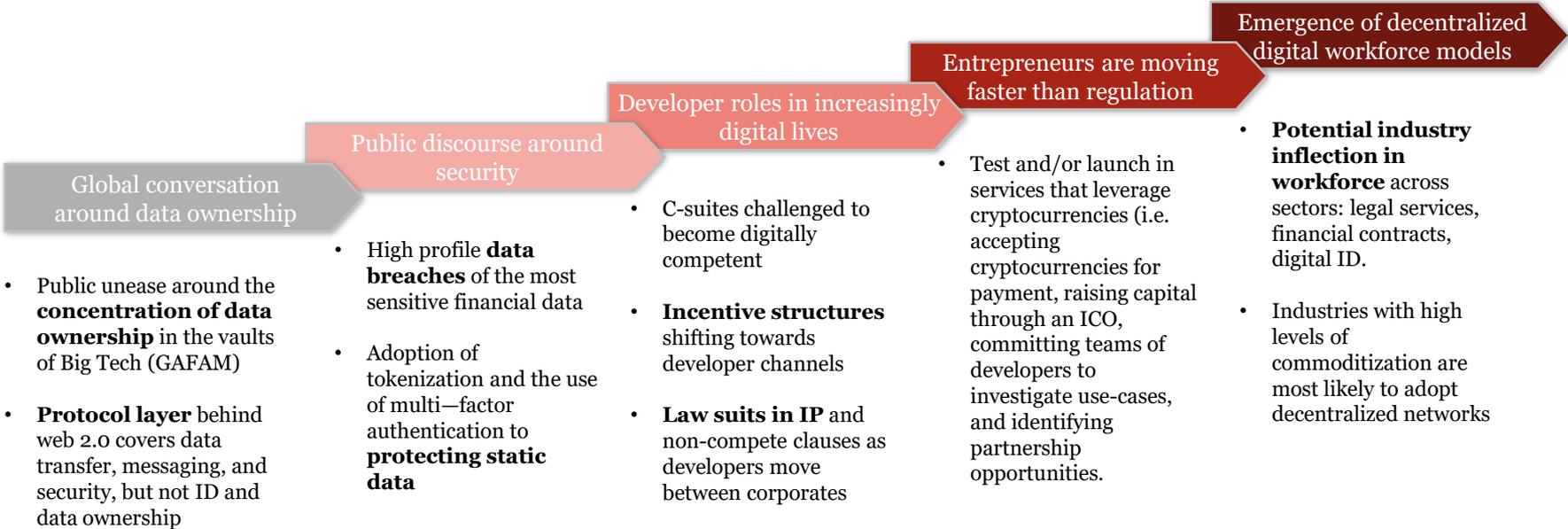


Utility token



Why do crypto-assets require your attention?

Market catalysts that necessitate an assessment of Web 3.0 and decentralized models:



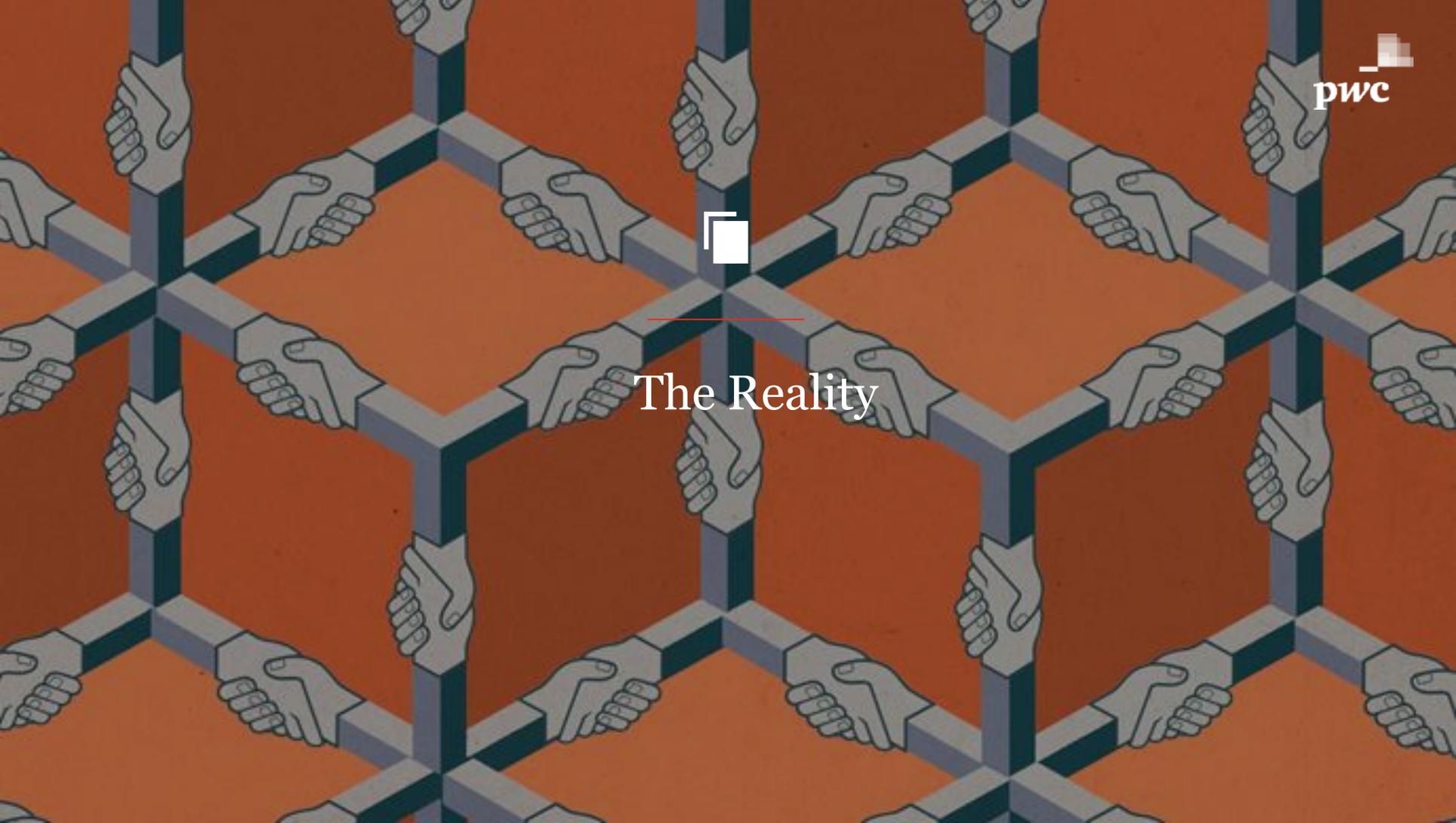
ICO vs. IPO - There are some fundamental differences



ICO	IPO
No specific regulatory framework	Specific and well defined regulatory framework
Generally early stage company	Company needs minimum track record
Funds raised generally for specific purpose	Funds raised for company's long term development
Limited rights given to token holders	Shareholders have well defined rights
Target audience often crypto community	Target audience often institutional investors
No direct economic exposure to issuing company	Provide economic exposure to company
Varied levels of transparency	Prescribed levels of transparency and reports



The Reality



Questions?



Thank you

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