



Institute
and Faculty
of Actuaries

Blockchain and How It Will Change Insurance

Amy Pugh

Brendan Guckian



18 November 2019



Institute
and Faculty
of Actuaries

Introduction

18 November 2019

Biography



Amy Pugh
Senior Manager, Strategy, Innovation & Ventures
 Email: apugh@deloitte.ie

Overview:

As a project and business development senior manager within the EMEA Blockchain Lab, Amy is responsible for leading Blockchain solution projects, proposition design and use case validation engagements for clients across all industry sectors. Amy works with Deloitte's global Blockchain community and clients to build solutions that can solve complex commercial problems and transform the way our clients do business and create value. Amy has led strategic improvement projects focused on custody and banking transformation, process optimisation through robotics and capital markets restructuring.



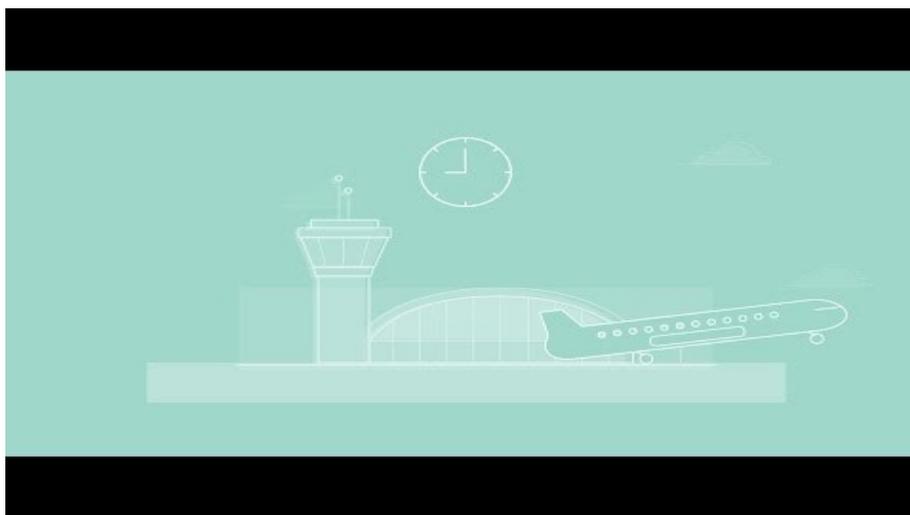
Brendan Guckian
Manager, Actuarial, Rewards & Analytics
 Email: bguckian@deloitte.ie

Overview:

Brendan leads the Deloitte Actuarial Modelling Centre in Ireland, which includes the centre of excellence for actuarial modelling, data warehousing and business intelligence. He is a Fellow of the Society of Actuaries in Ireland and has 10 years of experience in the financial services industry. Brendan experience has been primarily focused in analytic and quantitative roles. He has gained extensive experience in capital and risk modelling including financial planning, stress testing, sensitivity analysis, liquidity testing, capital reserving and stochastic modelling.



Blockchain Overview Video



Purpose of this Presentation

We are aiming to:

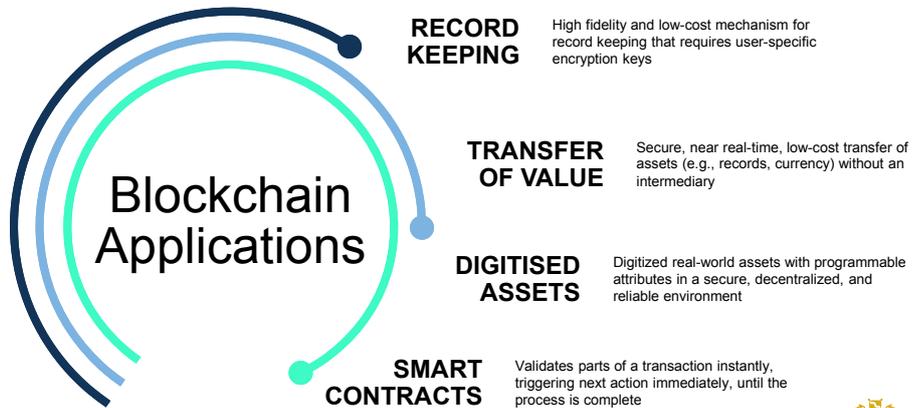
- Explain what is Blockchain and how it works
- Provide some use cases for insurance
- Discuss the concept of Consortia
- Review key adoption challenges and market sentiment
- Key considerations to get started
- Provide an opportunity for questions



Institute
and Faculty
of Actuaries

What is Blockchain and how it works

How should Blockchain be used?

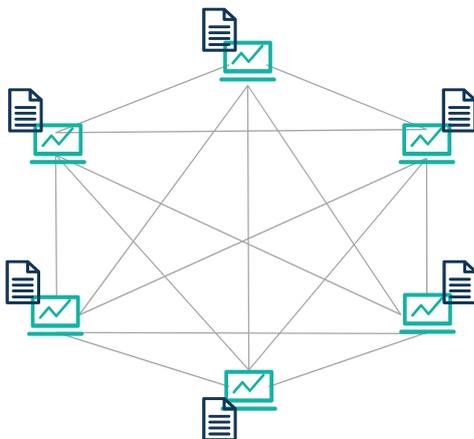


18 November 2019

7

What is Blockchain?

A decentralised, 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:

-  Data
-  Identity
-  Value



8

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)

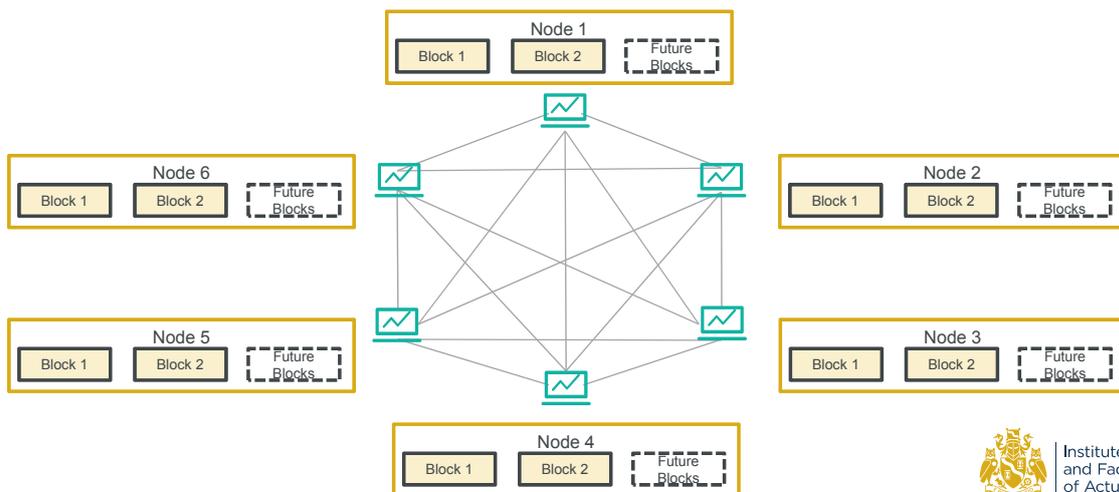
Transactions recorded **chronologically** and **cannot be changed** once added to the chain.

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



Blockchain – Decentralised

Every node maintains an identical copy of the Blockchain – there is no one master node



Consensus

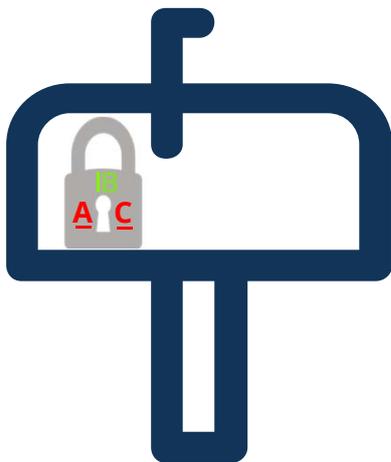
The finality of each new block is agreed via a shared consensus mechanism. The most common mechanisms are as follows

 <p>Proof of Work</p> <p>Perform a mathematical algorithm that is difficult to do, but easy to verify if correct Example: Bitcoin</p>	 <p>Proof of Stake</p> <p>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 Example: EOS</p>	 <p>Proof of Authority</p> <p>Round-robin validation of blocks by authorised validators/nodes Example: Ethereum</p>	 <p>Practical Byzantine Fault Tolerance</p> <p>67% of the authorised validators/nodes must agree on the validity of a block Example: Hypreledger Fabric</p>
--	--	--	--



Cryptography

Blockchain utilises cryptography and a PKI infrastructure to achieve consensus and ensure the immutability of the ledger

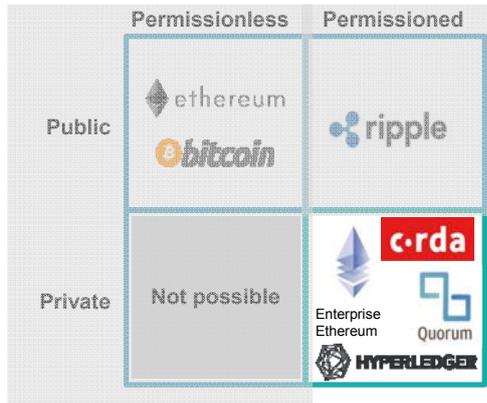


- 1 Public & Private keys are created
- 2 The Public keys are broadcasted to all recipients
- 3 The private key is kept secret
- 4 All messages/transactions are encrypted with the private key
- 5 The message is then sent to a recipient
- 6 The message/transaction can be authenticated and decrypted by anyone with the public key



Public vs. Private Blockchain Platforms

The majority of focus in Financial Services today is around Private, Permissioned Blockchains



- **Public:** all information is transparent to all participants
- **Private:** information is available on a need to know basis (e.g., trade counterparties, regulators)
- **Permissionless:** access to the network is unrestricted.
- **Permissioned:** all network participants are clearly identified (like existing systems)

For the vast majority of enterprise use-case, a permissioned and private network is usually the best fit



Smart Contracts 101

Explanation

Traditionally a contract requires a solicitor to write up, and their language is open to interpretation. They require trust in the other party or a legislator to ensure the terms are acted upon.

A smart contract is a script written in machine readable language, and **deploys automatically** once its conditions are met. At its core, it is a simple **“if-then” statement**.



Automation

Smart contracts **self execute** once its conditions are met, removing the need for trust in the other party to act upon terms of agreement.

Benefits



Integrity

Once a smart contract is put in place, its **terms cannot be tampered with**. As a result a smart contract needs to be heavily audited before being implemented, to ensure no weakness in its code can be taken advantage of.



Transparency

If stored on a private Blockchain, a smart contract's terms and **transactions can be read, but not altered, by both parties**.



Smart Contract Syntax – Fizzy by AXA



Simulation

I enter my flight details



Identity

I fill in my personal information



Delay or cancellation

In case of delay (2h+) or cancellation, my compensation is triggered



Coverage

I personalise my coverage



Payment

I subscribe



Compensation

I receive my indemnity directly into my bank account as soon as the plane lands (or is announced cancelled!)



Institute and Faculty of Actuaries

Blockchain Features and Business Benefits

Transparency



Collaboration (within / cross industry)

Connectivity



Operational efficiency

Automation



Capital efficiency

Traceability



Reduced fraud

Tokenisation



Better Customer Experience

Security



Shorter lead times

Reduced risk of fines

New commercial models



Institute and Faculty of Actuaries



Institute and Faculty of Actuaries

Insurance Use Cases

18 November 2019

Detailed Use Case

Insurance Value Chain

	Pre-Sale	Distribution	Underwriting	Administration	Claims
Insurance functions	P&C	Sales	Risk	Premiums	Processing
	Life	On-boarding	Quote	Compliance	Payments
Insurance activities	Product development	Communication	Background check	Payment notification	Identity verification
	Leads management	Identity Creation	Quote generation	Document management	Calculation/Adjustment
	Offer definition	Planning	Risk calculation	Premium collection	Claim evaluation
	Needs assessment	Application	Binding	Regulatory reporting	Disbursement

Potential Use Case impact from blockchain

None	Low	Medium	High
------	-----	--------	------

Potential benefits

Better Experience

- Frictionless evaluation of claims
- Transparent calculation of premiums
- Automatic receipt of claims and pay outs

Reduced cost and time

- Less resources and lower personnel cost
- Faster quoting-binding and settlement of claims processes
- Savings in terms of underwriting leakages

Further Edge

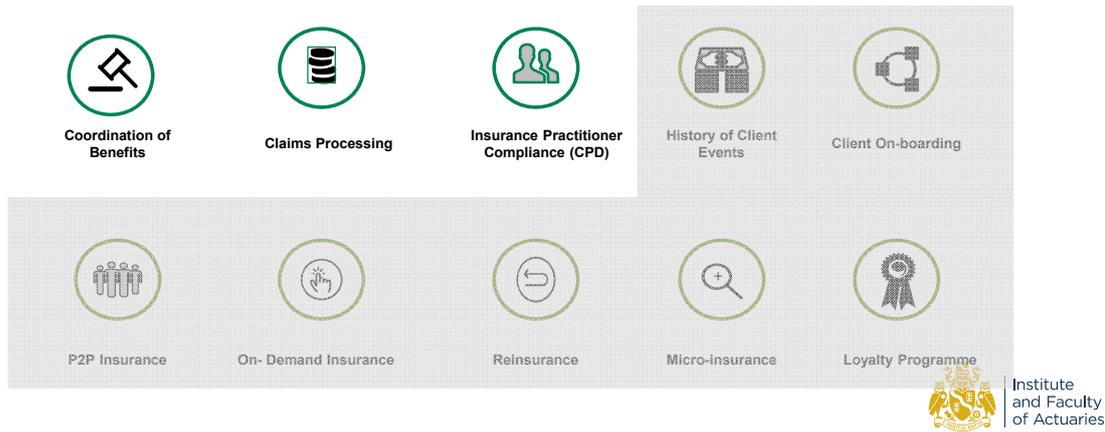
- Digital and innovative vocation of new solutions
- Capitalization of cryptocurrency security
- Enhanced on-boarding and verification of risk



Institute and Faculty of Actuaries

Recap on Blockchain & Insurance Use Cases

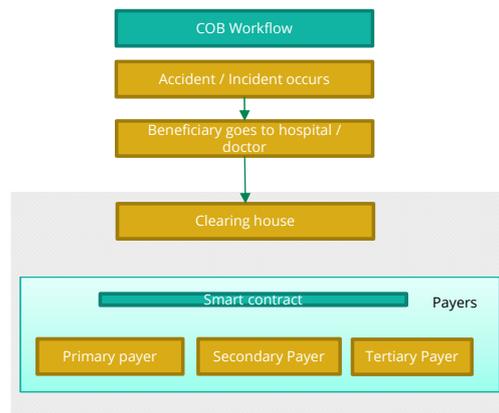
There are some key uses cases in the Insurance sector which are good Blockchain use cases currently being explored



Coordination of Benefits (duel coverage situation)

The COB process enables faster processing of claims in dual coverage situations by ensuring:

- That insurance claims are not paid multiple times when members have multiple insurance plans
- That the primary payer pays first and the remaining portion of the claim not paid by the first insurer is claimed through the second insurer
- That the amount paid by plans in a dual coverage situation does not exceed 100% of the total claim thus avoiding duplicate payments
- COB reduces financial burden over federal and state insurance programmes and helps the beneficiary by optimising the use of health insurance benefits
- The claim is added to the Blockchain and executes a smart contract with a set of rules where the primary insurer pays first, the secondary insurer pays next and so on until all required parties have paid
- There is one single view of all transactions allowing the process to be easily controlled and tracked, protecting both the customer and the insurance companies



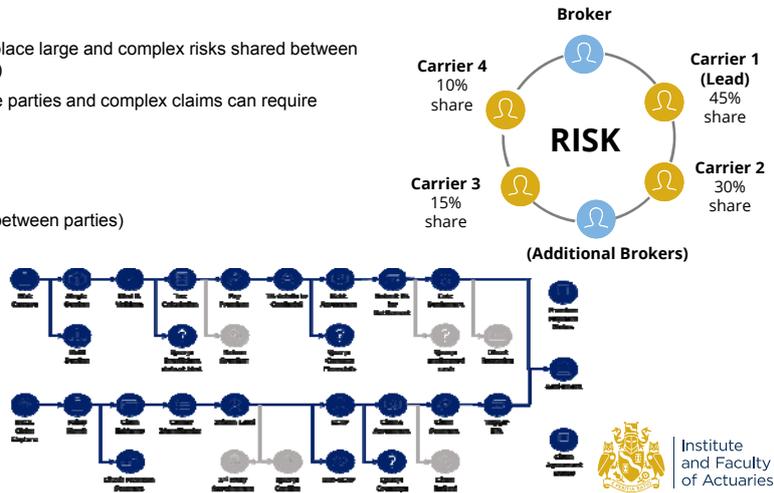
Claims Processing - Deep Dive

Scenario

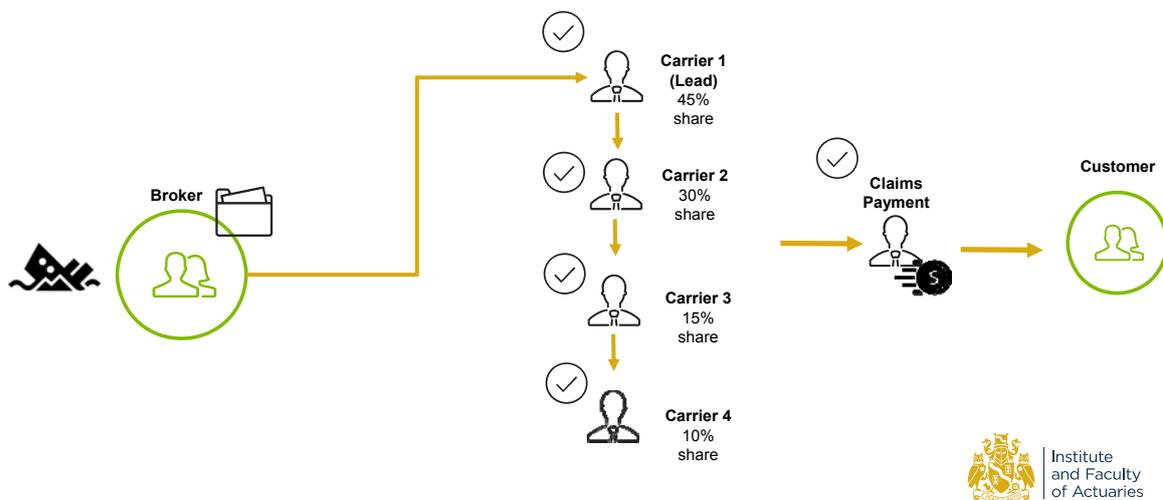
- The client uses a **subscription model** to place large and complex risks shared between multiple carriers (syndicates or companies)
- The clients' claim process involves multiple parties and complex claims can require significant collaboration and negotiation

Key considerations

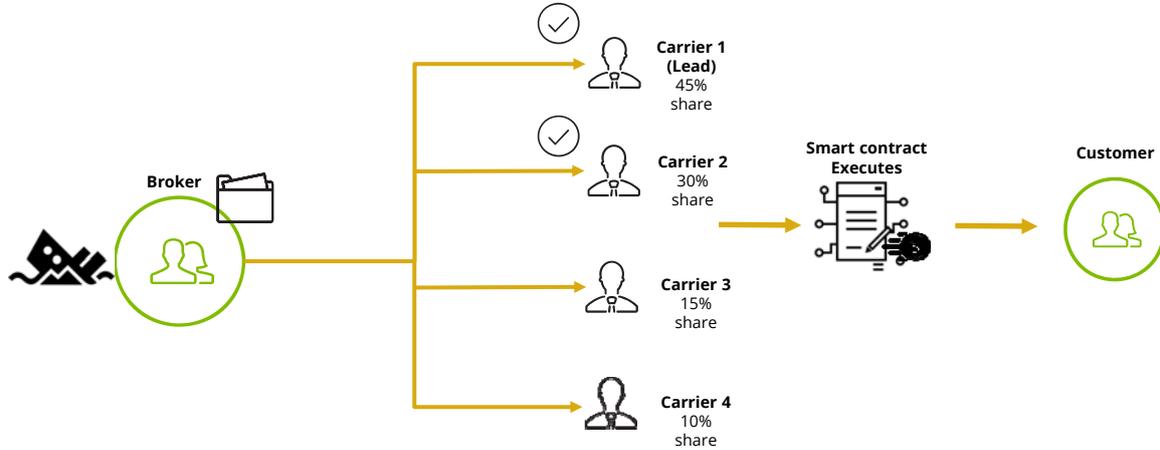
- Security (visibility of sensitive information between parties)
- Speed of settlement
- Straight-Through-Processing
- Real-time, consistent information
- Improved customer experience



Claims Processing - Current Process



Claims Processing - Future Process



Insurance Practitioner Compliance (CPD)

A Blockchain solution to store, share and validate educational qualifications seamlessly between all parties on the chain

The Business Case

A solution based on a secure, shared, platform which enables financial institutions to access trusted data of employee qualifications through a real time link with qualifying bodies, thus eliminating friction and time lags, empowering resources to work on activities that add value and inspire, ultimately improving the bottom line.

In 2017, Deloitte undertook a feasibility study to evaluate the employee qualification management process in collaboration with a leading financial institution. The study revealed the following pain points:



Cost

The current process is labor-intensive and costly.



Time

Involving several teams and manual work, valuable time is wasted in time-lag.



Regulatory risk

Time lags, or human errors, come at the price of fines for being non-compliant.



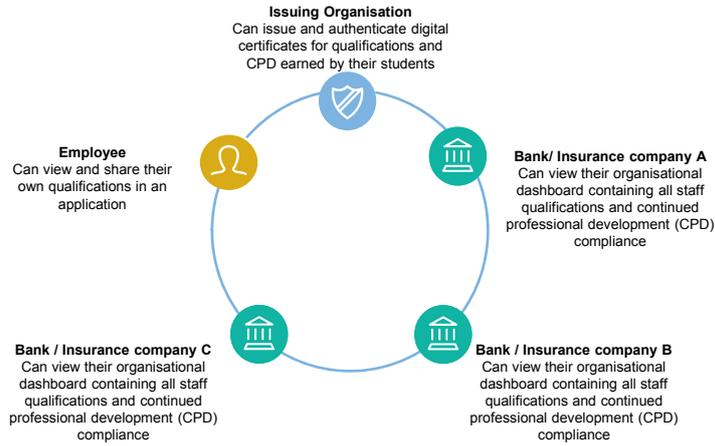
Employees experience

Long on-boarding procedures and delayed acknowledgements of awards damage employees experience.



Insurance Practitioner Compliance (CPD) - Overview of Ecosystem

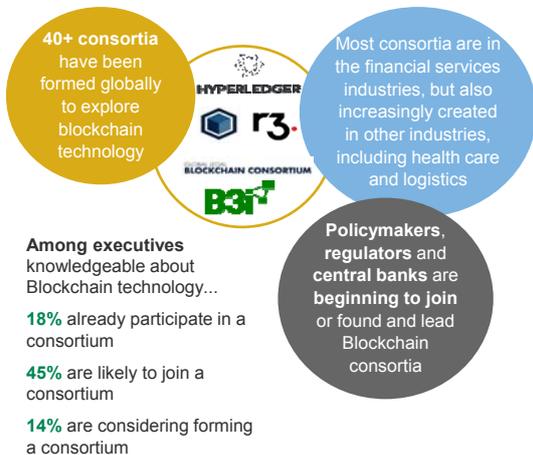
Blockchain permissioned repository for qualifications that can be shared within and across organisations



Institute and Faculty of Actuaries

Consortia

Blockchain Consortia



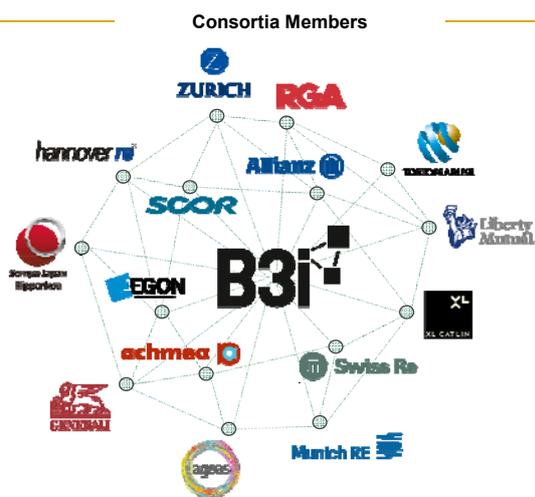
Advantages of Blockchain Consortia

When exploring Blockchain technology, many companies decide to join a consortium. This has multiple advantages over independently developing a Blockchain solution:

- Network effects**
By the nature of the technology, Blockchain solutions create more value in a network
- Low risk**
In joining a consortium, companies take a comparatively low risk (financial investment or development resources) in return for the opportunity to experiment with a disruptive technology
- Sharing knowledge**
By working with different companies, consortium members can share and extend their own knowledge



B3i – Insurance Agreements on a distributed ledger



Objectives and Governance

A consortium comprised of leading global reinsurers who aim to remove friction in risk transfer in the insurance industry.

- Legal-set-up** (incl. Funding & IP, Owner- / membership model)
 - Equity-funding by initial founding members (closure of second financing round anticipated soon)
 - IP was moved to B3i AG
 - So far, shareholders hold equal shares
- Business Model** (incl. incentives, profit orientation, tech vs. business orientation)
 - For-profit organization
 - Slogan: By the industry for the industry
 - Industry orientation with own proprietary platform based on Corda
- Operating Model** (incl. Decision Making, Platform management)
 - Regular shareholder meetings
 - Each shareholder holds one vote; all votes are equal
 - B3i as the central entity and orchestrator of the network



B3i – Use Case deep dive



Why come together?

B3i is creating a better insurance industry by developing standards, protocols and network infrastructure to **remove friction in risk transfer**. B3i's shareholders and participants believe that new technologies can give end consumers of insurance better and faster access to insurance.

By **acting together**, they can optimise and automate market-wide processes, generating significant savings in time and cost that cannot be achieved by insurers or intermediaries acting alone.



Participants



How they do it

A platform built on Distributed Ledger Technology can **eliminate the duplication of data** across applications, systems, and parties – along with the friction generated by duplication and degradation of quality.

DLT guarantees that counterparties see an **indisputable single view of shared data** which obviates wasteful and error prone processes such as reconciliations. Shared applications that **address common industry problems** will provide a platform for individual participants to execute their digital transformation strategies.



Institute and Faculty of Actuaries



Institute and Faculty of Actuaries

What are the top challenges for adoption?

What are the top challenges for adoption?

— **Standardisation and interoperability** — **Governance** — **Uncertain regulatory landscape** —

Lack of standardisation creates challenges to collaborate on application development, validate proofs of concept, and share Blockchain solutions as well as integrate with existing systems.

The success of blockchain lies in the ability for multiple Blockchains to integrate such that the user can interact with other users regardless of blockchain platform

Blockchain is an ecosystem play where participants come together to solve problems or seize opportunities within the market. Implementing an effective governance and operational structure for the ecosystem is critical but difficult. Participants need to be incentivized to join, buy-in is required from decision makers; participants must be willing to commit time and resources to support the initiative.

Building a community platform in addition to the technical platform is key for stakeholder engagement, adoption and ultimately scale.

Inconsistent regulatory landscape across the world due to lack of understanding, wide-scale confusion, and no legal precedent for decentralised platforms

No consensus reached among most U.S. regulatory bodies focused on cryptocurrencies:

SEC1: (security)

CFTC2: (commodity)

FinCEN3: (currency)

IRS4: (property)



Institute and Faculty of Actuaries

What is the market telling us?

Deloitte 2019 survey of senior executives

53%
consider blockchain as a
top 5 strategic priority



40% will invest **\$5M+** in
Blockchain coming year



Our organisation sees a compelling business case for the use of Blockchain



Blockchain is broadly scalable and will reach mainstream adoption



Planning on replacing current system of record

In the news..

B3i - A true industry collaboration



B3i, a consortium startup working to use Blockchain tech in the insurance industry. COINDESK



Libra and JPMcoin, two recent examples of major companies working on stablecoin projects. MEDIUM



Insurance giant Allianz is working on a token-based Blockchain ecosystem COINTELEGRAPH

* From March 2019 Deloitte Global Blockchain Survey of 1,386 senior executives from mostly large companies (> \$500M for US, > \$100M countries outside US) across industries



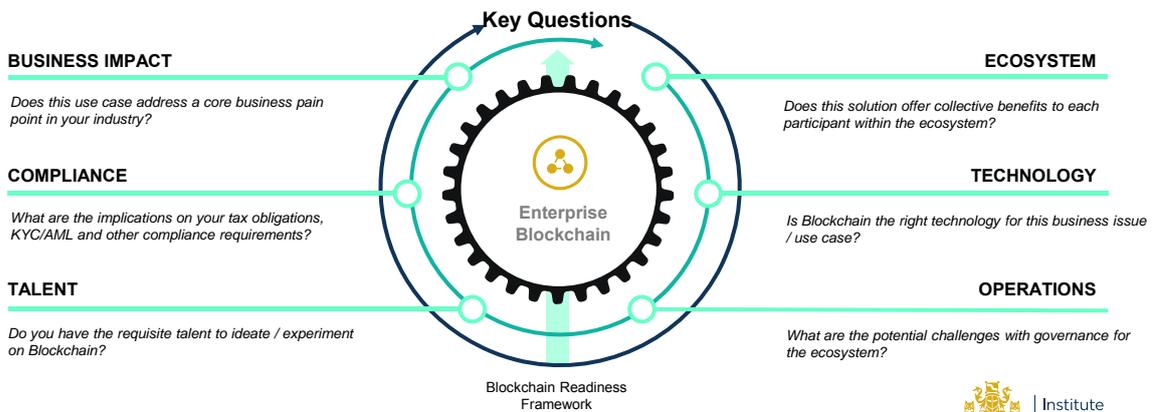
Institute and Faculty of Actuaries



Key considerations to get started

18 November 2019

What are the key questions you should consider?



18 November 2019



Questions

Comments

The views expressed in this [publication/presentation] are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this [publication/presentation] and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this [publication/presentation].

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this [publication/presentation] be reproduced without the written permission of the IFoA [or authors, in the case of non-IFoA research].

18 November 2019

Institute
and Faculty
of Actuaries

36