Agenda

• The Protection Gap
• Frictionless Risk Transfer
• How Technology Can Help
• Benefits and Outlook
Protection Gap
Significant Under-insurance
Across regions and classes of business

- Large part of [natcat] risks non-insured
- Insurance relying on subsidies
- Growing pension funding shortfalls
- Rising medical and health insurance costs
- Preference to share rather than own
- Global citizens wanting global cover

A growth market!
Listen to the customer and invent for the customer.

Jeff Bezos, Founder and CEO, Amazon
The Era of the “Customer”
Needs Have Changed

• People want efficient identification process
• They have a profile to share
• Don’t want Tech to bring vendor lock-in
• Expect more intelligent claims management
• Want (insurance) companies to co-ordinate
• Customisation through standardisation

Our response?
Frictionless Risk Transfer
# Network Health Test

Less frictions make healthier network

<table>
<thead>
<tr>
<th>Trust</th>
<th>Network</th>
<th>Intermediaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operative spirit</td>
<td>Operating as a</td>
<td>Intermediaries add</td>
</tr>
<tr>
<td>brings high trust</td>
<td>network brings</td>
<td>efficiency, speed</td>
</tr>
<tr>
<td></td>
<td>value</td>
<td>and value</td>
</tr>
<tr>
<td>3.0</td>
<td>2.0</td>
<td>2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Updating</th>
<th>Transacting</th>
<th>Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>All parties agree</td>
<td>Smart contracts</td>
<td>Shared and reliable</td>
</tr>
<tr>
<td>changes to data</td>
<td>reliably automate</td>
<td>data ownership</td>
</tr>
<tr>
<td></td>
<td>mutual processes</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>1.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Average Score** (sum of scores / 6)

<table>
<thead>
<tr>
<th>Strong networks</th>
<th>4-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak networks</td>
<td>1-5</td>
</tr>
<tr>
<td><strong>Insurance</strong></td>
<td><strong>1.8</strong></td>
</tr>
</tbody>
</table>

Insurance dilemma:

**High trust**

**&**

**High frictional cost**
Root Cause of Frictions
Reinsurance Risk Transfer – B3i’s Use Case

Traditional ledger

- Slow
- Contract uncertainty
- Operational Risk
- Data quality issues
- Cumbersome reconciliations
- Working capital

Distributed ledger

- Automatic Validation
- Reporting

Shared ledger

- Automatic Validation
- Reporting

Data Input

- $
Entire value chain is ripe for automation

Transaction flow across multiple layers of counterparties within the “Digital Vault” enabled by Smart Contract & Blockchain
A Closer Root Cause Analysis
Process Friction Points

<table>
<thead>
<tr>
<th>Process</th>
<th>Challenges</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk underwriting</td>
<td>Contract (un) certainty and identity management</td>
<td>Immutable contract logic with digital validity</td>
</tr>
<tr>
<td>Policy/Premium Management</td>
<td>Manual processes, pairing and latency</td>
<td>Dispute-less and self-executed IoUs</td>
</tr>
<tr>
<td>Claims Handling</td>
<td>Data duplication, inefficiency and fraud risk</td>
<td>Central truth, event oracles and smart contract rules</td>
</tr>
<tr>
<td>Financial Settlement</td>
<td>Settlement and reconciliation latency</td>
<td>Peer-to-peer, netting and friction-less</td>
</tr>
</tbody>
</table>
How Technology Can Help
A Blockchain primer

Bitcoin is a blockchain, but not all blockchains are bitcoin

2008: Bitcoin introduces the first distributed system
A Blockchain primer
Bitcoin is a blockchain, but not all blockchains are bitcoin

2008: Bitcoin introduces the first distributed system that can run on anybody’s computer
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2008: Bitcoin introduces the first distributed system that can run on anybody’s computer implementing a distributed, digital currency
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2008: Bitcoin introduces the first distributed system that can run on anybody’s computer implementing a distributed, digital currency, maintaining a replicated, globally accepted world state.
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2008: Bitcoin introduces the first distributed system that can run on anybody’s computer implementing a distributed, digital currency, maintaining a replicated, globally accepted world state. The system maintains its properties even in presence of corrupted/malicious nodes!
A Blockchain primer
Bitcoin is a blockchain, but not all blockchains are bitcoin

2013: Ethereum introduces smart contracts

The system maintains its properties even in presence of corrupted/malicious nodes!!
A Blockchain primer
Bitcoin is a blockchain, but not all blockchains are bitcoin

2015: permissioned blockchains introduce strong identity management (who’s who)

The system maintains its properties even in presence of corrupted/malicious nodes!!
A Blockchain primer
Bitcoin is a blockchain, but not all blockchains are bitcoin

2015: permissioned blockchains introduce strong identity management (who’s who) and access control (who can do what)

The system maintains its properties even in presence of corrupted/malicious nodes!!
Permissioned Blockchains: a digital board game

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How to apply in re/insurance
Technology with a purpose

Risk underwriting

Policy/Premium Management

Claims Handling

Financial Settlement

Process

Challenges

Solutions

Contract (un)certainty and identity management

Manual processes, pairing and latency

Data duplication, inefficiency and fraud risk

Settlement and reconciliation latency

Immutable contract logic with digital validity

Dispute-less and self-executed IoUs

Central truth, event oracles and smart contract rules

Peer-to-peer, netting and frictionless
Contract Inception

What is being agreed?
Who’s agreeing to it?
How can it change?
Contract Inception

What is being agreed?

• terms/obligations encoded as a computer program
  – No room for ambiguity
• state immutably stored in the ledger
  – Perfect instrument for auditing/settling of disputes
• terms might be kept hidden to all but the legitimate parties (and auditors)

Who’s agreeing to it?

How can it change?
What is being agreed?

Who’s agreeing to it?

• easy to identify participants since in a permissioned blockchain, strong identity management is already in place

• no need for centralized way of managing identities: every org in a permissioned blockchain
  – has the monopoly on issuing credentials for its entities and
  – shares with everyone else the means of determining whether an entity belongs to its org

• unlinkability and pseudoniminity protect the identities of parties wrt. others
  – shared platform can be used to conduct private business

How can it change?
What is being agreed?
Who’s agreeing to it?
How can it change?

• Artifacts in a permissioned blockchain (e.g. smart contracts) come with a namespace and a set of definable, flexible modification policies
  - “adding a new clause can be authorized by 3 out of 5 members with a certain role”
  - “adding a new member can be authorized through a unanimous agreement of existing ones”
  - “a hidden policy is defined and its fulfillment is proved in zero knowledge”
Once we have...  
• secure and efficient ways of determining who's who and who can do what...  
• ...captured the business logic into a chaincode  
activation and processing of a smart contract is very a simple matter of course

The system is designed to avoid any disputes, because  
• rules on how to process disputes are part of the definition of the system  
• the ledger is an immutable audit trail that can be used to settle any dispute

Permissioned blockchains deliver superior performance because  
• don't need to create external incentives (e.g. miners’ reward)  
• can replace expensive PoW-based consensus with more efficient BFT  
• (parallel) execute-order-validate can replace (sequential) order-execute
Claims

- The ledger is the globally accepted source of truth for all participants; it records all the actions happening in the system.
- **What about exogenous variables**, i.e. what happens outside the system?
  - an event in the real world triggering a claim
  - Currency conversion

- Blockchain systems use so-called **oracles** to learn facts about the real world.
Claims

Oracles can
• either be trusted third parties acting as a data source
• the collective input from a majority
• The consortium can in turn offer an oracle service

So far we've seen the ledger as this (relatively inefficient data structure)
• the ledger is a potentially invaluable source of data for analytics. Blockchain can expose services (forecast, modeling, fraud detection) on top of what it has learned so far
Financial settlement

There are different ways a blockchain can help with the settlement of financial obligations
• interface with external systems (SWIFT, CLS, banks) to carry out payments
• crypto currency built in the blockchain system
• digital IOUs/promissory notes/note payables issued by transactors and stored in the ledger ~ real money

The blockchain can also help optimize these, for instance by performing netting and creating regular payment cycles
• potentially it can also create an internal market place to trade/hedge those
Benefits & Outlook
As the network is growing...

B3i’s Rapid Growth to 38 Members

**Market Testing Participants** (Cat XoL Product)

- 2017 - Complete market testing
- 2018 - Entity incorporation, product enhancement and first live transactions
... we move into market testing (Market Testing snapshot 13.10.2017)
B3i members firms currently transacting contracts on sandbox platform (Market Test 9 Oct – 9 Nov 2017)
... and further articulate our business case
Overview of key blockchain benefits as seen by Swiss Re and B3i

<table>
<thead>
<tr>
<th>Working Capital Improvement</th>
<th>Operational Efficiency and Risk Reduction</th>
<th>Quality and Integrity of Data</th>
<th>Foreign Exchange Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster and more efficient premium and claims settlement and optimised liquidity management</td>
<td>Reduction of contract uncertainty, reconciliations and process inefficiencies</td>
<td>Normalised and high-quality data in a shared source with central control over integrity and easier auditing</td>
<td>Accelerated FX transactions and consistent valuation</td>
</tr>
</tbody>
</table>

Positive Impacts:
- **Combined Ratio** – conservative estimate of -0.5%
- **Improved liquidity**
- **Risk Reduction**

... with a strategic outlook and business plan
“Masterplan” – how we see use cases develop in re/insurance

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing baseline</td>
<td></td>
<td>At later stage and in synergy with other technology such as IoT, Robots, Chatbots, Sensors, AI</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Reinsurance</th>
<th>Commercial Insurance (wholesale – B2B)</th>
<th>Primary Insurance (retail – B2C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materiality</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Transaction volume</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Homogeneity</td>
<td>High (global)</td>
<td>Medium (international)</td>
<td>Low (local)</td>
</tr>
<tr>
<td>Data privacy</td>
<td>Medium</td>
<td>Medium</td>
<td>High (sensitive, regulated)</td>
</tr>
<tr>
<td>Diversity of regulation</td>
<td>Medium</td>
<td>Medium</td>
<td>High (per jurisdiction)</td>
</tr>
</tbody>
</table>

- **Gradual expansion** of blockchain applications across industry value chain
- **Reinsurance good starting basis** with less diversity and ability to reach scale quickly
- **B3i legal entity** in process of being established and expected operational early 2018
Thank you

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www.b3i.tech

References:
2. https://www.youtube.com/watch?v=QOoZqlUYrws
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