Blockchain Overview
What is Blockchain?
It’s important to highlight that blockchain is just one tool to consider when contemplating digital transformation.

**Blockchain**
A decentralized ledger of all transactions in a network aimed to increase security, reduce cost, decrease transaction time, and increase transparency all while eliminating the need for a trusted third party.

**Artificial Intelligence**
Intelligence exhibited by machines that mimic cognitive functions to perceive its environment and take actions to maximize a certain goal.

**Other Technologies**
Other trends include Data COE’s, EPM Platforms & Data Lakes, “Perform” for SSC’s, Global Business Services & Integrated business planning.

**Internet of Things**
Allows different devices to send and receive data enabling better connectivity, and data processing, and analytics.

**Robotic Process Automation (RPA)**
Allows for deployment of a Digital Workforce by creating a virtual human being to manipulate existing software applications.

**Cloud Technology**
Cloud technologies are providing greater flexibility for the workforce, improved productivity, broader insight, and higher efficiency at lower costs as compared to on-premise solutions.
To level set, Blockchain is **NOT** necessarily Bitcoin

1. Blockchain, *does not* require crypto-currency.
2. The platform can be constructed to handle a varying set of rules and configurations.
3. Related technology, such as smart contracts, can greatly improve process efficiency, transparency, reliability and reduce risk.

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1. A crypto-currency is merely *one application of* crypto-technology, allowing the transfer of value via transactions recorded on a Blockchain.
2. There are many existing crypto-currencies, most notably Bitcoin, operate on PUBLIC and PERMISSIONLESS networks.
3. They are not tied to an “observable” asset or index creating price volatility.
The underlying distributed ledger layer can enable business and operations transformation

**What is blockchain?**

A blockchain is a decentralized ledger of all transactions in a network. Using blockchain technology, participants in the network can confirm transactions without the need for a trusted third party intermediary.

Someone in a network requests a transaction

The transaction is broadcast to other computers (nodes) in the network

The network of nodes validates the transaction using agreed algorithms

The transaction is complete

The new block is added to the network’s blockchain, in a way which is permanent and unalterable

The verified transaction is combined with other transactions to create a new block of data for the ledger
The Blockchain ecosystem leverages the following technological advancements to drive digital marketplaces

**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

**What does this mean for your organization?**

- Near real-time data availability and transparency that can eliminate the need for reconciliation
- Prevents unwanted intrusion on the network from non-authenticated participants
- Facility for peers in the network to validate updated information ensuring validity and integrity of the data on the chain
- Facilitates the ability to design and implement shared workflow and enhance automation
Blockchain enables key benefits by connecting the Internet of Things and the Internet of Information to the Internet of Value

<table>
<thead>
<tr>
<th>Reduction of costs &amp; complexity</th>
<th>Shared trusted transactions</th>
<th>Reduction of fraud</th>
<th>Audit trail &amp; transparency</th>
<th>Security &amp; Immutability</th>
<th>Resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
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Modern digitization tools provide benefits to some, but not all parties in a multi-party business process.

What is “Modern Digitization”? Modern Digitization is the practice of moving previously physical and/or manual documentation, interaction, and other key business processes onto a software-based platform.

Modern Digitization can have many benefits...

- Reduce Manual Efforts
- Improve Collaboration
- Increase Efficiency

...as well as many limitations...

- Manual effort still exists in reconciling updates to centralized source
- Transactions still need to be approved by a trusted third party
- Latency still exists due to party synchronization

...blockchain can help transcend some of those limitations

- Updates made will instantly reconcile to single source of truth held by all parties
- Consensus algorithms enable automatic transaction approval
- Combination of distributed data and pre-determined rules further reduce errors and lag time
The following criteria can help an organization determine whether a blockchain-enabled solution is appropriate

<table>
<thead>
<tr>
<th>Multiple parties share data</th>
<th>Multiple parties update data</th>
<th>Requirement for verification</th>
<th>Intermediaries add complexity</th>
<th>Time sensitive interactions</th>
<th>Transactions interact</th>
</tr>
</thead>
<tbody>
<tr>
<td>multiple participants need views of common information</td>
<td>multiple participants take actions that need to be recorded and change the data</td>
<td>participants need to trust that the actions that are recorded are valid</td>
<td>removal of intermediaries can reduce cost and complexity</td>
<td>reducing delay has business benefits</td>
<td>transactions created by different participants depend on each other</td>
</tr>
</tbody>
</table>
Blockchain-enabled transformation poses a few key challenges
Blockchain Insurance Opportunities
Initial insurance use case themes

Source: Digital Currency Group

“Bitcoin will do to banks what email did to post offices.”
- Rick Falkvinge (Swedish Politician)
# Running List of potential problem statements for RGA

<table>
<thead>
<tr>
<th>#</th>
<th>Idea Name</th>
<th>Function</th>
<th>Problem</th>
<th>Hypothesis solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>De-identified PII</td>
<td>Ops</td>
<td>Can we reinsurer de-identified data</td>
<td>PII is transferred out of process – avoid claims adjudication on death</td>
</tr>
<tr>
<td>2</td>
<td>Micro-insurance</td>
<td>Lead Gen</td>
<td>Admin costs kill micro insurance cover</td>
<td>Offer MFI NGOs a smart contract available in building blocks $1 gets 1k, on par chassis with 30% experience refund</td>
</tr>
<tr>
<td>3</td>
<td>Bilateral derivatives</td>
<td>Invest.</td>
<td>Avoid going through clearing houses</td>
<td>Speculate on underlying assets</td>
</tr>
<tr>
<td>4</td>
<td>IUC process improvement</td>
<td>Treasury</td>
<td>Legal workflows for 20 vs 600 payments</td>
<td>Create a smart contract workflow that removes manual work</td>
</tr>
<tr>
<td>5</td>
<td>Client Claims Payments</td>
<td>USMM</td>
<td>Simplify reconciliation with contracts and reduce excess liquidity in various accounts</td>
<td>Build a consortium that brings together top talent to attack infrastructure</td>
</tr>
<tr>
<td>6</td>
<td>Jumbo census</td>
<td>Fraud</td>
<td>Jumbo is massive problem in non MIB markets</td>
<td>Build protocol based on our RI admin to put identifies onto decentralized ledger</td>
</tr>
<tr>
<td>7</td>
<td>Auto claims management</td>
<td>Claims</td>
<td>Claims payment is a manual or expert based system</td>
<td>Create a smart contract that reduces claims based on smart contracts with immutability</td>
</tr>
<tr>
<td>8</td>
<td>In-force risk exposure</td>
<td>GAIM</td>
<td>Uncertain which risks and volatilities existed and when</td>
<td>Automate premiums and payments to reduce volatility</td>
</tr>
<tr>
<td>9</td>
<td>Captive on demand</td>
<td>GFS</td>
<td>Creating sidecars with lawyers is taxing</td>
<td>Create zero person insurance companies on demand that are rules based based</td>
</tr>
<tr>
<td>10</td>
<td>STOLI killer</td>
<td>Lead Gen</td>
<td>Consumers can’t continue to pay and life</td>
<td>Consumers trade policies, with immutable</td>
</tr>
</tbody>
</table>
Who is the B3i? (blockchain insurance industry initiative)

- **Vision:** Jointly explore the potential of Blockchain technology with industry-wide use cases to better serve end-clients.

- **Initiative launch date:** October 2016, foundation meeting took place at Swiss Re.

- **Focus:** A first pilot project for Excess of Loss Natural Catastrophe (ELNC) insurance contracts between the participating companies.

**SOURCE:** http://www.rgare.com/media/rga-in-the-news
Changing how data, claims, capital, payments are disclosed, used, automated and managed

What has B3i been working on?

- Prototyping a simple P&C Cat XoL reinsurance contract
  - Test running it on a Hyperledger Blockchain platform
- Reuse existing industry wide standards (Acord) wherever possible
- Documenting a business case that predicts a 30% efficiency gain on operating expenses

Why is RGA participating?

- Reimagining future treaty data flows with major competitors and clients
- Joint Ownership of intellectual property produced
- Benchmarking capabilities of blockchain providers
Secure P&C Data Flow overview
I've hired a consultant to help us evolve our products to use blockchain technology.

Blockchain! Blockchain! Blockchain! Blockchain! Blockchain! Blockchain!

It's as if you're a technologist and a philosopher all in one!

Blockchain. Sidechains.
IT’S TIME TO REIMAGINE, RETHINK AND REINVENT INSURANCE TO MAKE LIFE BETTER.
Blockchain: Legal, Compliance and Regulatory Implications
The legal and compliance framework for blockchain-enabled technology is complex...

- Number of legal and regulator issues to be resolved prior to widespread implementation of blockchain technology in the insurance industry
  - Jurisdictional Issues
  - Governance / Liability
  - Security
  - Data Privacy
  - Contract Law
…particularly for the highly regulated insurance industry

- Regulatory Landscape
  - Supervision of development, implementation and ongoing use of technology
  - Customer protection
  - Books and records
  - AML
  - Cybersecurity/ data privacy
  - Business continuity
  - Issues around peer-to-peer insurance
Blockchain technology as a tool for insurance regulators to more efficiently regulate the industry

- At the same time, blockchain may also emerge as a tool for insurance regulators to more efficiently regulate the industry
  - Supervision of development of technology, implementation and ongoing use
  - Transaction reporting to regulators
  - Examinations