Understanding Blockchain Technology and Its Insurance Implications
The Griffith Insurance Education Foundation, an affiliate of The Institutes, is a 501(c)(3) non-profit, non-partisan, and non-advocative educational organization dedicated to the teaching and study of insurance and risk management.

In keeping with the non-partisan, non-advocative mission of The Griffith Foundation, I will keep my comments and contributions to today's program unbiased and purely educational.

Outline for Today’s Discussion

**Part 1**  
Technological Advancement: The Building Blocks to the Blockchain

**Part 2**  
The Economics of Cryptocurrency and Blockchain

**Part 3**  
What Exactly is a Blockchain? What does it do?

**Part 4**  
Overview of Blockchain in Business

**Part 5**  
Blockchain in Insurance
Part 1

The Building Blocks to the Blockchain

Blockchain Stems From Advances in Technology
Part 2

The Economic Origins of Cryptocurrency and Birth of the Blockchain

The Economic Environment During the Formation of Bitcoin

Look Out Below...

More than half of mortgage originations were ARMS at the height of the housing bubble.

The Fed responded to the crisis by expanding the Money Supply and cutting rates... to near 0%.
So, Why Did We Discuss Economic History?

One reason was to point out the economic environment at time of the creation of Bitcoin, but another was to point out its similarities with...

**Gold:**
- Scarce
- Mined
- Can Be Used as Money
  - Medium of Exchange
  - Unit of Account
  - Store of Value
- Hedge Against Inflation
First Transaction: 10,000 Bitcoins for Two Pizzas

10,000 bitcoins now worth $23 million

Part 3

What Exactly is Blockchain? What Does it Do?
Blockchain Fuses Database with Network and Establishes Trust

Blockchain is a distributed database and shared ledger that maintains a continuously growing list of chronologically added records called blocks. In most blockchains new blocks and the data within (transactions, smart contracts, and so forth) are confirmed and verified through a decentralized consensus process called mining. This verification process removes intermediary validation and establishes trust without the use of a centralized authority.

Blockchain:
- Adding anything to ledger is permanent
- Solves double-spending problem
- Establishes trust and eliminates middlemen which:
  1) increases security
  2) tears down walls
  3) speeds up transactions
  4) improves privacy

How the Blockchain Process Works

1. John wants to send a bitcoin to Jane.
2. The pending transaction is broadcast to the network.
3. Every 10 minutes, miners combine pending transactions, like John and Jane’s, into a block.
4. Miners race to solve a computational puzzle. Miners reach consensus and approve the block. The winning miner receives new bitcoins.
5. The block is added to the blockchain.
6. Jane receives the bitcoin from John.

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Other Blockchains: Ethereum

Ethereum is a public blockchain-based distributed computing platform, featuring smart contract functionality. It provides a decentralized virtual machine, the Ethereum Virtual Machine (EVM), that can execute peer-to-peer contracts (smart contracts) using a cryptocurrency called Ether.

Why the Ethereum Blockchain?

- **Smart contracts**
  - Blockchain-based contracts, fully self-executing

- **DAPPs**
- **DAOs**

Many technological differences with Bitcoin:
- Shorter block times (Ethereum about 15-17 seconds; Bitcoin about 10 minutes)
- Universal programming language
- Ether likened to “gas”
- ASIC-resistant (huge mining rigs used in Bitcoin)
- Others

- Executed by the platform
- Validated and enforced by platform
- Can’t be removed
Part 4

Overview of Blockchain for Business

Public, Private and Hybrid Chains

**Public blockchain:** A public blockchain is a platform where anyone on the platform would be able to read or write to the platform. This is a fully decentralized blockchain.

**Private blockchain:** A private blockchain allows only the owner to have the rights on any changes that have to be done. This could be seen as a similar version to the existing infrastructure wherein the owner (a centralized authority) would have the power to change the rules, revert transactions, etc. based on need.

**Hybrid (or consortium) blockchain:** A consortium blockchain would be a mix of both the public and private. With a consortium chain the ability to read and write could be extended to a certain number of parties/nodes. This could be used by groups of organization/firms, who get together, work on developing different models by collaborating with each other. Hence, they could gain a blockchain with restricted access, work on their solutions and maintain the intellectual property rights within the consortium.
A Few Non-insurance Use Cases Under Development

1. Automobile Sales: Visa/DocuSign: Car Leasing
2. Accounting: Big Four: Triple Entry Accounting
3. Banking: R3 and EntEth: Cross Border Trading
4. Education: Academic Records
5. Energy: Paid Energy Trades
6. Healthcare: IBM and FDA Align to Boost Public Health
7. Internet of Things: Ethereum IoT Registry
8. Mass Media Entertainment: Disney’s Dragonchain
9. Social Media: Steemit: Social Media on Blockchain
10. Supply Chain: Walmart: Supply Chain Management

How Blockchain Will Change Insurance and Risk Management

**What does the blockchain offer?**
- Immutability
- Decentralized Consensus
- Security
- Trusted Process
- Smart Contracts
- Other

**What could this mean?**
- Audit trail
- Disintermediation
- Potential for Self-sovereign Identity
- Risk Registries
- Faster Transactions
- Other
Part 5

Blockchain in Insurance

Blockchain Can Help With Insurance Pain Points

Common Themes:
- Automation
- Improved 3rd party integration
- More extensive market reach
- Greater efficiency

Insured Pain Points
- Poor Customer Experience
- Slow Entry Into Emerging Markets
- Weak Product Innovation

Insurer Pain Points
- High Administrative Costs
- Costly Intermediaries
- Fragmented Data Sources
- Manual Processes
- Fraud Prone
- Stringent Regulation

Common Themes:
- Automation
- Improved 3rd party integration
- More extensive market reach
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Blockchain Use Cases Across Entire Insurance Value Chain

<table>
<thead>
<tr>
<th>Products, Pricing and Distribution</th>
<th>Underwriting and Risk Management</th>
<th>Policyholder Acquisition and Servicing</th>
<th>Claims Management</th>
<th>Finance, Payments and Accounting</th>
<th>Regulatory and Compliance</th>
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Questions? Comments?

*The Institutes’ white paper is available for free:*
http://www.theinstitutes.org/blockchain

**Contact:**
Email: Schmid@theinstitutes.org
Twitter: @PatrickG_Schmid