2018 Predictive Analytics Symposium

Session 06: ALL - Blockchain: Why It's Important, and Why Now

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2019 PREDICTIVE ANALYTICS SYMPOSIUM

Blockchain: Why It's Important and Why Now

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SOCIETY OF ACTUARIES®

Blockchain. Important. Now.

- Blockchain: It is important, and it is important to you, now.
- Anyone mention blockchain this week?
- Anyone have practical experience yet?
- Why would you bother?
- Other questions…?

It's the future of data, and how it's trusted for a purpose.

Sound Actuary-ish?

The What, Why and How

Blockchain data networks will be critical to actuaries, and Actuaries are critical to blockchain networks.

- Actuaries ensure:
  - Aligned to clear Purpose
  - Define the Rules
  - Verify performance
  - Support change
- Ideas and networks need your attention **now**
  - The industry is experimenting
  - Prototypes have a way of becoming reality
- In the next hour – Blockchain:
  - what it is, why it matters
  - Tech maturity, current activity
  - Some things you can do

The Who. Not that Who. Us.

- About Us
- Our first blockchain “lightbulb”

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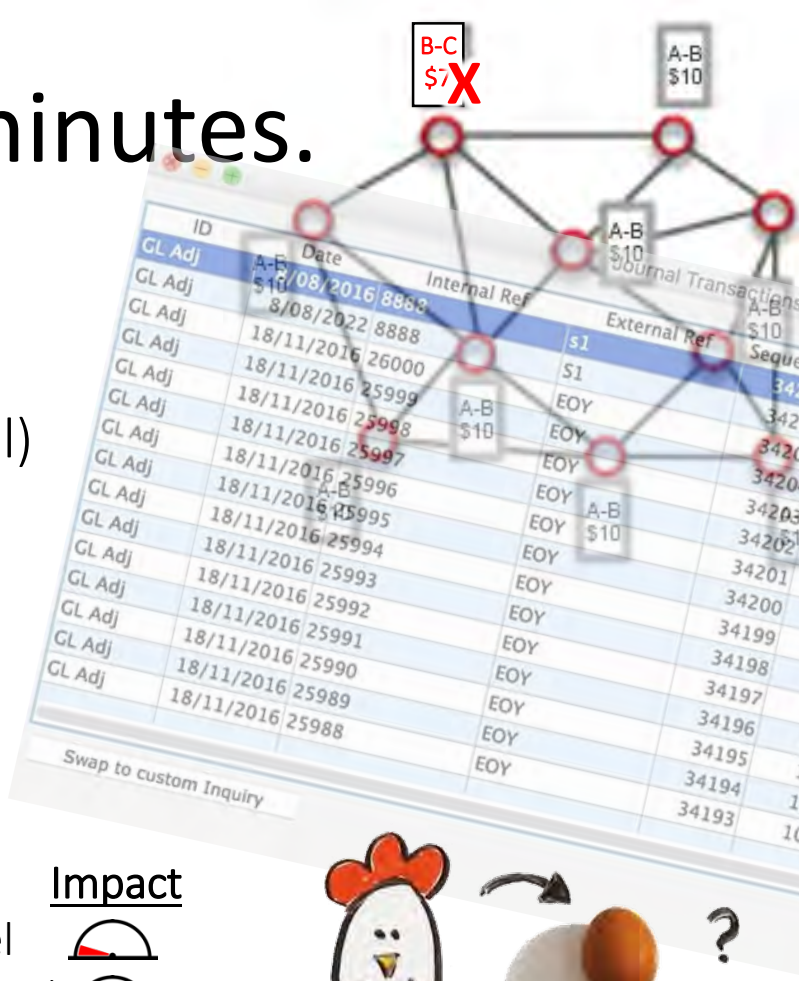
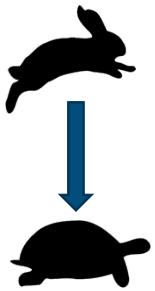
Blockchain 101 - in 5 minutes.

- Key Definitions:
  - Distributed Ledger and Blockchain
  - Smart Contracts (logical vs technical)
  - Hashes and “off chain” information
- Consensus and Community:
  - Public, Permissioned, Private
  - Government and Governance



Speed

EVOLUTION



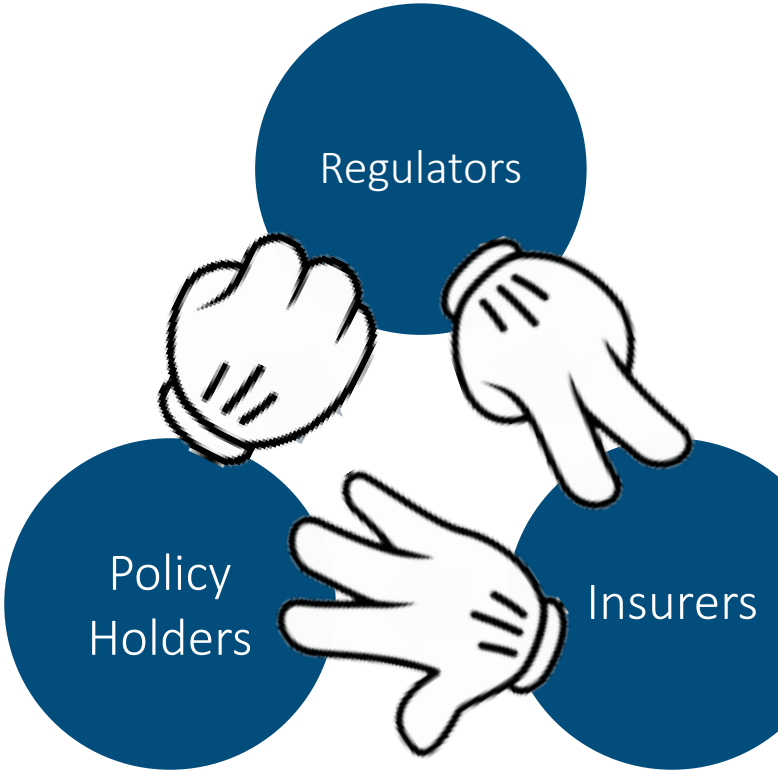
	Impact
Single Company/Pilot Model	
Founder Network (of **Partners**)	
Cross-Industry Network	
Competitor Network	
Policyholder Network	

Smart Contract Types

- A legal smart contract is a legal agreement expressed solely in code that automatically deploys and enforces self-executing promises.
- A hybrid legal smart contract is a legal agreement expressed in code that automatically deploys and enforces self-executing promises together with incorporated external judicial as a failsafe.
- A partial legal smart contract is expressed both in code and natural language where subjectively agreed upon terms such as “reasonable time” or “industry standard” or other types of promise qualifiers not easily defined by an if-the statement.
- A non-legal smart contract is an action expressed in code that is not a legal agreement. These types of Smart Contracts tend to be ministerial such as directing actions upon certain being met. (calculations, sending notices, etc.)

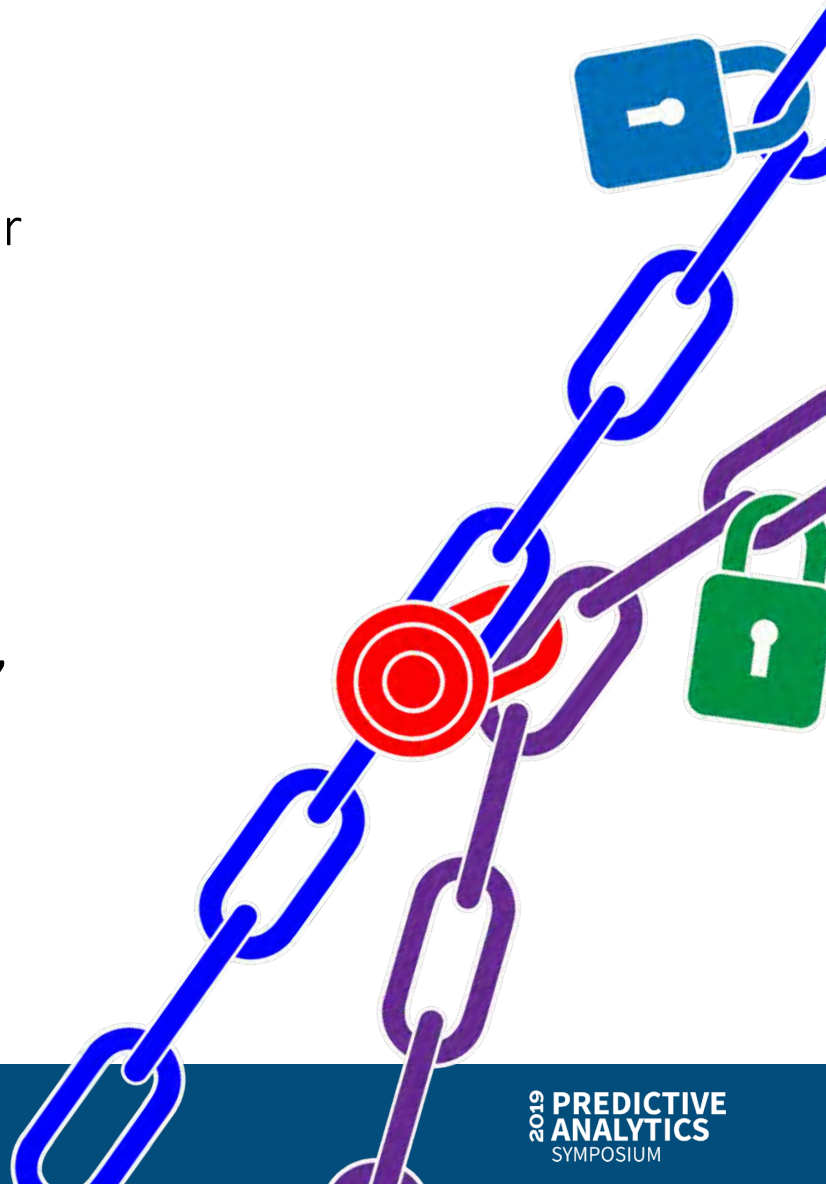
What is Blockchain Technology From a Business Point of View?

- Blockchain is a foundational technology.
- Ability for diverse parties to cooperate in an environment in which trust is brought about through the use of computer-based consensus mechanisms.
- These tools allow for a new way of digital value transfer – “currency”.
- Re-examine relationships to deliver greatly enhanced value based on trusted information and performance – not parties.
- The industry is actively experimenting and actuaries are the key resource in the equation.



Promises & Technical Problems

- ”Distributed Ledger”
  - Peers see the same data
  - Peers carry the weight of the other
  - Consensus rules and performance
- “Immutable Ledger”
  - GDPR – right to be forgotten
  - Long-tail liabilities (file retention)
  - Operational weight
- “Trust in a Trustless Transaction”
  - Aka “*Disintermediation*”
  - Who sets/changes the rules?
  - Objective enforcement
  - Transparent operation



More Legal, Operational Reality…

- IP ownership
- Open Source cooperation
- Regulatory impact
- Cybersecurity questions
- Governance
  - groups working together to act as a network
  - technology itself: consensus, code and protocols
- Adoption & back office integration
- Antitrust
- Enforcing Emerging Smart Contracts

Who are the Players (pushers)?

- Insurance Consortia such as RiskStream (formerly RiskBlock) and B3i
- Technical Consortia such as Hyperledger, Ethereum Enterprise Alliance, R3/Corda and Quorum
- Industry (vertical) consortia, MOBI, Food Trust, Insurwave
- Regulated intermediaries such as AAIS, brokers
- Regulators
- Technology Companies
  - IBM, Microsoft, Consensys, Oracle, Cisco, SAP, Facebook, Amazon, R3, etc.
- Individual Founders (Allianz, AIG, Nationwide…)
- Partnerships (State Farm/USAA)
- Consultants: accounting, auditing, legal…
- Few “data” companies as yet – need trust.

State of the Technology: The News

- Bakkt through ICE (Intercontinental Exchange) will launch the first bitcoin futures contracts that will be physically settled on September 23.
  - Microsoft and Starbucks are a part of this venture.
  - Bakkt's goal is to create the backbone for digital payment infrastructure for retailers.
  - Bitcoin futures contracts have existed since 2017 through CME, but they differ as they settle in cash.
- Exciting because for the first time regulators are coming together with a stalwart financial services industry player to work with cryptocurrency from a custody and integrity perspective.
- Enables humans to more easily trade in, and by implication, gather information on behavior and digital assets.
- This development has implications for microcurrencies and systems currencies: for instance-self-driving cars that may transact with each other.

State of the Technology: Maturity

- "Blockchains" today:
  - *Interrelated Ledgers*
  - *support complex transactions*
  - *enterprise use cases*
  - *private/permissioned networks*
- Solved (and supported):
  - Data security/isolation
  - Privacy/GDPR
  - Off-Chain Storage
  - Sovereign Identity
  - Network Ops/DevOps
  - Scalability & Performance
  - Platform interoperability

A lot is happening!

Technologies Aligning
Academia Teaching
Consortia Focusing
Competitors Partnering
Industries Investing
Regulators Learning
Legal Understanding

Blockchain will support your data

- Ownership
  - Data Owners retain explicit control
  - Interaction doesn't require sharing
- Access
  - APIs, Human Interfaces
  - Trusted Authorities and Peers
- Action
  - Automated, "white box/black box"
  - Trusted Logic and Performance
- Accountability
  - Performance to quality commitment
  - Objective, immediate enforcement

Actuarial Use Cases

- Potential to access data in a more timely and trusted manner. For example: MetLife Asia Death Registry and Life Insurance Claims. https://www.forbes.com/sites/stevenehrlich/2019/06/19/metlife-plans-to-disrupt-2-7-trillion-life-insurance-industry-using-ethereum-blockchain/#
- In the face of death of a family member, filing a life insurance claim may not be a priority, and in some cases the family may not even know of the existence of the life insurance policy.
- MetLife's Singapore-based incubator LumenLab is collaborating with Singapore Press Holdings and NTUC Income to create a platform that, uses published obituaries, deploys smart contracts to discover if the deceased is protected with a policy, and if so, automatically file a claim.
- First life insurance pilot to streamline and bring efficiency and transparency to the claims process. Uses the live public Ethereum blockchain to add transparency and efficiency to the claims process.

Blockchain Promises that Excite the Insurance Industry

- New ways to access and scale real-time insights
- Automated decisions through Smart Contracts
- Creation of new products and new communities which can also become new marketplaces
- Innovation can be achieved across previously distrusting parties in a vertical or across verticals to create maximum efficient and trusted business process infrastructure
- Stakeholders can now become aligned in new ways and relationships can be codified (regulators, agents, brokers, advisories, customers, etc.)

How Can the Asia Example Occur in the USA?

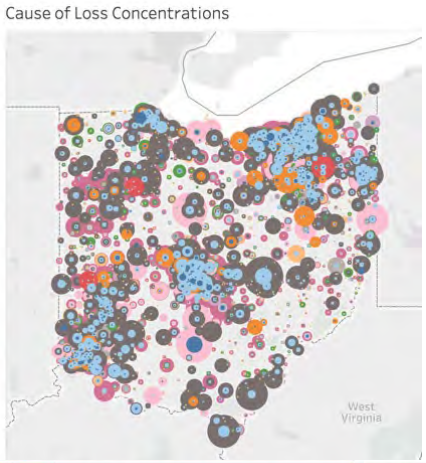
- Leverage the science – Actuaries write smart contracts. The logic by which data interacts with dollars, objects and processes.
- Blockchain processes can be used to streamline operations and reduce fraud while confirming convenient and quick turnaround for citizens and insurers in bereavement situations.
- Regulators need to be involved to create official death certificates.
- Insurers, long term care, and annuity providers have several assumptions built into the timing of the receipt of death information . Using blockchain technology, this timing can be streamlined. In many cases, more timely information can lead to more efficient use of capital.
- Insurers could use the blockchain to provide data on the probability of death and create a “decision tree” and smart contracts to pay out events before the electronic death certificate is issued.
- The potential exists to better link birth and death records to prevent fraud.
- The registry may be accomplished as a standalone process or through the use of existing Health Exchanges in states where there is only one or two health exchanges.

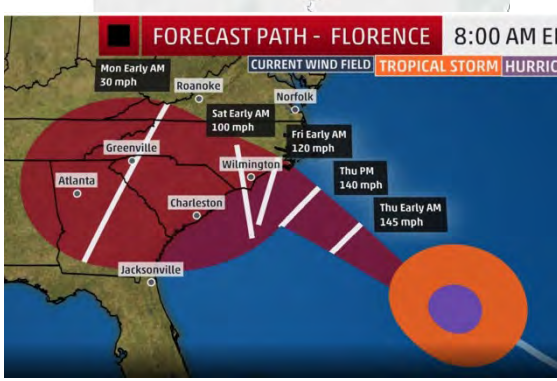
What Role Can Actuaries Play?

- The industry is actively experimenting with the technology. Its development can't be left to the technologists when it's a business system, and actuaries are the key resource in the equation.
- Actuaries will be creating the rules by which we understand and verify these autonomously-executing systems.
- Actuaries are foundational resources/category for assurance models (vs Insurance), defining not just expression of risk but how it works and the multitude of primary, secondary etc. factors work, that the logical structures (code) match the intended purpose and the language accurately represents that intent.

Future of Development

- Highly collaborative Product R&D
- Highly personalized/contextualized Products
- Products responsive to market experience
- ”Just enough” regulation and monitoring
- Lifestyle-Integrated services and features
- Value-focused:
  - ensuring risk needs are met
  - value is recognized, beyond paying claims.





Consortia view on Maintenance

- Consortia are creating technology systems as well as business solutions
- How is maintenance of the technology upheld, particularly if the consortium is not using open source technology?
- Need to address and provision for these issues in Consortium provisions and governance
- Need to address liability stemming from members failing to update their version of the software, yet still participate in the overall consortium software

Some New Efforts to Keep an Eye on

- Prediction Markets. One known decentralized protocol is Auger. https://www.augur.net/
- Augur is an open source, free, decentralized oracle and peer to peer protocol for prediction markets. Augur is composed of smart contracts that can be deployed to the Ethereum blockchain.
- Mutual alternative risk sharing platforms. One known platform is Nexus Mutual. https://www.nexusmutual.io/
- Nexus Mutual is a mutual company that creates smart contract cover to protect against hacks of use of smart contract code in an unintended manner. The mutual model aligns incentives through staking a certain amount of cryptocurrency. The company intends to offer traditional insurance products down the road.
- Decentralized Oracles. Most well known is https://chain.link/
- Smart contracts use third party data such as data feeds, events, payments, etc. to execute. The third party providers are called Oracles and can be centralized (the way we receive 3rd party data today) or decentralized through companies such as Chainlink.

What to Look For and Leverage

- Opportunities Abound
  - Very early phase – more to learn tomorrow
  - Clarity comes with basic knowledge
  - Open minds, good faith and empathy build foundations
- Look for:
  - Areas of “implicit trust”
  - Areas of substantial risk, critical exposure, shared pain
  - Key lifecycle/decision “activities” and factors
  - Objective, available sources of data
- Leverage:
  - Your domain knowledge, data and strengths
  - Relationships with key Stakeholders
  - Design thinking to collaborate on challenges
  - Experience of prior and concurrent efforts

Where Can I Go to Learn More?

- Events like this
- Blockchain and Insurance Industry Conferences
- Insurance and Technical Consortia
- Industry participants (all have easily available research and resources-much is at no-cost)
- Consultants
- Internet searches
- Certain academic literature: IC3 (Cornell), MIT, Stanford, etc.
- Certain Regulators