What Blockchain Means For Your Organization's Insurance Program

Bradley Arant Boult Cummings LLP

Presented by Katherine J. Henry

and Brendan W. Hogan

November 2, 2017

Agenda

- Understanding Blockchain
  - Defining Blockchain
  - Explaining Blockchain
  - Exploring Uses of Blockchain
- Insurance “on” the Blockchain
- Planning for Blockchain in Your Organization

Bradley

Understanding Blockchain

Defining Blockchain

- Decentralized, secure ledger
- Operated by “peer-to-peer” network of computers (“nodes”)
- Each node uses common rules to verify and accept entries or transactions
- Each node responsible for verifying transactions and storing ledger
- Once nodes reach consensus based on common rules, transaction added to common ledger
- Also called Distributed Ledger Technology (“DLT”)

Blockchain Framework

- “Blocks” (record of transactions) added in linear chronological order
- Ledger is shared because each node has full Blockchain, each “block” in linked to all prior “blocks,” forming a “chain”
- Shared record cannot be falsified by single entity
- Node is any computer connected to Blockchain and used to execute and verify transactions

Underlying Technology Behind Bitcoin

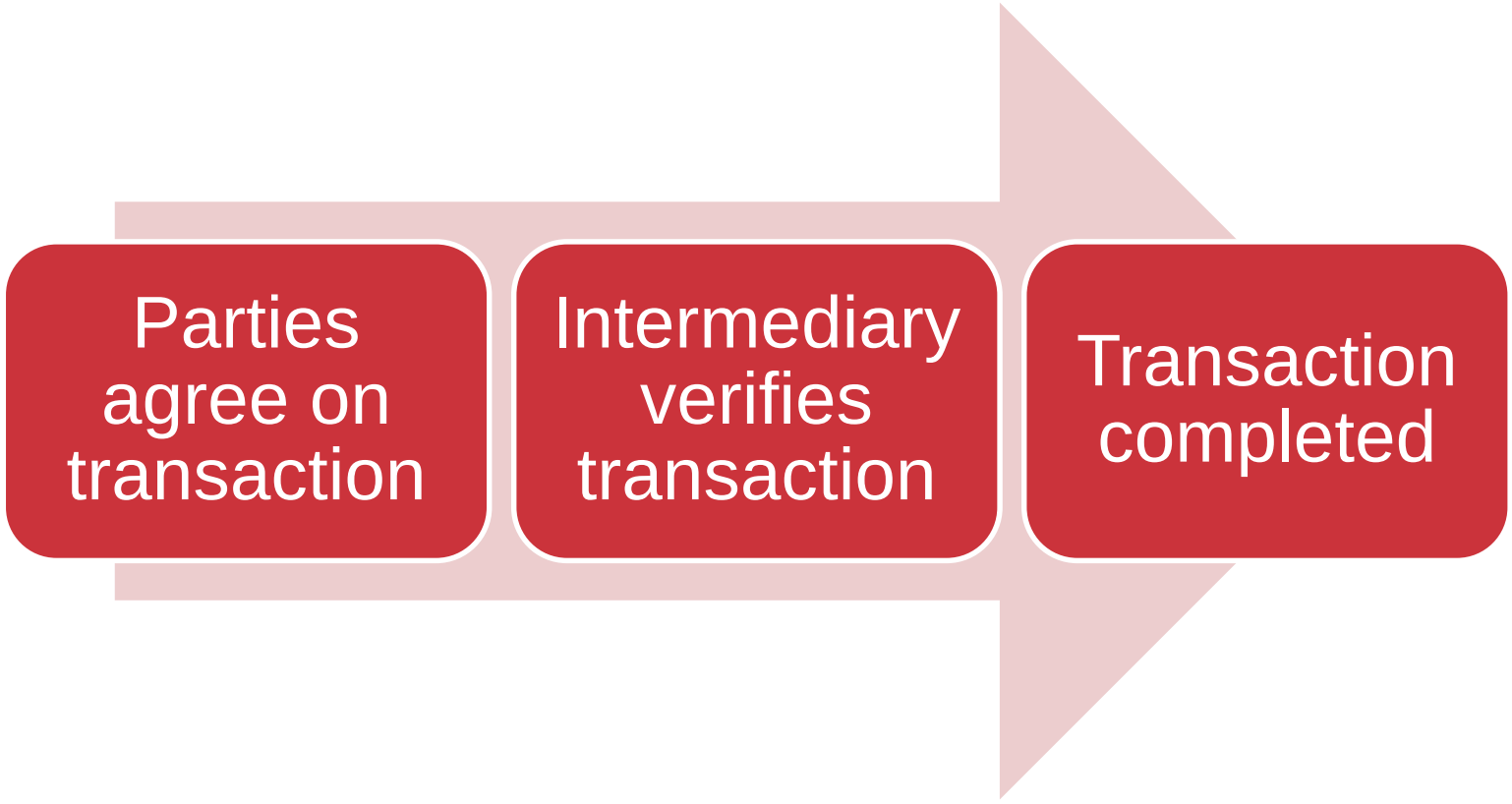
Bradley

You May Still Be Asking…

What is Blockchain and why should my organization care about it?

Bradley

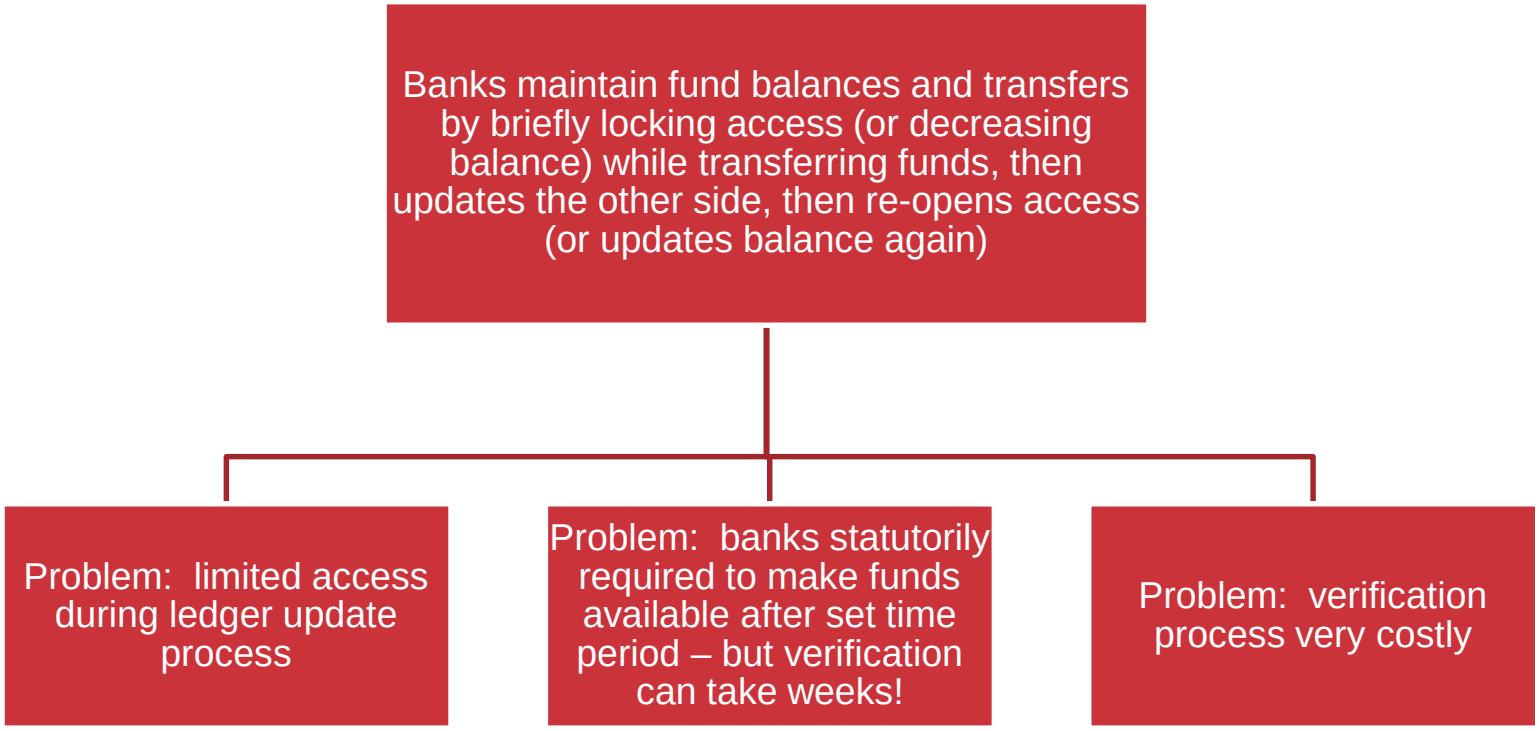
Current System



Current System Example – Bank Transfer

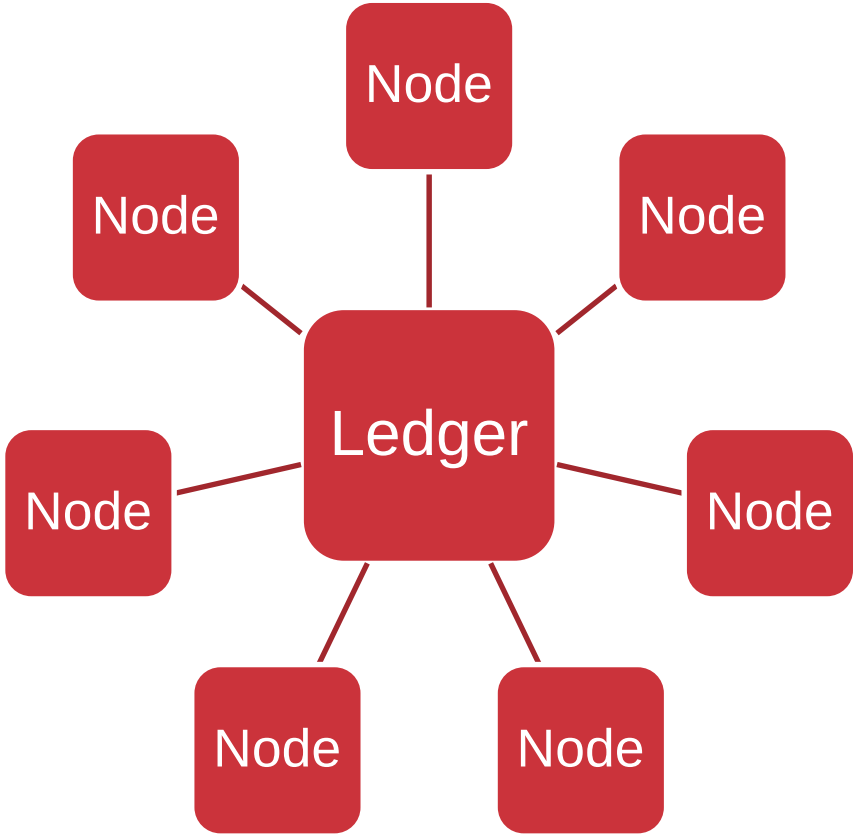
- Bank updates its user account balances when customer requests transfer of funds to another customer
- Requires tremendous (and costly) time and effort for coordination, synchronization, messaging, and confirming that each transaction happens exactly as it should
- Originator holds funds until recipient confirms receipt

Current System Example – Bank Transfer



Bradley

Explaining Blockchain



Bradley

Blockchain Is a Shared (Distributed) Ledger

- Traditional way of collaborating on document is to send document to another party to revise
- Traditional way precludes two parties from simultaneously updating same document
- With Blockchain, both parties can simultaneously access document and single version of document always visible to both parties
- “Distributed” just means sharing with a number of people

Blockchain Allows Trustless Verification of Entries

- Certain subsets of users verify transaction in exchange for benefit (transaction fee or mining reward)
- Verification requires investment of resources, ensuring accuracy of verification process
  - Proof-of-work (Bitcoin)
  - Proof-of-stake
  - Limited, trusted membership (not a true Blockchain)
  - Other proof concepts (Proof of activity, Proof of burn, Proof of capacity, Proof of elapsed time)

Proof-of-Work to Verify Transactions

- Proof-of-work requires “miners” to solve very complex mathematical problems before block added to chain
- Once problem is solved, easy to verify that solution is correct, so other nodes can verify answer is legitimate
- Difficulty and cost involved in creating block reduces incidence of fraud and malicious activity
- Cost of producing block paid by miners (who are rewarded by the protocol), not the users of the system

Problems with Proof-of-Work

- “Miners” have different incentives than non-miners, so systems with both users and miners creates inherent friction between their goals, which can lead to systemic instability
- Amount of energy required to validate transactions is substantial (by design), which can be “wasted energy” with negative environmental impact
- Time required to solve problem limits transaction speed (Bitcoin takes approximately ten minutes to verify transactions)

Proof-of-Stake to Verify Transactions

- No “miners” or complex cryptographic problems, instead users (“validators”) certify accuracy of transactions by comparing transaction to public record
- Validators required to own system currency
- Validates blocks by “staking” their own currency to certify validity
- Validator loses stake for malicious behavior or invalid action
- Validator rewarded with transaction fee

Proof-of-Stake Explained

- Imagine 100 people sitting around a circular table
- One person has a bundle of papers, each with a different transaction history
- Frst participant picks up a pen and signs one, then passes it onto next person, who makes a similar choice
- Each participant only gets $1 for signing transaction history that most participants sign
- Participant signing more than one piece of paper is punished

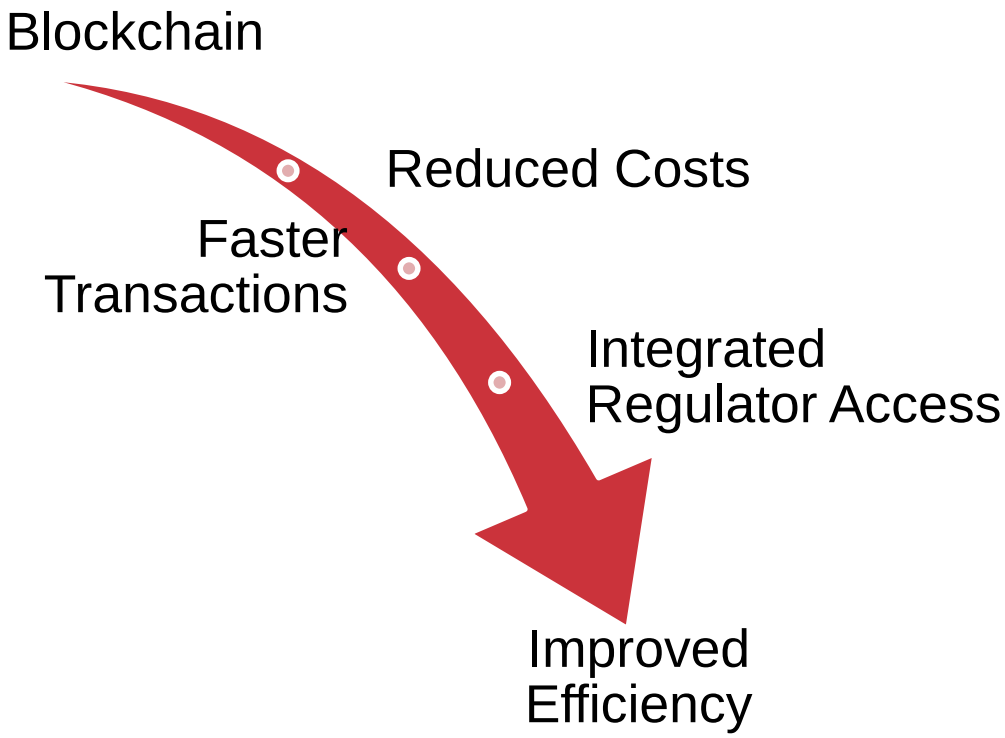
Bradley

Problems with Proof-of-Stake

- Potential for validators to collaborate to fraudulently "de-validate" transactions certified by competing validators
- Potential for validators to collaborate to falsely certify transactions for their own benefit
- "Nothing-at-stake" problem – without punishment for malicious actions, validators incentivized to double certify or certify non-correct chains because no consequence if certification fails

Bradley

Exploring Uses of Blockchain: Why Blockchain Matters



Bradley

Investment in Blockchain

- Substantial investments by institutional investors and established companies (IBM, Microsoft, AIG, Maersk, Intel, Google Venture, Samsung)
- Initial coin offerings (ICOs) or token sales increasing to approximately $2 billion this year from $256 million in 2016

Hyperledger Model

- IBM, Intel, Cisco, London Stock Exchange Group, JP Morgan, Wells Fargo, and others—teamed up to create Hyperledger
- Open source project inspired by Bitcoin that companies hope will one day provide more secure and reliable way of trading stocks and other assets”
- For example, IBM says that disputes over tax rates or incorrect shipments now take an average of 40 days to resolve. Hyperledger should streamline process

Ethereum Model

- Ethereum: purports to be “decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third party interference.”
- Smart contracts allow for more efficient execution of agreements when agreed upon conditions are met
- Other smart contract applications exist, but Ethereum best known

Replacement for SWIFT?

- Potential replacement for SWIFT messaging
- Nearly every bank currently uses SWIFT messaging to securely process transactions
- Distributed ledgers could settle accounts more quickly and save banks up to $20 billion a year

Blockchain and Internet of Things

- Connected devices can gather data and communicate information to each other, allowing automatic tracking of inputs to be cross referenced
- IBM believes Blockchain key to IoT's success:

  "Blockchain is the framework facilitating transaction processing and coordination among interacting devices. Each manages its own roles and behavior, resulting in an 'Internet of Decentralized, Autonomous Things' – and thus the democratization of the digital world"

Bradley

Blockchain Allows Easy Regulator Access

- Public or private Blockchains can easily be shared with regulators, governance committees, or other oversight organizations
- “Read-only” access allows oversight without risk of intervention
- Reduces compliance costs

Insurance “on” the Blockchain

Bradley

Insurers Are Exploring Blockchain Applications

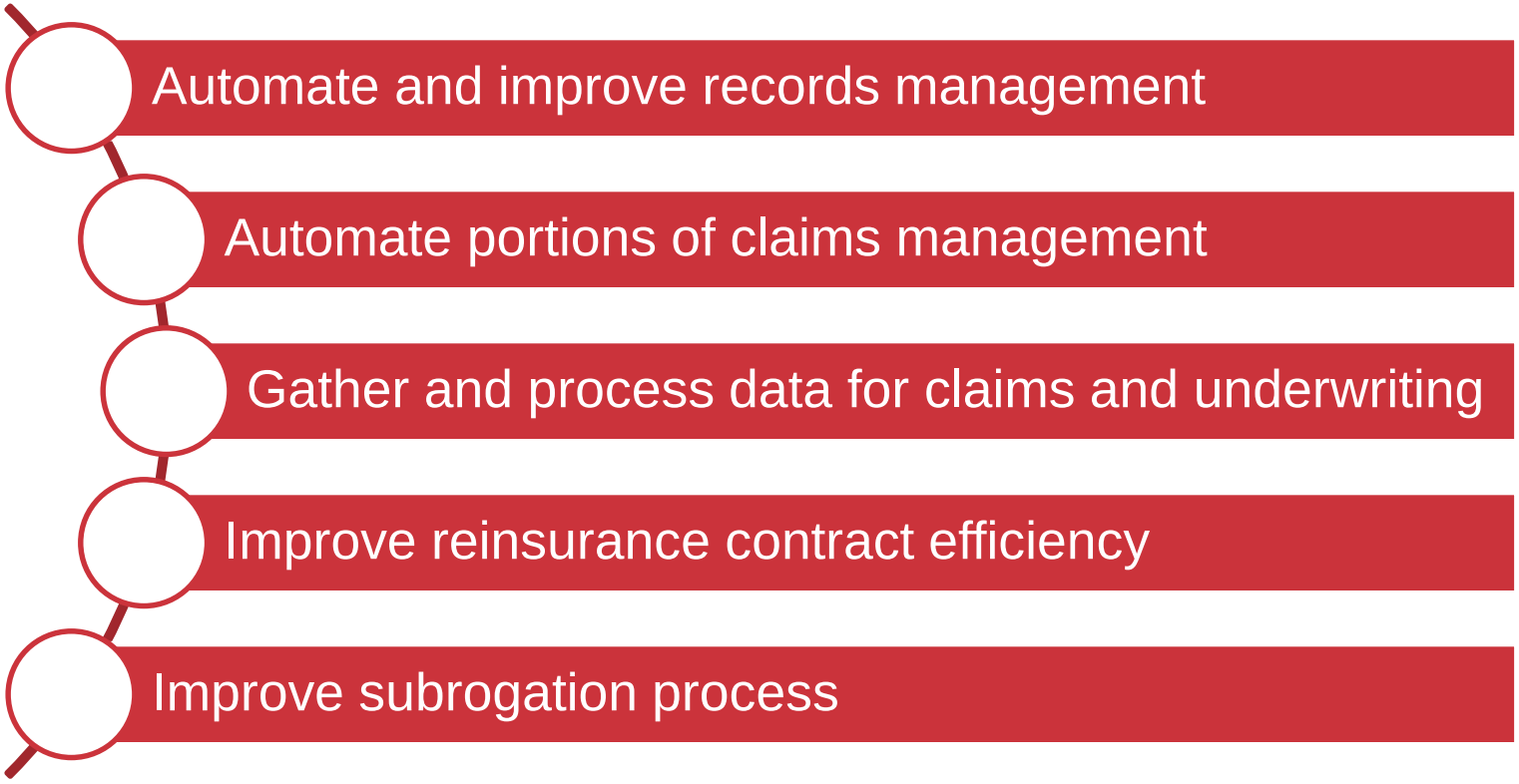
AIG announced a partnership with IBM and Standard Chartered Bank P.L.C. to test a “smart contract” insurance policy

Blockchain Insurance Industry Initiative, B3I, formed last year is testing Blockchain applications and launched a reinsurance prototype last month

Maersk, Microsoft, and Ernst & Young are working with insurers XL Catlin and MS Amlin on marine insurance Blockchain solution for logging information about shipments and potential risks

Bradley

Insurance Industry Focus



Bradley

Insurance Industry Benefits

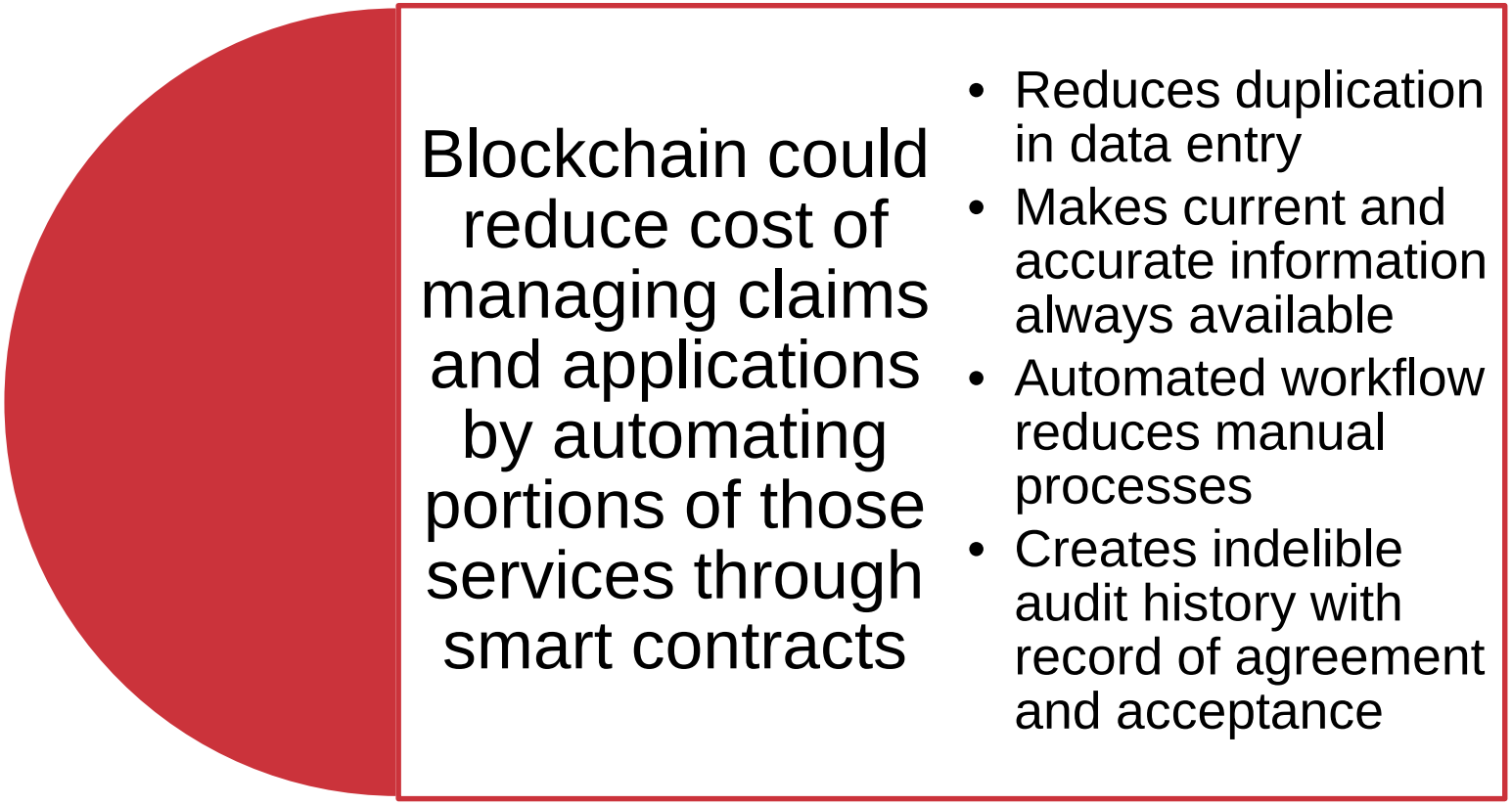
- Improve reinsurance efficiency
- Reduce claims management overhead
- Improve reserve calculation accuracy
- Improve underwriting accuracy
- Increase subrogation recoveries and reduce costs

Bradley

Smart Contracts in the Insurance Industry

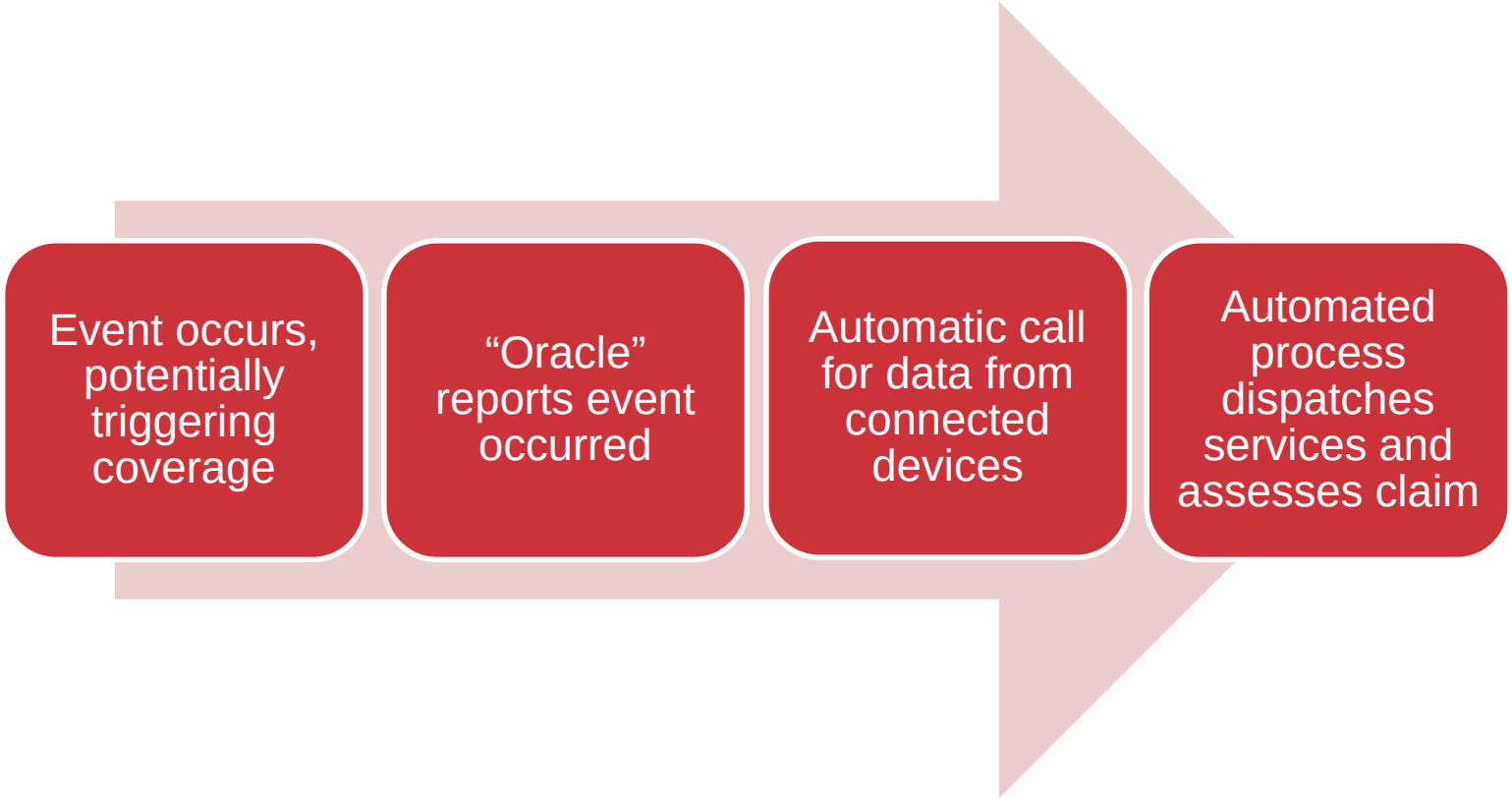
- “Smart contracts” are an application of Blockchain that integrate computer code into the Blockchain protocol, allowing certain functions to be securely automated
- Blockchain’s fraud reducing function allows automation with non-verified parties
- Integration of smart contracts, Blockchain, connected devices, and machine learning/artificial intelligence will power efficiency and efficacy gains we discussed

Records Management



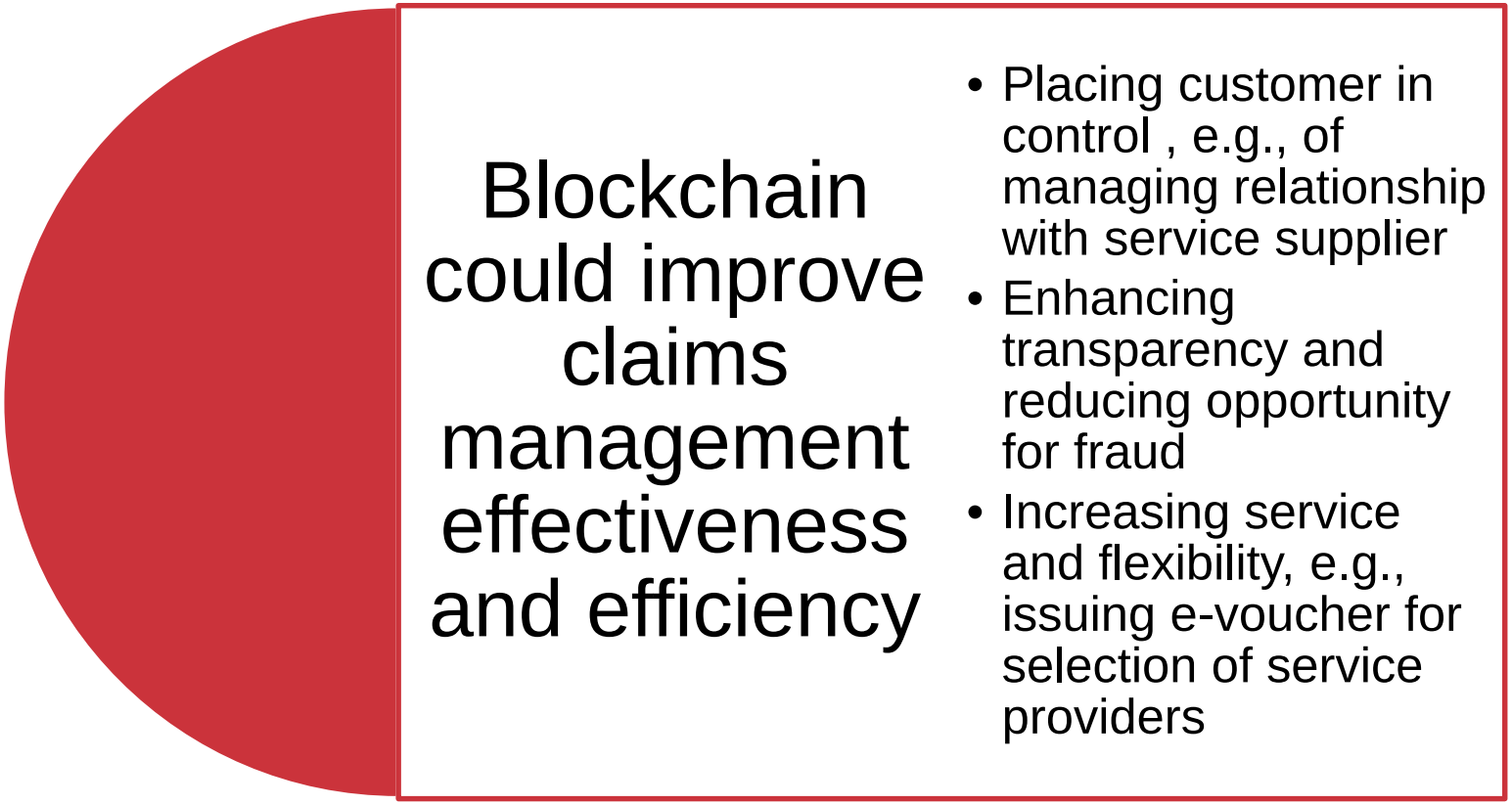
Bradley

Claims Automation



Bradley

Claims Automation

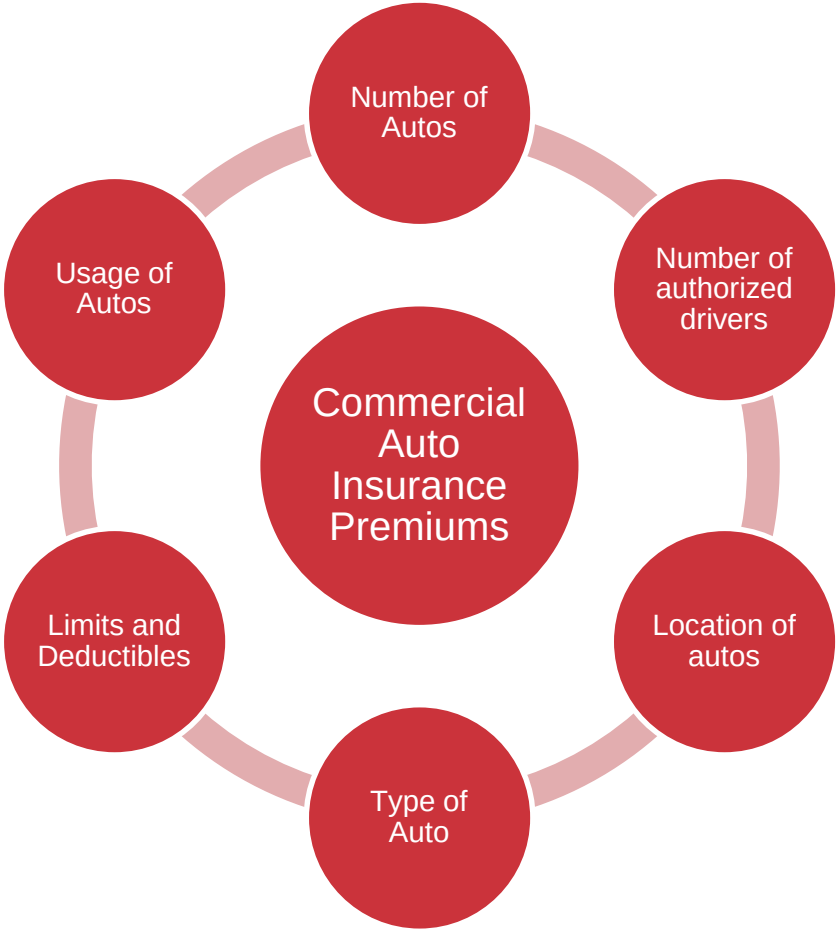


Bradley

Additional Data

- Adopting Blockchain applications could allow insurers to gather, store, and analyze policyholder data to a far greater degree than currently done in underwriting and reserve setting
- Development of Blockchain applications combined with proliferation of always-on, always-connected devices (Internet of Things or IoT) could substantially increase depth and scope of data that insurance companies obtain from policyholders

Additional Data – Example



Reinsurance

- PwC estimates cost savings for reinsurers exceed $5 billion
- Includes reducing processing time and cost of placement, reducing time to settle losses, and bringing more efficiency to compliance, such as sanctions or cyber-security
- PwC believes Blockchain technology may reduce claims leakage and fraud and so that resulting efficiency reduces 15 to 25% of current expenses

Reinsurance

- Smart contract could include entire reinsurance transaction on single ledger from original cession through each retrocessional assumption
- Entire process of placement, premium cession, loss cession, and payment simultaneously shared among all parties

Bradley

Subrogation

Blockchain allows insurers to jointly manage subrogation process and handle intercompany claims with benefits including:

- Enhanced efficiency and reduced costs through shared, distributed processing and data management
- Increased speed of settlement
- Increased process resilience

Bradley

Planning for Blockchain in Your Organization

Bradley

Policyholder Response

Blockchain's emergence poses both opportunity and risk for policyholders. Savvy policyholders should:

- Plan for potential claims automation
- Assess future value of source-level data for risk assessment
- Develop strategies for controlling access to risk assessment data to maximize coverage benefits
- Address inherent risk with smart contracts

Responding to Claims Automation

- Implementation of claims automation without proper policyholder controls in place could wrest critical decisions from policyholders:
  - Should we submit this claim given current business conditions?
  - How should we describe underlying event?
  - When did operative event actually occur?
  - Does an exclusion potentially bar coverage?
  - What role will brokers have in claims management going forward?

Responding to Data Management

- DLT applications allow insurers to more efficiently gather and store data for later use, but policyholders should control type and form of data shared with insurer before trading terabytes of data for promise of reduced premiums
- Sophisticated commercial policyholder might obtain lower premiums by using same devices, gathering and analyzing data, and reporting previously agreed-upon outputs to its insurer, rather than allowing insurer access to source-level data
- Policyholders should also consider broker's role in this framework

Smart Contract Risks

- While smart contracts do not require consumers to trust each other, but they do require them to trust code. "[I]f code is law, so are bugs in the code—and correcting them may itself mean a breach of contract"
- While smart contracts are expected to be unchanging and trustworthy, they still ultimately are created by humans who are capable of error
- On average, software comes with between 15 and 50 defects per 1,000 lines of code

Bradley

Blockchain Risk (Bitcoin Example)
Mt. Gox

- Bitcoin exchange (similar to stock exchange, allows currency to be traded for Bitcoin)
- Key here is that users don't own Bitcoin private keys (passwords required to access Bitcoin); users have right to receive Bitcoin when they request a withdrawal
- February 2014 Mt. Gox reported 850,000 Bitcoin missing
- Hacker gained access to Mt. Gox private keys fraudulently and transferred them to other accounts

Blockchain Risk (Ethereum Example)
DAO Hack

- Ethereum allowed developers to program not only smart contracts, but entire “Decentralized Autonomous Organizations” (DAOs)
- Entities do not need centralized management and operate beyond direct control of self-interested institutions such as governments.
- Ethereum coders immediately pressed ahead with just such an application and created a sort of venture-capital fund without venture capitalists, called DAO.

Blockchain Risk (Ethereum Example)
DAO Hack

- Everyone could join it by transferring digital coins (called “ether,” Ethereum’s equivalent of bitcoin) to a smart contract that represents fund, which gave them right to vote on investment proposals
- Attracted investment worth $150m, value of invested ether grew to $250m
- Unknown hacker exploited a “recursive call bug” to steal about $50m by withdrawing extra funds

Blockchain Does Not Eliminate Risk

- DAO and Mt. Gox examples illustrate key point: Blockchain does not eliminate possibility of fraud or malicious action
- Blockchain instead reduces risks of certain types of fraud so that transactions can be made without explicitly trusting counter party or using trusted intermediary

Summary

- Blockchain is decentralized, secure ledger that eliminates or reduces need for intermediary to provide trust and verification
- Blockchain has many potential applications
- Insurance industry exploring potential uses
- Potential cost savings for insurance industry likely will lead to adoption of Blockchain
- Policyholders should understand potential impact and prepare for disruption in insurance markets, claims handling, and policy administration

Bradley

Questions?

Katherine J. Henry
Khenry@Bradley.com
(202) 719-8244

Bradley