29th India Fellowship Seminar
2-June-2018

Blockchain in (Re)Insurance

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Institute of Actuaries of India

Agenda

- Overview of Blockchain
- How Blockchain works?
- Applications of Blockchain in (Re)Insurance
- Summary

OVERVIEW OF BLOCKCHAIN
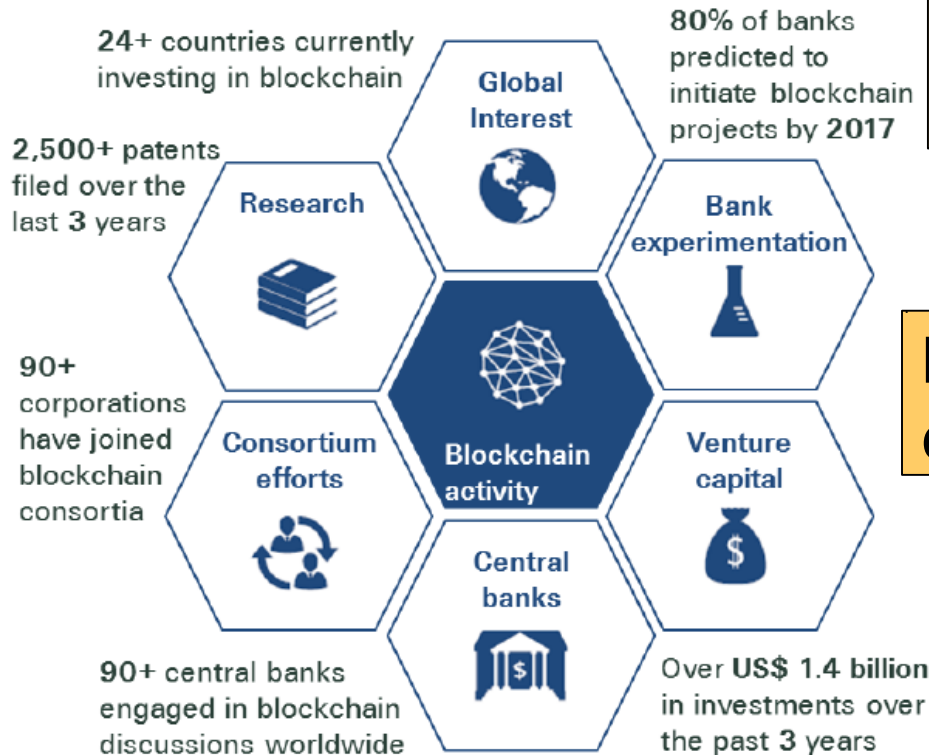
What is Blockchain?

- Blockchain is
  - A Type of Distributed Ledger
  - Incorruptible
  - Programmed to record anything of value

- Devised for Digital Currency Bitcoin

Blockchain is not same as Bitcoin

Just another Buzzword?

24+ countries currently investing in blockchain

2,500+ patents filed over the last 3 years

Research

Global Interest

80% of banks predicted to initiate blockchain projects by 2017

Bank experimentation

90+ corporations have joined blockchain consortia

Consortium efforts

Blockchain activity

Venture capital

Central banks

90+ central banks engaged in blockchain discussions worldwide

Over **US$ 1.4 billion** in investments over the past 3 years

Source: World Economic Forum

24+ Countries have invested

Many central banks engaged

$1.4bn+ investments

Blockchain is here and it is here to stay!

HOW BLOCKCHAIN WORKS
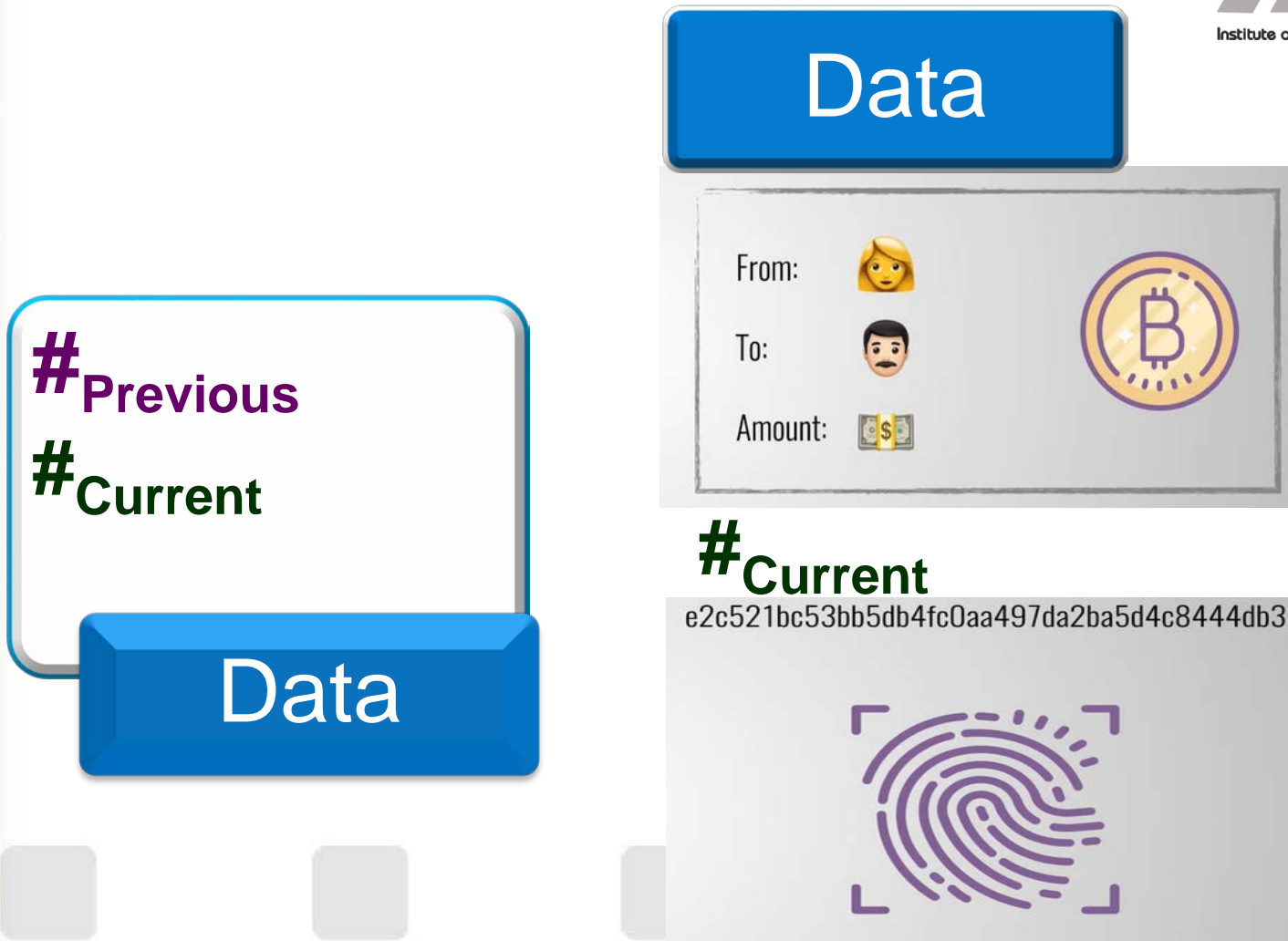
Why it is called Blockchain?
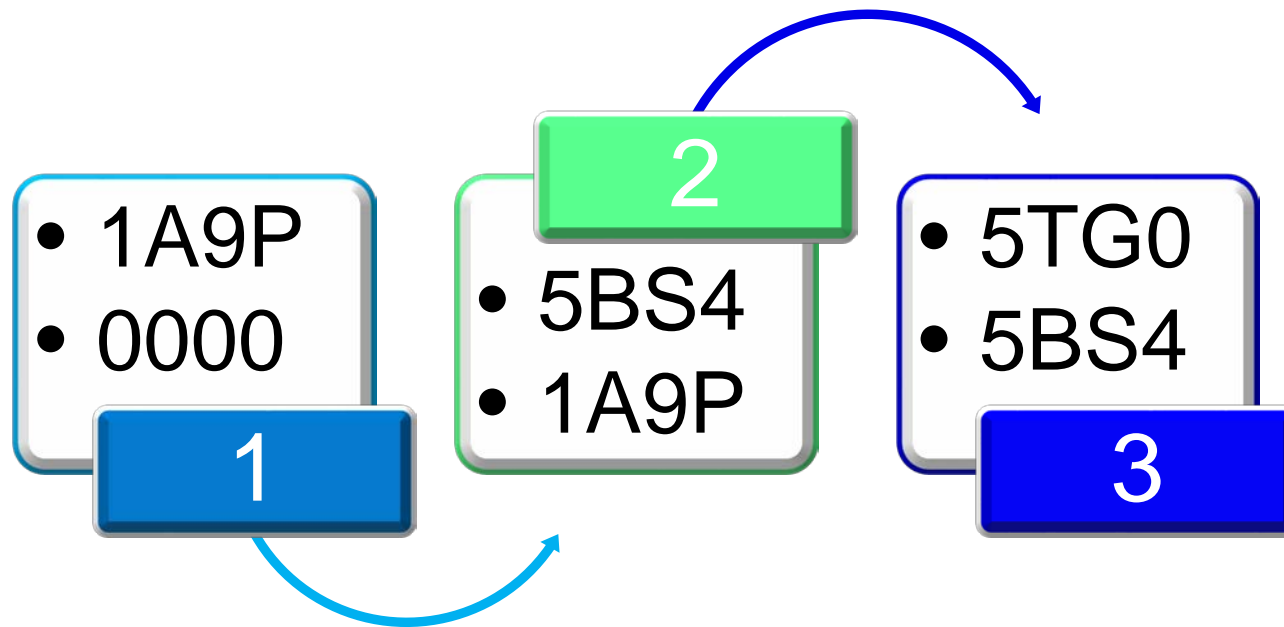
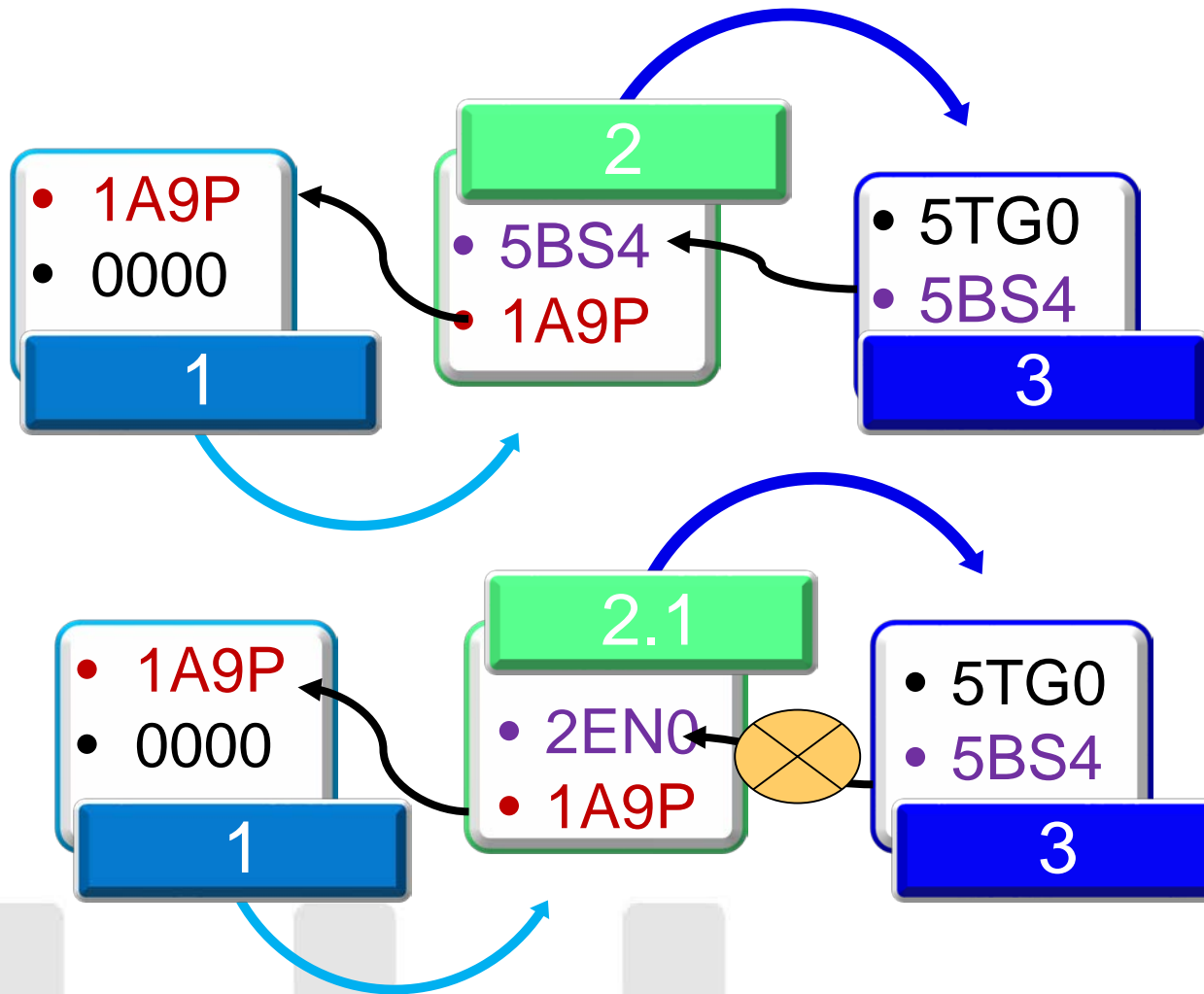Blocks are "chained" through #

What's inside a Block?

Data

#Previous
#Current

Data

From: 👩
To: 👨
Amount: 💵

#Current

e2c521bc53bb5db4fc0aa497da2ba5d4c8444db3
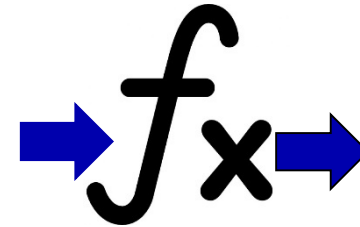
connects two blocks & is data dependent

Let me play with the data!
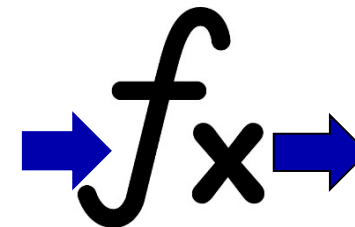

Tampering Data → Change in # → Link Breakage

IFS Example: Tampering Data

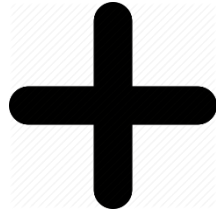| S2 | 1215-1300 | (Pradhan Mantri) Health Insurance Scheme- Understanding the product, potential, issues and impact on experience |

f_x → 5BS4

| S2 | 1215-1300 | (Narendra Modi) Health Insurance Scheme- Understanding the product, potential, issues and impact on experience |

f_x → 2EN0

Tampering Data → Change in # → Link Breakage

Adding a record : IFS Example

S4	1445-1530	Participating Funds - Most appropriate management & governance framework to ensure fairness to the policyholders and the global practice.

First miner to solve the "puzzle" gets rewarded

What does solving puzzle mean?

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S4	1445-1530	Participating Funds - Most appropriate management & governance framework to ensure fairness to the policyholders and the global practice.

0000000000000
0000000000000
000010110011111
000111101111000
0000111100

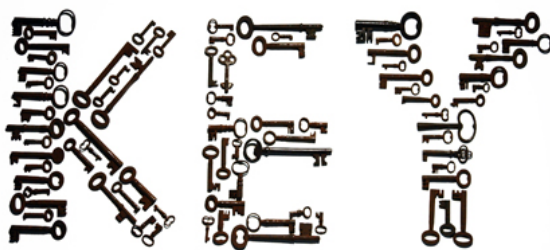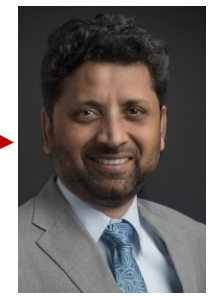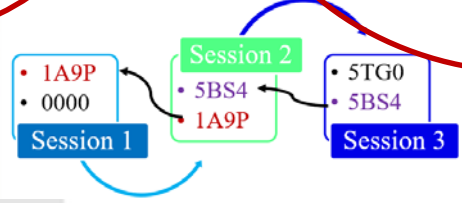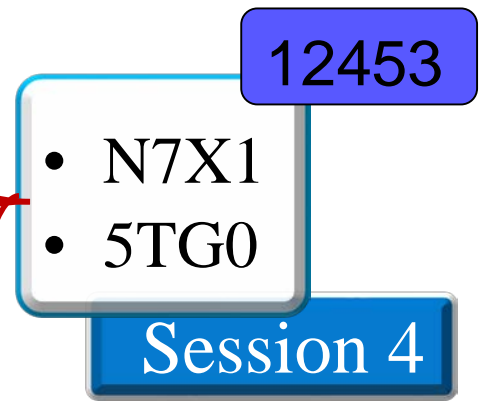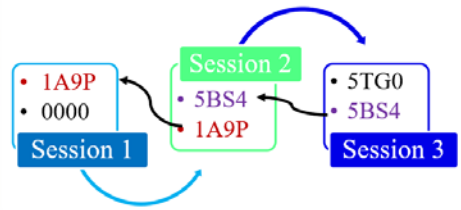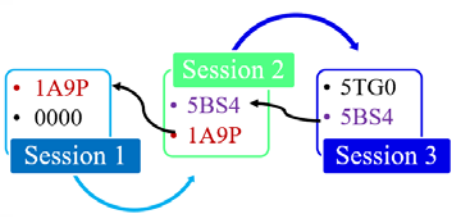| 12345 | 12354 | 12453 | 21345 | 45321 |

Randomly Generated Numbers
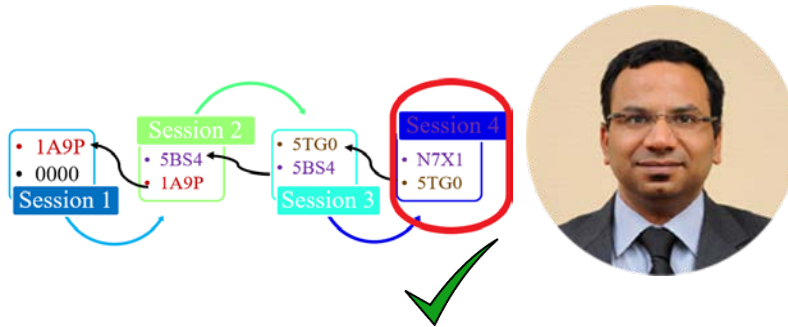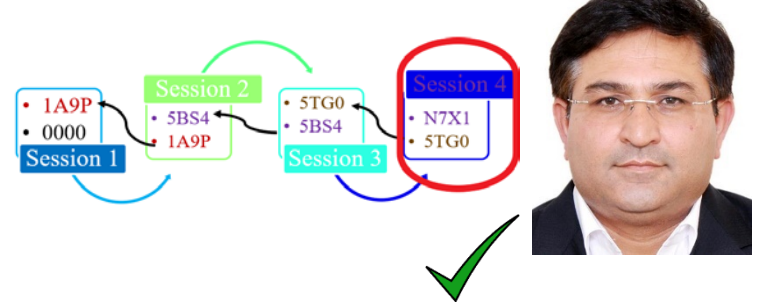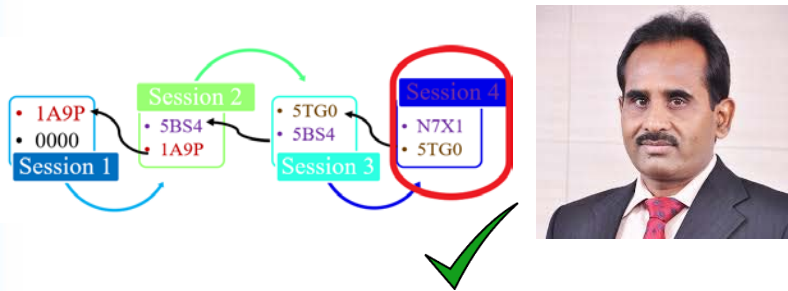
What does solving puzzle mean?

Solving the Puzzle = finding a key which opens the lock
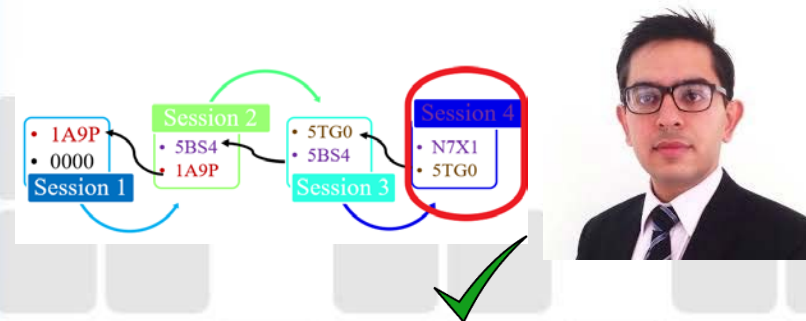
Once the key is found, it is easy to verify

Adding a record: Proof of Work

Adding a record: Consensus

Record is added in each copy after verification

Types of Distributed Ledger

Distributed Ledger Technology

"Blockchain"

PERMISSIONLESS, PUBLIC, SHARED SYSTEMS

PERMISSIONED, PUBLIC, SHARED SYSTEMS

PERMISSIONED, PRIVATE, SHARED SYSTEMS

DATABASES

Cross Stakeholder Decentralization
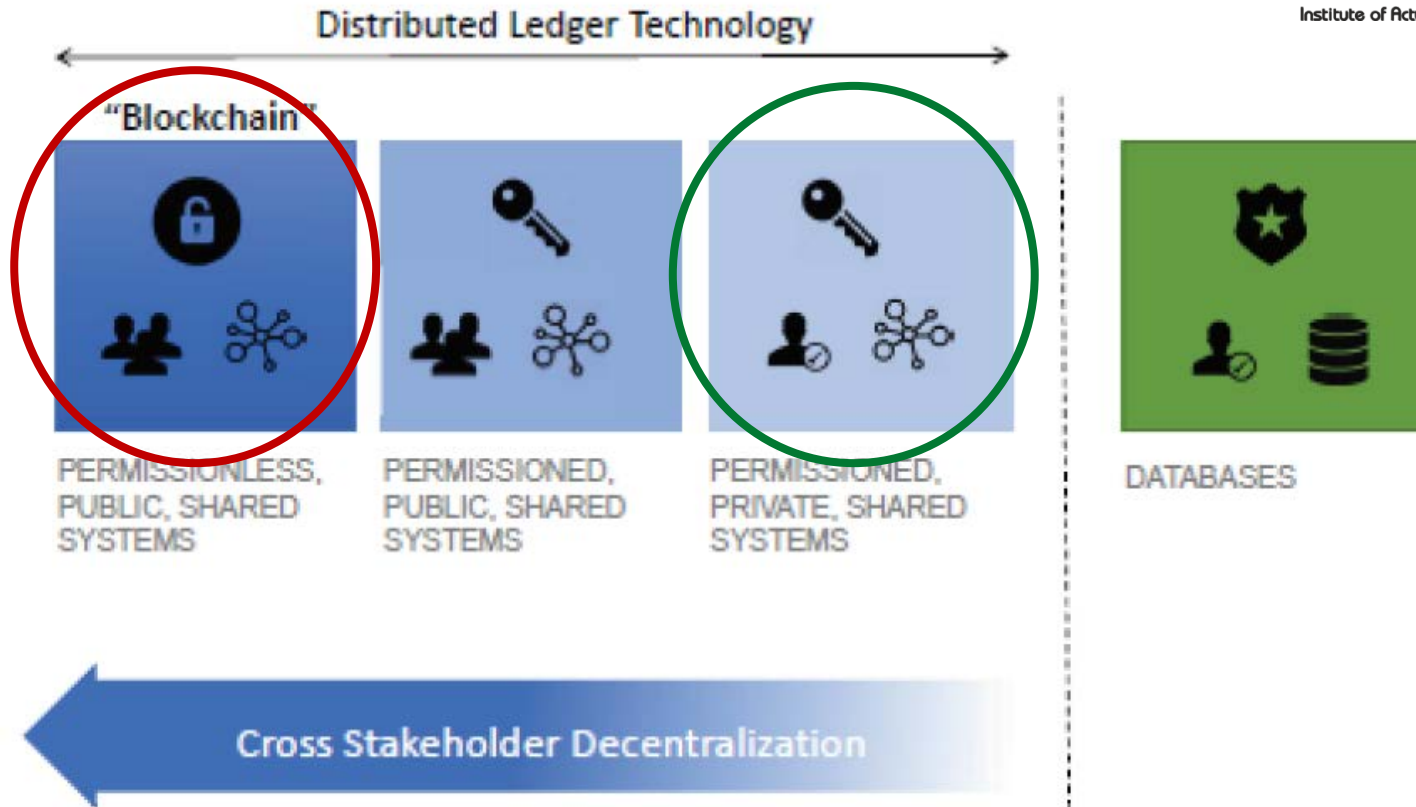
Source: Imperial College, London

Bitcoin uses Blockchain – Permissionless & Public
Most insurance applications – Permissioned & Private

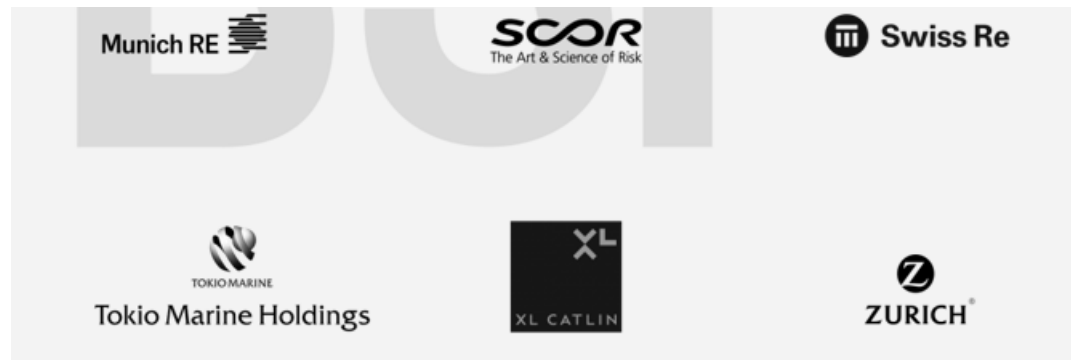# Insurance Blockchain Consortium

achmea   AEGON   ageas   Allianz

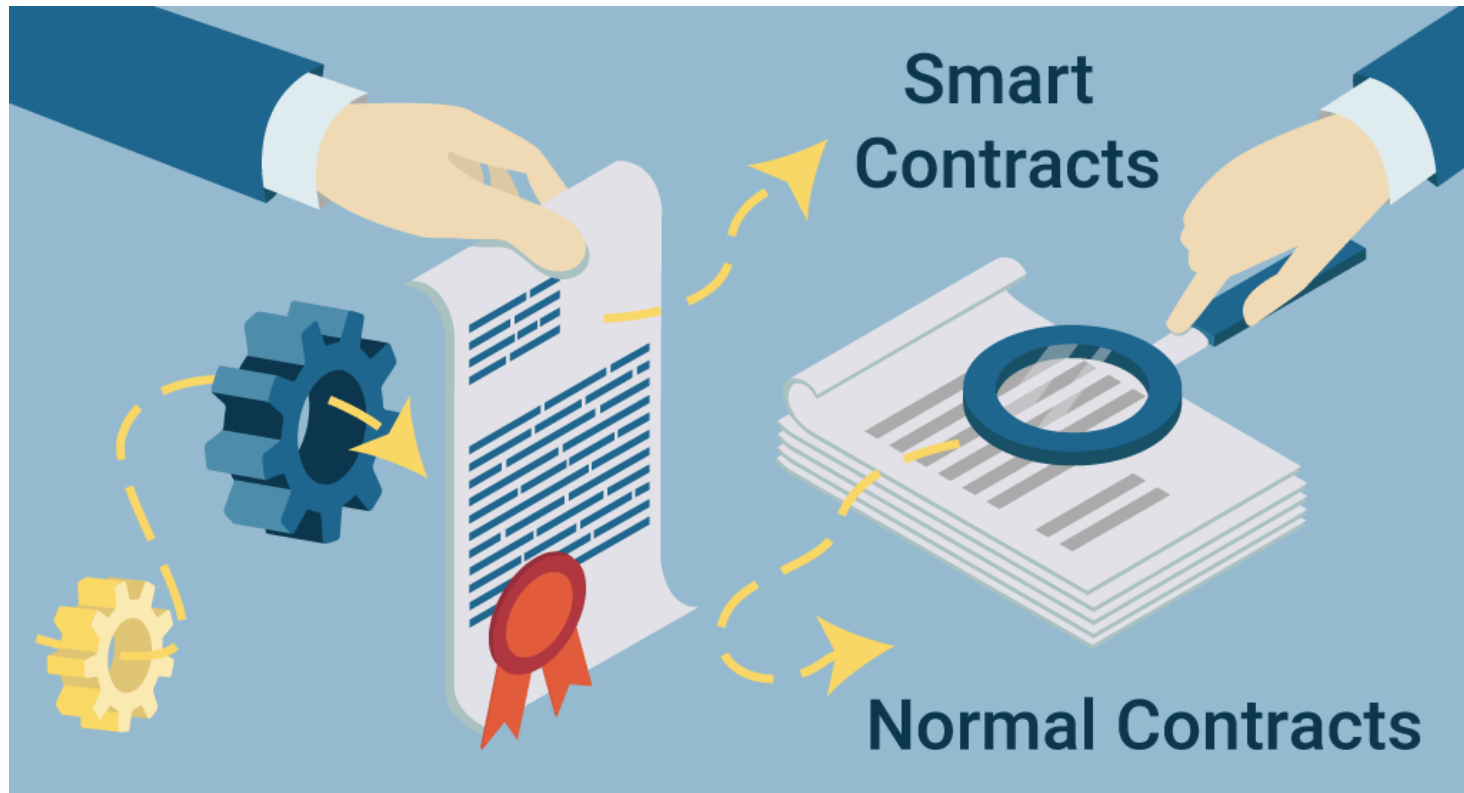GENERALI   hannover re   Liberty Mutual

Indian life insurers' consortium and Cognizant build industry-wide blockchain solution

They have developed a blockchain solution to facilitate cross-company data-sharing and will enable the insurers to reduce the risk of data breaches, fraud and money-laundering, while delivering superior experience to customers

Munich RE   SCOR The Art & Science of Risk   Swiss Re

TOKIO MARINE **Tokio Marine Holdings**   XL CATLIN   ZURICH

Consortium can be formed for Private Distributed Ledger

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Smart Contracts

Smart Contract = Digitized Normal Contract with tiny program stored in Blockchain

APPLICATIONS OF BLOCKCHAIN IN (RE)INSURANCE

Before jumping into bandwagon

|		
📖	**Shared repository**	**A shared repository** of information is used by multiple parties
👥	**Multiple writers**	**More than one entity** generates transactions that require modifications to the shared repository
🔑	**Minimal trust**	A level of **mistrust exists between entities** that generate transactions
⤳	**Intermediaries**	**One (or multiple) intermediary** or a central gatekeeper is present to enforce trust
🔗	**Transaction dependencies**	Interaction **or dependency between transactions** is created by different entities

Source: World Economic Forum
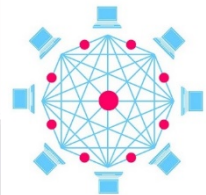
Parametric Health Insurance
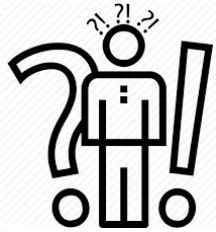
Friction in customer experience
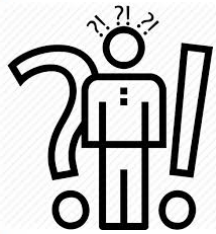
Complex Back Office Operations

VITANA

Gestational Diabetes cover for expecting mothers

No claims. Only pay-outs

Shared database between hospitals & Insurer

Smart Contracts – smooth & automated pay-out
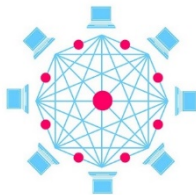
Tradable Life Insurance Policies

Lack of trust between buyers and sellers

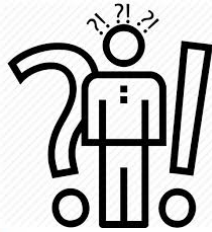Restricted in certain geographies

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Marketplace for trading of life insurance policies

Removes intermediaries & geographical boundaries

Deals with lack of trust through smart contracts

Commercial Insurance Platform

Physical marketplace results in inefficiency

Location constraint limits potential option of insurers

Blockchain based marketplace for connecting brokers and insurers

Shared repository breaks geographical boundaries

Smart contracts reduce paperwork and data duplication

Pay-As-You-Go Motor Insurance

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Fraudulent Claims on accident

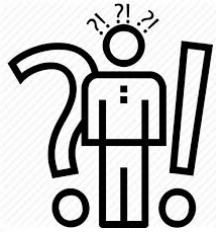Expensive claims underwriting before disbursement

GO 2 SOLUTION

Claims disbursed within 15 minutes of request

Claim cost automatically calculated

Blockchain creates fingerprint of each damage

Smart contract disburses money automatically based upon claim amount calculated
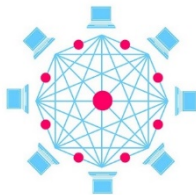
Personalised Home Insurance

Under-insurance in the home market
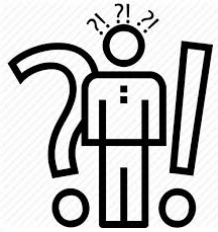
Lengthy and complicated application

Intelligent and Personalised home insurance

Dynamic cover – increases when new items bought

Build a secure, digital inventory of home contents

Shared ledger – can be updated by insurer & insured
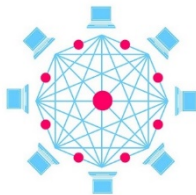
Peer-to-Peer Insurance

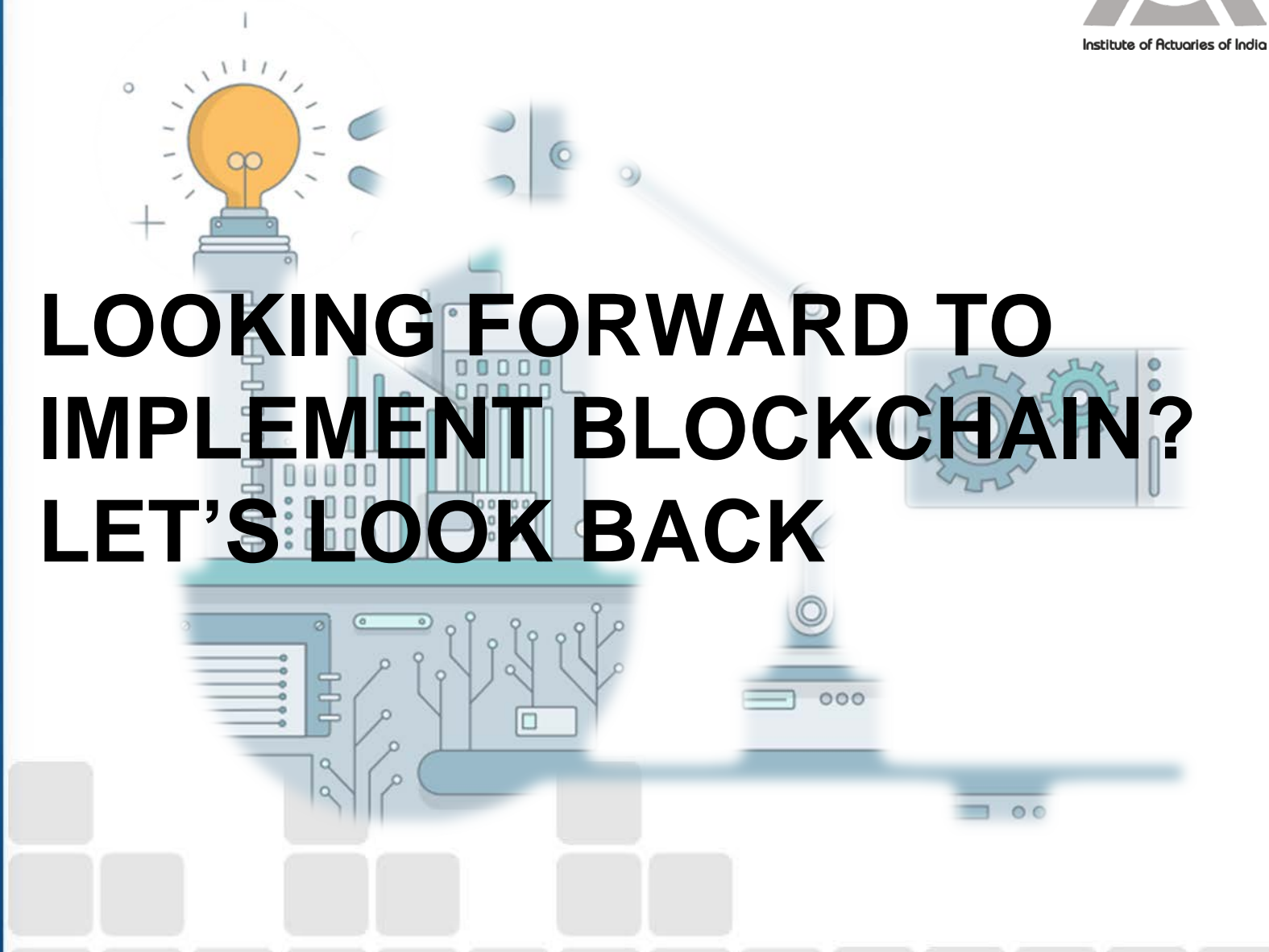Hassle to getting claims from Insurance companies

teambrella

Peer-to-Peer Insurance

Claims based on voting of peers

Blockchain makes the process transparent

Transfer of money is done without central authority

LOOKING FORWARD TO IMPLEMENT BLOCKCHAIN? LET'S LOOK BACK

Summary

- Blockchain is not Bitcoin
- Blockchain
  - A shared database
  - Can be updated by anyone with permission
  - Tamper Proof
- Private Blockchain help controlling "the access"
- Smart contracts are tiny programs in Blockchain
- Blockchain is not just a buzzword –solves real life problems

Thank you

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