

Problems and Opportunities for Bitcoin and Blockchain Technologies in the Insurance Industry

Daniel R. Robles, PE, MIB

The Ingenesist Project and Coengineers, PLLC

Seattle, WA



*National Society of
Professional Engineers
Fintech Task Force*

INGENESIST
INGENESIST



COMMUNITY ENGINEERING
SERVICES, PLLC

Our Story Begins Here



Enterprise Data Systems

Corporations
Banks
Insurance
Government
Institutions
Schools
Hospitals
Banks



CRMS
Financial
Product
Employee
Distribution
Legal
Strategy

Alice's Enterprises



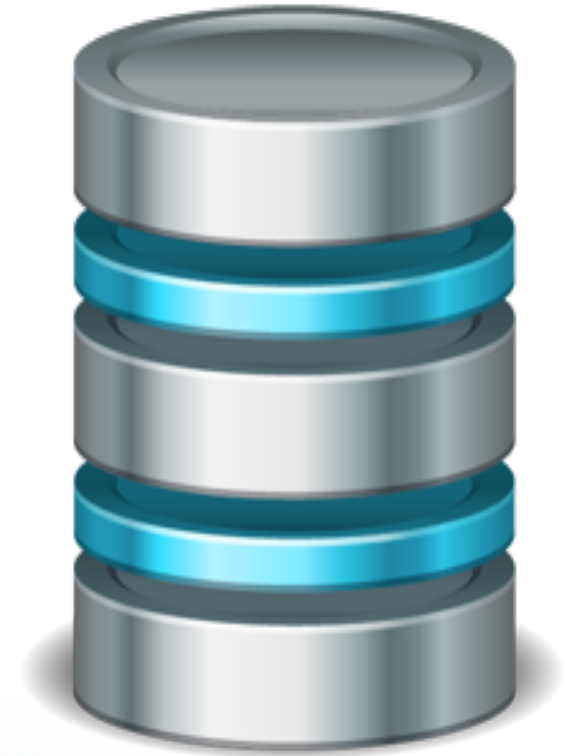
Bob's Business



Alice's Enterprises



Bob's Business



Centralization: Combine Databases

Mergers
Acquisitions
Partnerships
Efficiency
Market Cap



Monopoly
Oligarchy
Obfuscation
Too Big to Fail
Control

Decentralization:

Everyone shares the same database

No:

Controls
Security
Authority
Consensus



YES:

Faster
Cheaper
Easier
Fairer

ALSO: Lying, Cheating, Stealing

This is the problem that Blockchain Solves

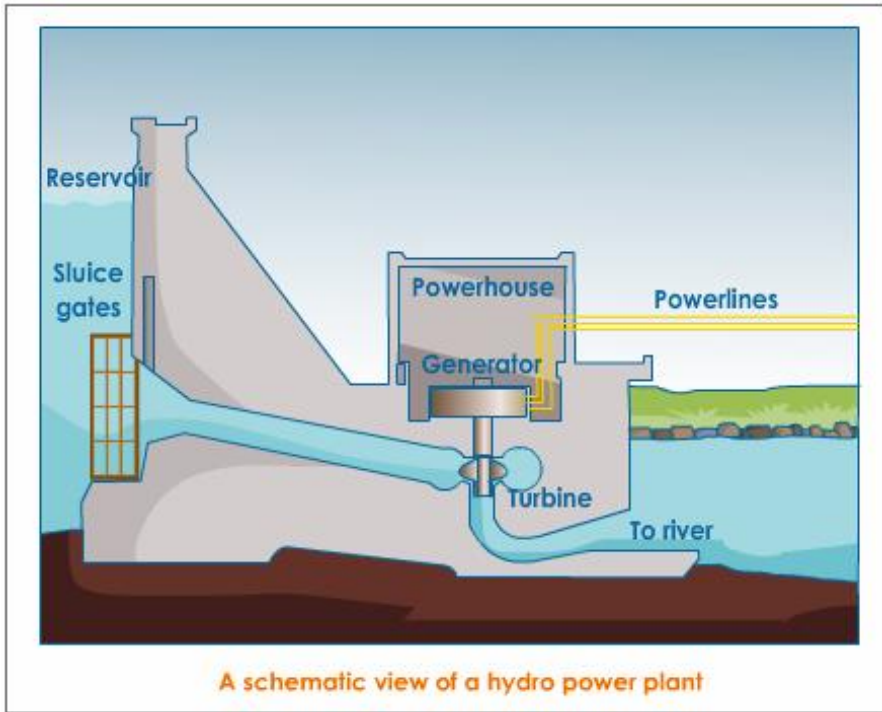
Let's summarize the problems and opportunities that lay before us:

- How different to insure a decentralized business?
- Isn't the insurance industry a huge database?
- If you take the human out, What regulations needed? What's not, What's interfering?
- Finally, how do real world interaction change?

Engineers are Risk Managers

1. Can I identify the risk exposure?
2. What is the probability that the peril will get me?
3. If it does get me, what are the consequences?

Blockchain Is Like A Utility



Bitcoin



bitcoin



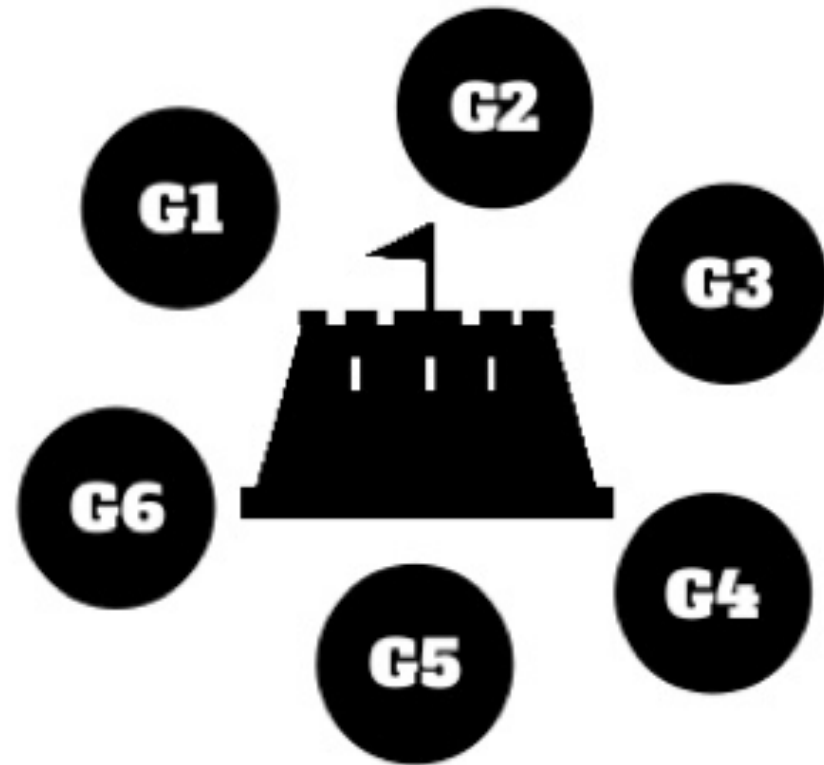
Killer App

Software as a Utility?

Bitcoin is a 3-Trick Pony

1. The Byzantine General's Dilemma
2. The Secret Handshake
3. The Time Keeper

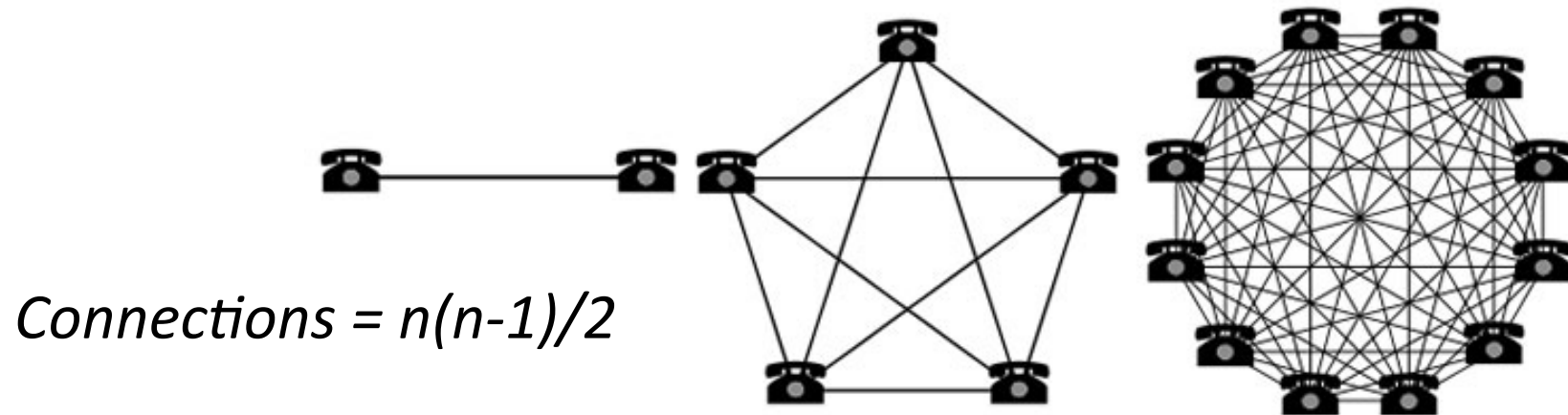
1st Trick: The Byzantine General's Dilemma



1. Vote on the vote
2. Metcalff's law; value of the network is proportional to square of the nodes
3. Rules: 100% consensus otherwise retreat

Comparing this to our three questions:

1. Yes, we can identify the risk exposure
2. Yes, we can calculate the probability of failure
3. Yes, we know the consequences of failure

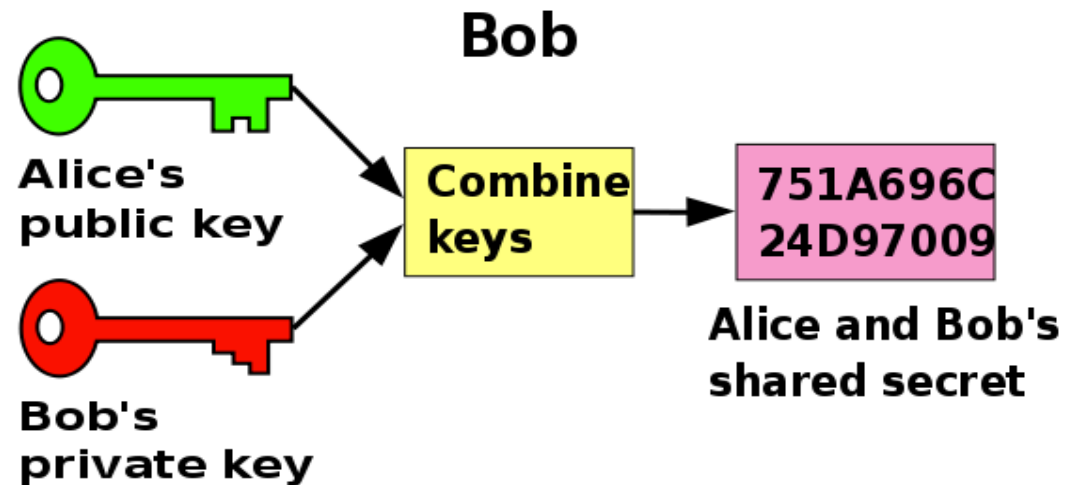
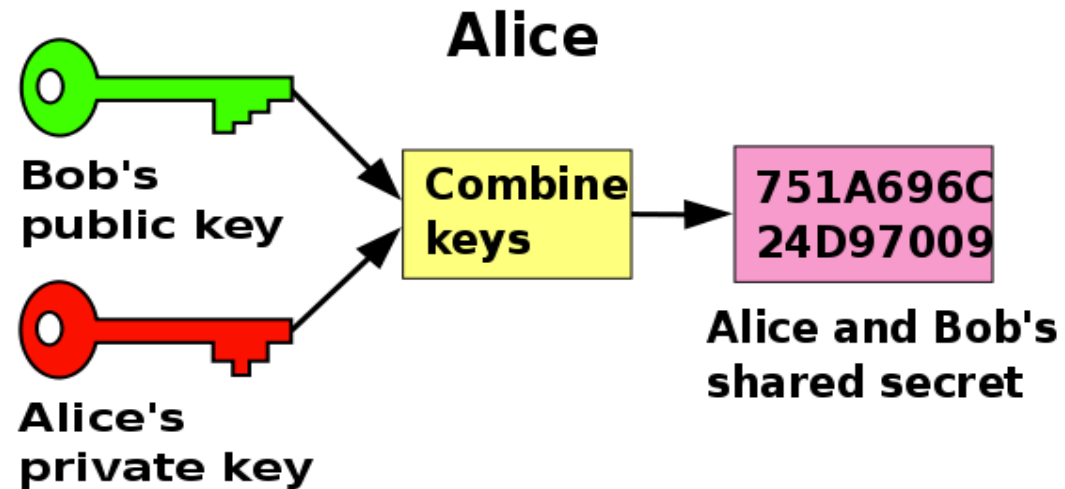


Yes, the first trick is insurable, so far so good!!



Byzantine Fault Tolerant Systems

2nd Trick: The Secret Handshake (multi-key Cryptography)



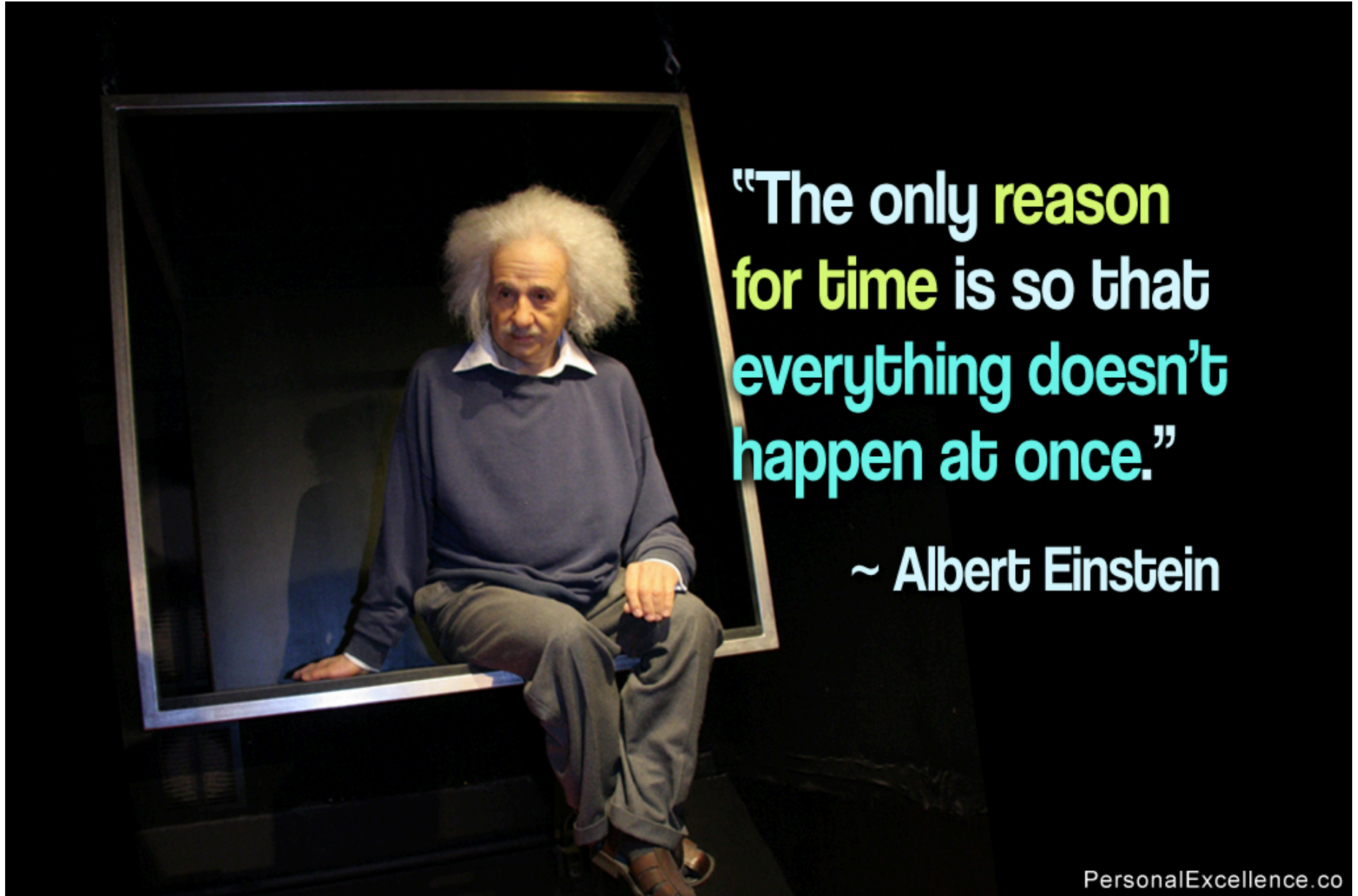
Comparing this to our three questions:

1. Yes, we can see the risk exposure
2. Yes, we can calculate the probability of failure
3. Yes, the consequences of failure can be determined.

$$\textit{Probability of failure} = (\textit{possible answers})^n$$

Therefore, trick #2 is also insurable.
Things are looking up!

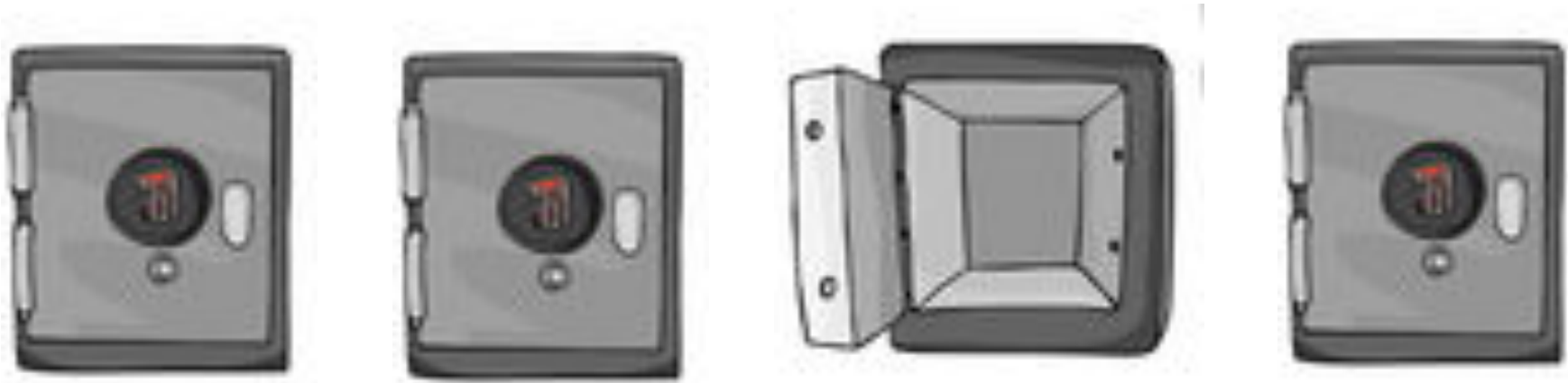
3rd Trick: The Time Keeper



"The only **reason**
for time is so that
everything doesn't
happen at once."

~ Albert Einstein

Consider an Infinite Series of Bank Vaults



RULES

1. Combination for each vault stored in the prior vault
2. Each combination can only be used once
3. No two vaults can be open at the same time.

Here is Where the Coin Comes In



Comparing this to our three questions:

1. Yes, we can see the risk exposure
2. Yes, we can calculate the probability of failure
3. Yes, the consequences of failure can be determined.

Therefore, trick #3 is also insurable.

Wow, this is one Clever Pony!!

...Well, actually this is where the
problems start...

What exactly are bitcoins?

Are they money?

Are they property?

According to Uniform Commercial Code, Title 9, The Definition Of Money:

*"**Money**" means a medium of exchange currently authorized or adopted by a domestic or foreign government".*

RM questions:

- No, Bitcoin is not money
- What's the probability that gov't will decentralize monetary policy?
- What are the consequences if they did?

Is it Property?

Assumptions:

- Discreet units or made of inseperable parts
- Title to the property travels with the property
- Transactions are traceable

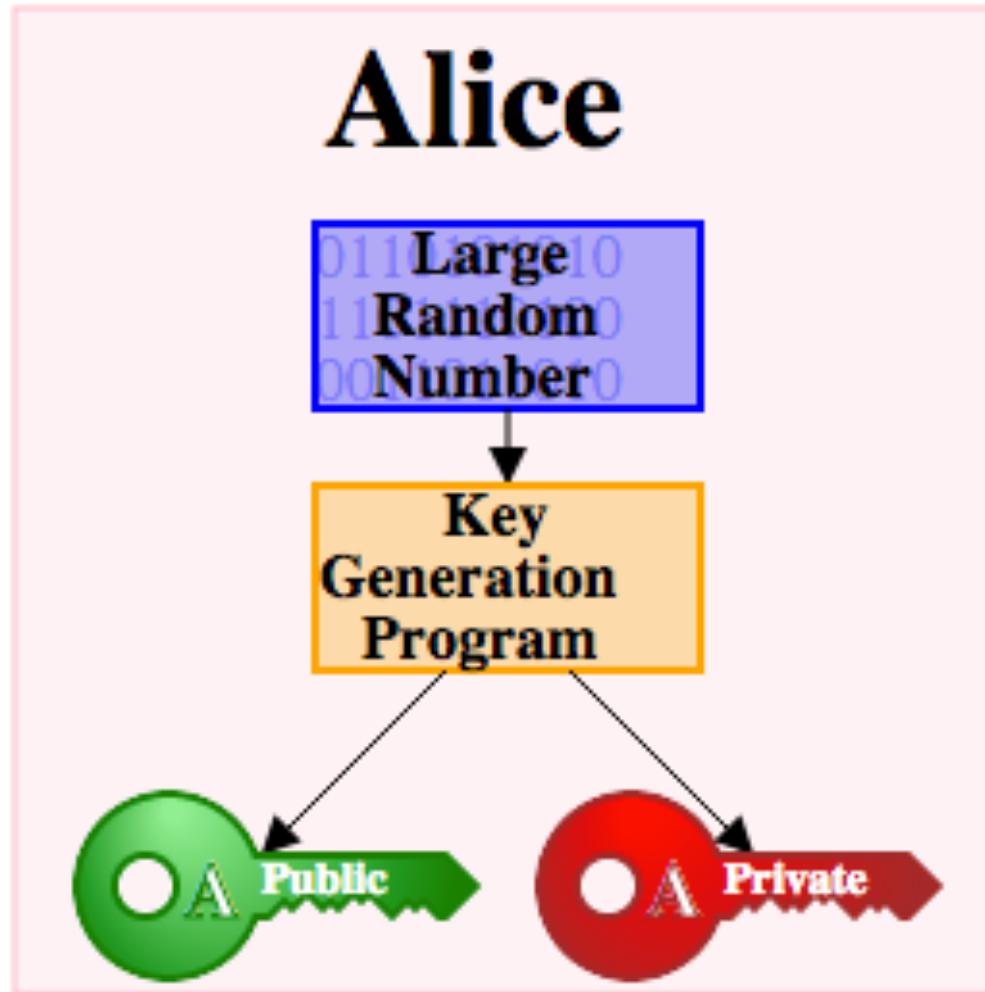
Actually:

- Bitcoin divisible into many parts
- Title to bitcoin does not travel with bitcoin
- Bitcoin are anonymous

Let's take a look at where we are

Insurable?	
Byzantine Fault Tolerant	✓
Multi-key Cryptography	✓
Blockchain Engine	✓
Bitcoin as Money	X
Bitcoin as Property	X

Hold Keys as Proxy for Property

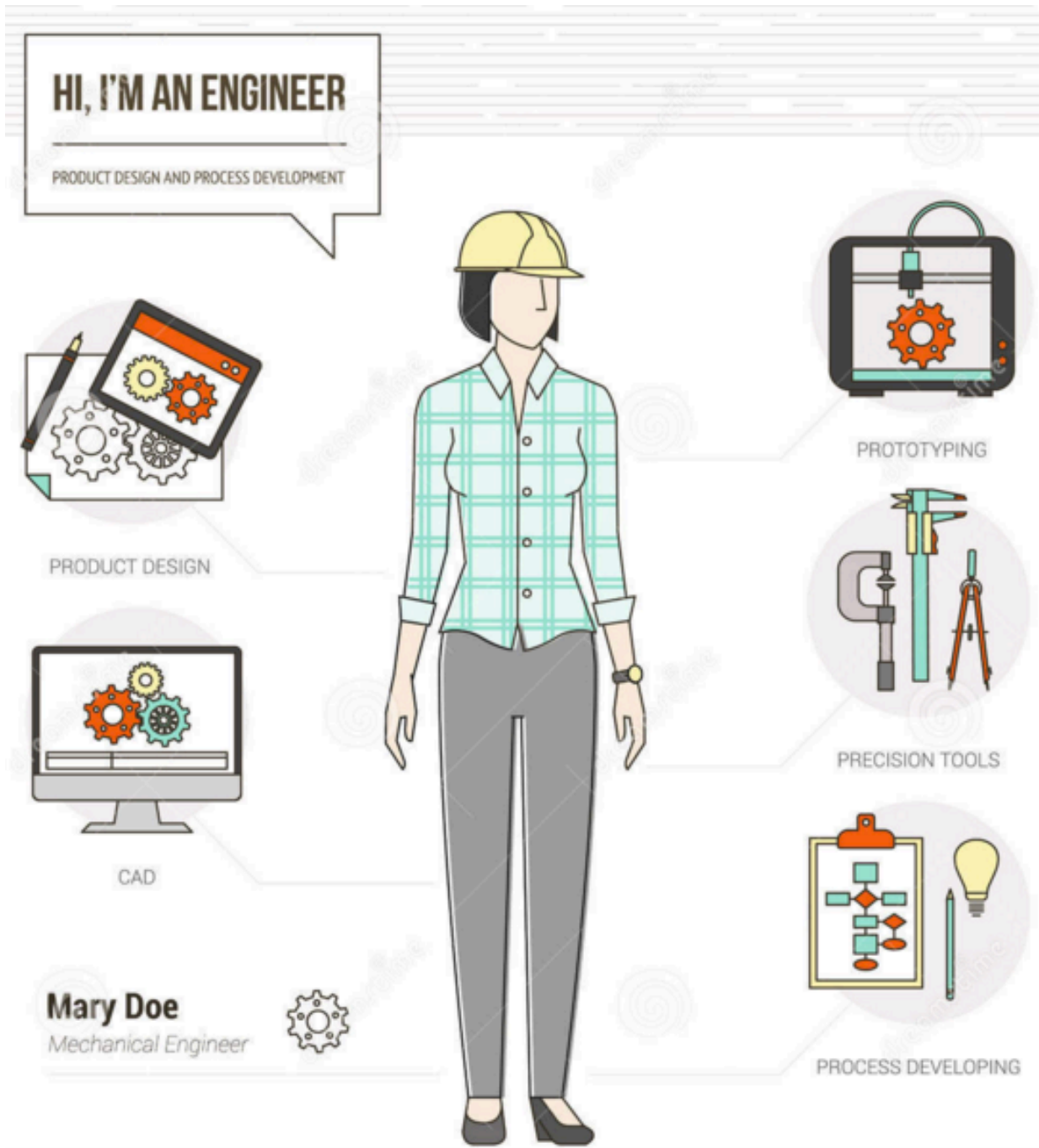


(Use Trick #2)

Grounded between digital and real assets



(Use Trick #1)



- ✓ Byzantine Fault Tolerant
- ✓ Cryptographic by nature
- ✓ PE Stamp Acts Timekeeper
- ✓ Codified in Law
- ✓ Independent of UCC
- ✓ Establish Title to Property

(Use Trick #3)

Now, let's take a look at where we are

Insurable?	Bitcoin	PE's
Byzantine Fault Tolerance	✓	✓
Multi-key Cryptography	✓	✓
Blockchain Engine	✓	✓
Proxy for Money	X	✓
Proxy for Property	X	✓

Bitcoin 1.0 was an experiment
Bitcoin 2.0 Banking (ground fault dilemma)

E&I Blockchain

Proposal: To bring the engineering profession into close alliance with the insurance industry to develop a secure decentralized blockchain where virtual assets actually represent physical assets.

Develop adjudicated smart contract structures for infrastructure, i.e., Least Common Denominator upon which everything depends

Develop means to assure that the right adjudicator is signing the right contracts.

Daniel R. Robles, PE, MIB
The Ingenesist Project and Coengineers, PLLC

ingenesist@gmail.com

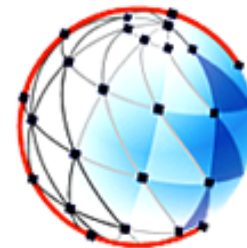
(425) 361-8499

Seattle, WA



*National Society of Professional Engineers
FinTech Task Force*

INGENESIST
THE INGENESIST PROJECT



**COMMUNITY ENGINEERING
SERVICES, PLLC**

1

1