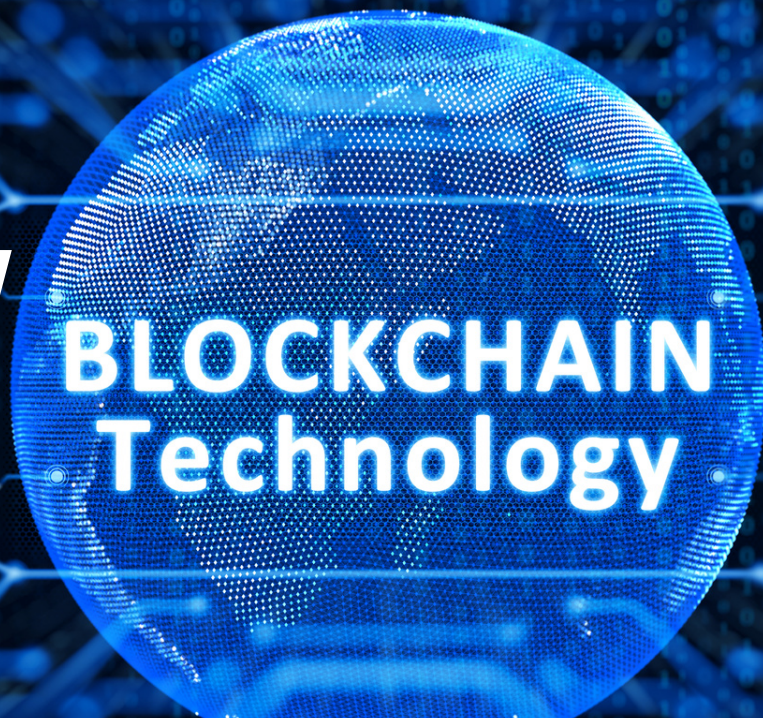


INSURANCE IN BLOCKCHAIN: UNLOCKING NEW VALUE AND ADAPTING



Blockchain Technology & Insurtech- overview



HUSSAIN FEROZ ALI
(FOUNDER & CEO)

Although blockchain insurtechs have been around since 2017, they are yet to achieve mainstream economies of scale and currently remain a small portion of the total insurance market. There are various reasons for this such as blockchain being equated with cryptocurrencies and quest for quick high profits in trading rather than seeing blockchain as a new method of operation, lack of funding, lack of collaboration between insurers and blockchain technology providers etc.

Apart from the crypto-currency booms and busts posing a serious challenge as people equates this with blockchain, the other major challenge is the high fraud/scams leading to bankruptcies. Key recent example being FTX bankruptcy which is arguably bigger than the Enron fraud. There are two parties/side to this debate; one party advocating to regulate centralized blockchains as it is a failure of regulation and corporate governance; the other party advocating for complete removal of intermediaries/administrators from the picture as fully decentralized blockchain have performed better than centralized ones like Uniswap. Both sides have their merits.

Blockchain technology is used with smart contracts that self-execute when prescribed conditions are met. This new P2P insurance model is doing away with traditional premium payments, using instead a digital wallet where every member puts his or her premium in an escrow-type account that will be used only if a claim is made. In this model, none of the members carry an exposure greater than the amount they put into their digital wallets. If no claims are made, all digital wallets keep their money.

Some Examples of Insurtechs with Blockchain Technology:



Teambrella claims to be the first community insurance provider built on Bitcoin. Its users provide coverage to each other. When one person submits a claim within his or her team, the members reimburse the individual from the collective wallet. While Teambrella is specifically focused on collision deductibles and pet insurance, the company plans to expand their coverage in the near future.



Lemonade insurtech backed a DAO (Decentralized Autonomous Organization), and it will roll out weather index insurance to African farmers. Administered by the Lemonade Foundation, the project includes representatives from the Avalanche blockchain; Chainlink, which provide real-world data to blockchains; DAOstack, a creator of DAO software stacks; Etherisc, a builder of decentralized insurance apps; Hannover Re, a German reinsurance company; Pula, an agricultural insurance startup; and Tomorrow.io, a provider of real-time weather information.



Another example is the B3i initiative. B3i initiative was launched with much enthusiasm by multiple global insurers but it became bankrupt in 2022 due to inability to raise new funding.



Example of index insurance helping vulnerable communities increase their resilience in face of climate change is Swiss Re's coral reef insurance against Hurricane. Swiss Re teamed up with The Nature Conservancy and regional governments in Mexico to help protect the Mesoamerican coral reef off the coast of Mexico's Yucatan Peninsula. Research had shown that there was a connection between a healthy coral reef and the region's ability to sustain itself economically. In other words, if the reef were to die as a result of pollution and storm damage, it would no longer be able to prevent beach erosion, which, in turn, would threaten the region's key source of income, tourism. An insurance solution was derived that would ensure rapid disbursement of funds to enable trained community members to deal with reef damage following a severe storm. It was the world's first ever nature-based solution to protect Mexico's coral reef.

How Blockchain can transform Insurance Industry

Operational efficiency:

It makes insurance invisible by making it seamless; digitizes it by connecting mobile and personal data to oracle and generating smart contracts; no need to hire a workforce of operational staff to ask customers to fill out tons of forms and scrutinize them. Smart contracts execute when conditions are met. Insurance policies sold can be doubled-tripled without the need to increase workforce proportionally. that's what exponential technologies do. Zhong An is a key example of a normal but innovative insurer adopting blockchain for operational efficiency gains.

Product Development:

Blockchain parametrizes risks so one can have an infinity of parametric insurance products made out of it as demanded by the pool customers. no longer few standardized mass retail products required to be made. It is imperative that index insurance should be developed not just for the low hanging fruits of travel and microinsurance but for also standard risks in developed countries.

Business model:

Blockchain can increase the mutuality of the pool by decentralizing power to the pool members rather than letting the middleman have all the power; The choice can be made between fully decentralized or having agent who administers the pool on behalf of the pool members.

Pricing:

Decentralized digital ID enables frictionless quote generation as personal data could be safely shared with multiple insurers leading to industry wide integration to combat money laundering, Know-you-Customer, claims database identifying groups or people with high losses or with reputation for doing dubious stuff. The most important application for this can be in Medical which suffer from high portion of claims having Fraud and Wastage (FWA) issues. Blockchain can also streamline administration of reinsurance, swaps and securitizations. Currently, securitization in reinsurance is not widely utilized by insurers usually but ease of administration can pave the way for more widespread adoption leading to better capital optimization than currently practiced.

Research from Actuarial Professional Bodies

Professional organizations such as Society of Actuaries (USA), IFoA UK also take an active part in research over blockchain to try to pave the way for first applications of actuarial work in blockchain space as well as index insurance as sub-segment within Climate Change risk resilience topic.

IFoA UK has developed a 'Climate Risk and Sustainability Course' Certificate and SOA is also collaborating with Milliman to develop Climate Risk Certificate Program.

There are also plenty of research reports made by actuarial professional bodies such as:

- SOA Peer to Peer Insurance: Blockchain Implications
- SOA report on Decentralized Finance for Actuaries- A Blockchain-based financial system
- IFoA "Blockchain and How it will change Insurance"
- IFoA "Understanding blockchain for insurance use cases - A practical guide for the insurance industry"

How Actuaries can help here

Insurtechs are trail-blazing platforms but they have a high failure rate and most cannot match the existing insurers for financial compensation so there is little incentive for actuaries to develop in this area further.

Due to lack of regulations in this space, there is no guaranteed stream of 'regulatory/ compliance' work for actuaries. Actuaries are not full-stack developers or data engineers who are necessarily needed to great data pipelines, apps, websites etc; actuaries don't come from software engineering background but are very good in domain skills; domains skills of understanding insurance, finance, statistics, modeling.

Some instances of projects that actuarial community can work on to start penetrating this emerging work stream are:

- agent-based modeling and simulations based on blockchain smart contracts and their conditions. This modeling to reveal simulated experiences of how much loss will stochastically happen and how to reserve or price for that based on risk metrics like Value at Risk or Tail Value at Risk.
- overall risk management, qualitative risk registers, quantitative scenario analysis and stress testing to see when pools will become unviable practically. One way to find common ground is to see existing datasets; deduce it's mathematical properties like fit distributions to it; then simulate it and create simulated datasets that need to be realistic and not be off the mark a lot; and then hopefully carry out what if scenario analysis on it.

Thinking outside the box

Actuaries to apply traditional work in new light like we all know IBNR chain ladder but that is basically cohort analysis that can be applied to find out plenty of things from the data from checking fraud levels, to revenue-based trends like customer churn and lifetime value.

The most famous example of applying this IBNR triangulation chain ladder to fraud analysis instead of reserving is that of Roelof Botha who is an actuary and had applied it as CFO of Paypal way back:

“Soon after joining, I built a bottom up financial model to help understand the drivers of the business.....I applied the chain ladder technique to our fraud losses to try to understand their cumulative distribution function. I was trying to work out how long it takes on average for fraud to be notified. I realised that our losses were much larger than we had believed. I quantified the size of the problem and spurred engineers to build frameworks for fraud control. We caught the problem early and saved the company from bankruptcy. It was an interesting experience to apply actuarial techniques in a very different context”.

Message for Fellow Actuaries-

Excerpt from SOA past President MARK J. FREEDMAN'S address - 2013 SOA Annual Meeting

“Now I want to address a question many actuaries have asked me over the past year. They ask: “Why can't we just keep doing things like we always have? Demand for actuaries is good. Salaries are high. Why mess with a good thing? Let's just make our exams tougher (because we all know they've gotten easier over the years). We should just concentrate on that, keep our focus on the United States and Canada, and yes, we should also have some continuing education, but let's do that cheaper.....”

IF WE WANT TO STRENGTHEN OUR PROFESSION, WE CANNOT SIT STILL”

Notes:

<https://www.actuaries.org.uk/system/files/field/document/Blockchain%20presentation%20v1.0.pdf>
<https://www.coindesk.com/business/2022/03/22/lemonade-is-working-with-avalanche-chainlink-on-weather-insurance-for-farmers/>
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<https://www.soa.org/4954f3/globalassets/assets/files/resources/research-report/2022/decentralized-finance.pdf>
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<https://www.theactuary.com/features/2014/04/2014/03/26/interview-roelof-botha>



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