IN THE NAME OF GOD

بِسمِ اللهِ الرَّحمنِ الرَّحيمِ

ISC SID CIVILICA

Iranian Insurance Research Center (IIRC)

BIMEH MARKAZI
CENTRAL INSURANCE OF IR IRAN

سندیکای بیمه‌گران ایران
IRAN INSURERS SYNDICATE

INSURANCE AND DEVELOPMENT CONFERENCE

30th National and 11th International Conference on Insurance and Development (ICID 2023)

The Evolution of Insurance Industry Ecosystem

(Takaful, Governance, Modern Technologies)

Improving Takaful Industry Using Smart Contracts on the Blockchain

Siti Zulaikha and Hazik Mohamed

The Importance of Insurance and Takaful

- **Direct gross insurance premiums make up about 9% of global GDP**
- According to the Organisation for Economic Cooperation and Development (OECD), direct gross insurance premiums make up about 9% of global GDP, or close to one-tenth of all economic activity worldwide.

Stimulating innovation and promoting economic growth

- Takaful and insurance companies are essential for stimulating innovation and promoting economic growth on a large scale. Takaful provides safety to car owners, travellers, homeowners, and farmers daily as a result, trust is at the heart of this promise.

30th National and 11th International Conference on Insurance and Development (ICID 2023)

Global Takaful Market

Takaful Market

Global takaful market size reached US$ 33.6 Billion in 2023.

- Looking forward, IMARC Group expects the market to reach US$ 74.0 Billion by 2032, exhibiting a growth rate (CAGR) of 8.9% during 2024-2032.

Projected to Reach $45.95 Billion by 2027

- Global Takaful Market Projected to Reach $45.95 Billion by 2027, Driven by Technological Advancements and Increasing Muslim Population.

Global Takaful Market Drivers:

Rapidly gaining momentum,

- Takaful is rapidly gaining momentum, particularly in the Asia Pacific and the GCC region, owing to a large Muslim population.

Majority of the world's Muslim population is young

- The majority of the world's Muslim population is young with 60% of this entire population being less than 25 years of age which has the potential to represent a customer base for a fairly long duration.

Penetration of conventional insurance is relatively low

- The penetration of conventional insurance is relatively low in affluent Muslim regions like the GCC. As a result, Takaful is perceived as a key instrument to raise insurance awareness and has huge opportunities in these countries.

Global Takaful Market Drivers:

- ❖ Ethical investment policy
- ❖ Strong growth prospects
- ❖ Price competitiveness
- ❖ Takaful represents a strong business proposition
- ❖ Has a significant share of non-Muslim customers.

Definition of Takaful

- *A scheme based on brotherhood, solidarity and mutual assistance which provides for mutual financial aid and assistance to the participants in case of need whereby the participants mutually agree to contribute for that purpose.*

- Takaful is based on the concept of social solidarity, cooperation and mutual indemnification of losses of members. It is a pact among a group of persons who agree to jointly indemnify the loss or damage that may inflict upon any of them, out of the fund they donate collectively.

- The Takaful contract so agreed usually involves the concepts of Mudarabah, Tabarru´ (to donate for benefit of others), and mutual sharing of losses with the overall objective of eliminating the element of uncertainty.

Differences between Takaful and Insurance

Takaful	Conventional Insurance
The individual agrees to contribute to a fund that may help those in need.	The risk bearer is the insurance company, which is purchased as a personal financial security for an individual.
Based on cooperation.	Based on commercial factors only.
Takaful investments will be governed by rigorous regulations. Takaful cannot engage in anything that involves gambling, uncertainty, or lending money at exorbitant interest rates.	The conventional insurance investment units will invest based on their assessment of what fits their profiles.
Subject to Islamic laws and government laws.	Subject to government laws only
Takaful plan holders and shareholder's capital can only be invested in Islamic-compliant investment funds.	Capital of the premium for conventional insurance is invested in funds and investment channels that are not necessarily Islamic compliant
Free from Riba (interest), Gharar (uncertainty) and Maysir (gambling).	Has elements of interest, gambling and uncertainty.
Takaful participants agree to share and distribute risks.	Risk is transferred from the individual to the conventional insurance provider.
Investment profits will be distributed to other participants and shareholders.	Extra money and profits belong to insurance company shareholders.

Mudarabah Model

The sharing of surplus

- The sharing of surplus that may emerge from the operations of Takaful is made only after the obligation of assisting the fellow participants has been fulfilled.

Shareholders of the Takaful Operator:

- Mudarib bear expenses for the investment activities
- The participants as Rab-al-maal bear the expenses for the underwriting operations.

Financial losses

- Financial losses are required to be covered only by the participants, such as in form of a reduction in of their capital or by paying higher contributions;
- while the Takaful Operator may only lose its time and effort of labour spent in managing the underwriting operations.

Mudarabah Model

Takaful operator accepts contributions payment from participants

- The Takaful operator accepts payment of the contributions from participants on the basis of equity partnership that is a *risk-sharing mechanism* where the profit is shared between the Takaful operator and the participants in a predetermined manner.

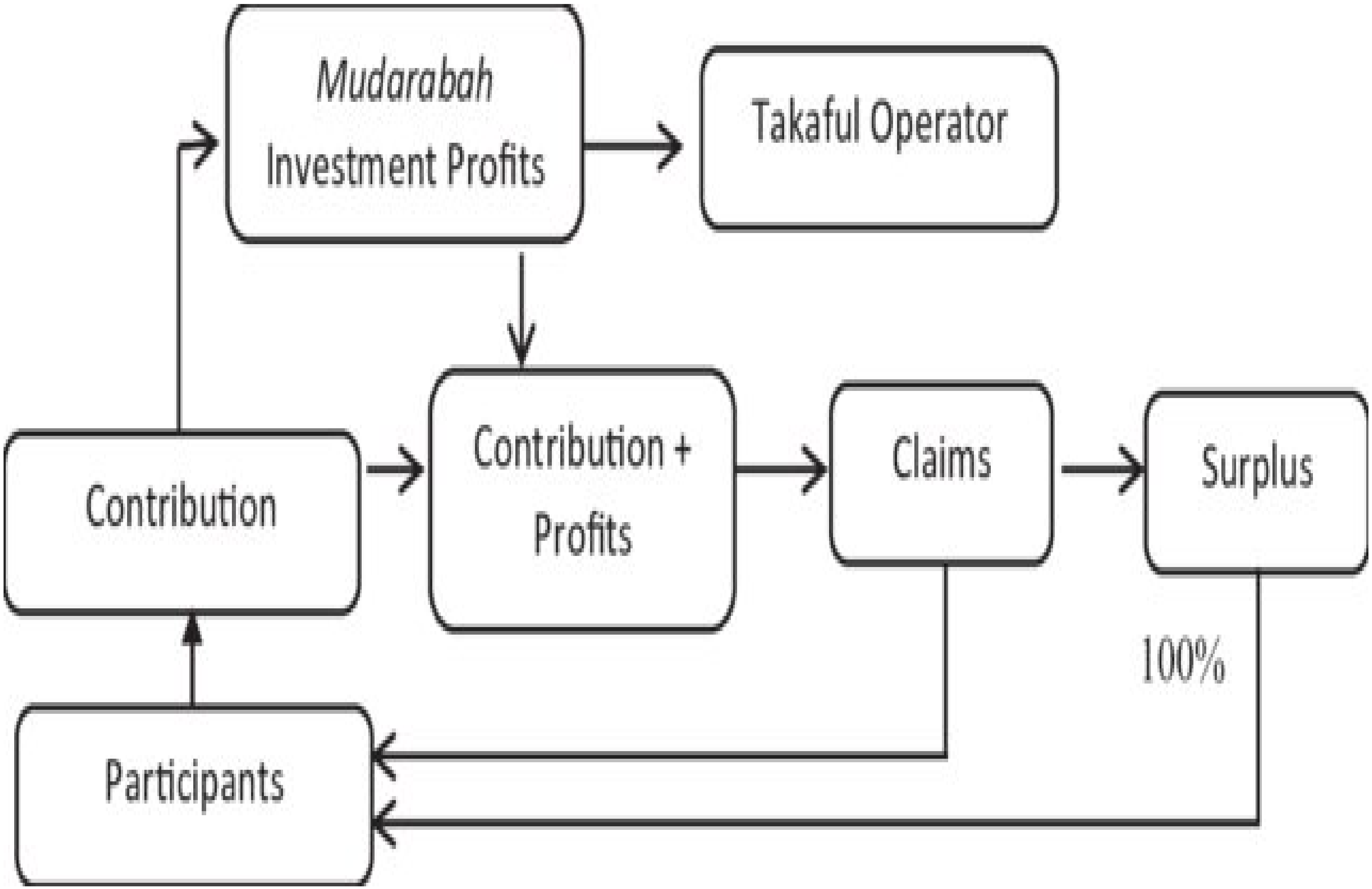
The surplus from the operations of Takaful is to be shared

- The contract specifies how the surplus from the operations of Takaful is to be shared, in accordance with the principle of Mudarabah, between the participants as the providers of capital and the Takaful operator as the entrepreneur.

The sharing of such profit

- The sharing of such profit is as mutually agreed in advance between the contracting parties and depending on the developmental stage of the company.

Basic Mudarabah Model



Source: Engku Rabiah & Hassan Scott, 2008, pp.45

Wakalah Model

Under Wakalah model:

- The group of participants can delegate their rights or business to the Takaful operator (Wakeel), who then acts as their agent and representative.

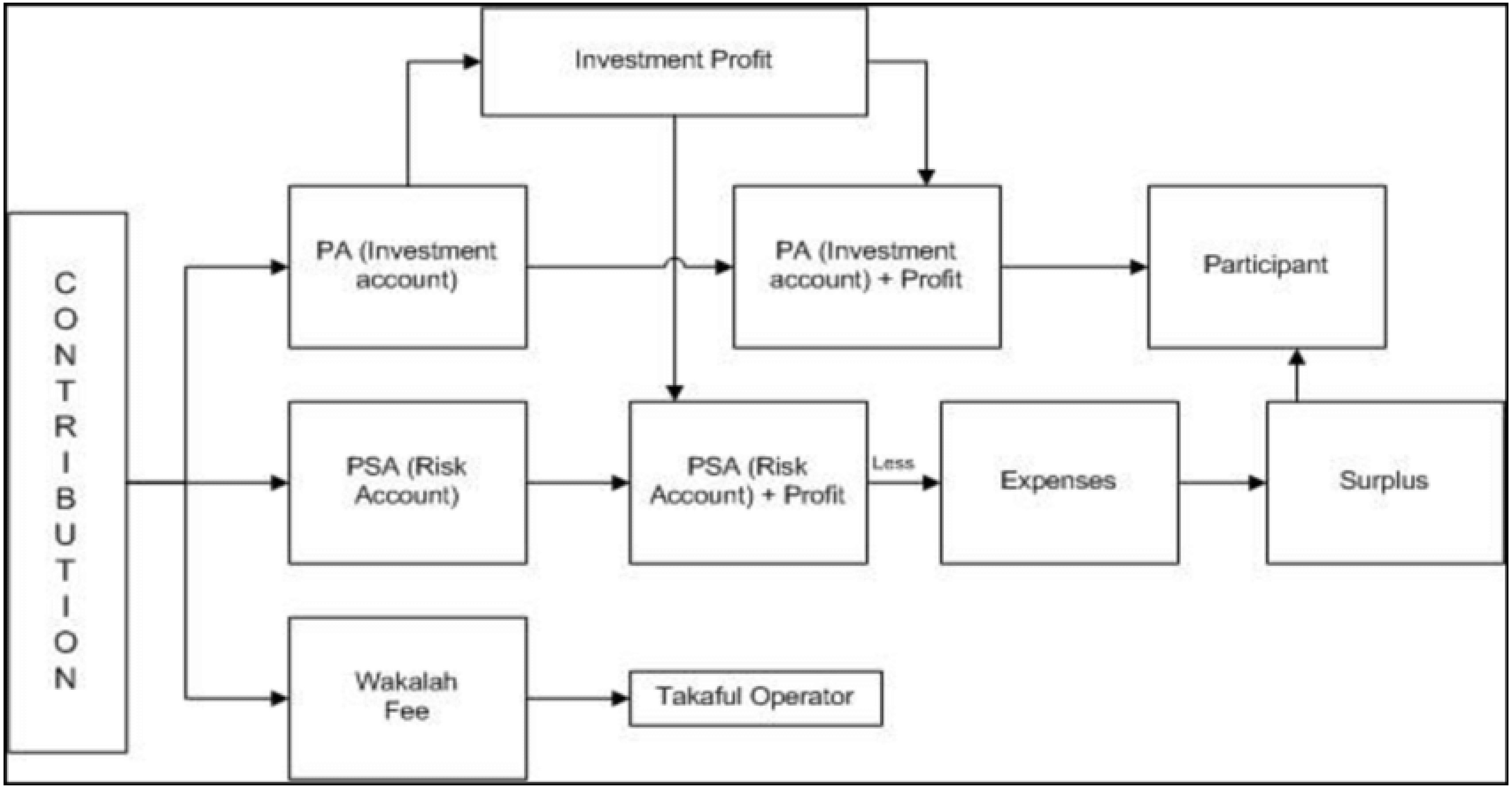
Shareholders of the Takaful Operator:

- ***Provide*** the capital to establish the Wakalah Takaful as a donation
- ***Do not receive*** any share of the income generated from investing the Participants Takaful Fund.
- ***Assumes*** the business risk in developing and operating Takaful business on behalf of the participants,
- *But **Never participates*** in the mutual underwriting losses.
- *It **generates its income by***: charging a Wakalah fee for managing the underwriting operations and investing activities, based on the level of contribution, investment returns and generated surplus.

Wakalah Model

- The Takaful Operator generates its income bycharging a Wakalah fee for managing the underwriting operations and investing activities based on the level of contribution, investment returns generated surplus.
- This fee rate is fixed annually in advance and should be approved by the Shari'ah Supervisory Board of the Takaful Operator.
- All operating expenses are charged to the Participant Takaful Fund while expenses for the investment activities are charged to the Takaful Shareholders Fund.

Wakalah Model Operation



Source: https://www.financialislam.com

30th National and 11th International Conference on Insurance and Development (ICID 2023)

Hybrid of Wakalah and Mudarabah

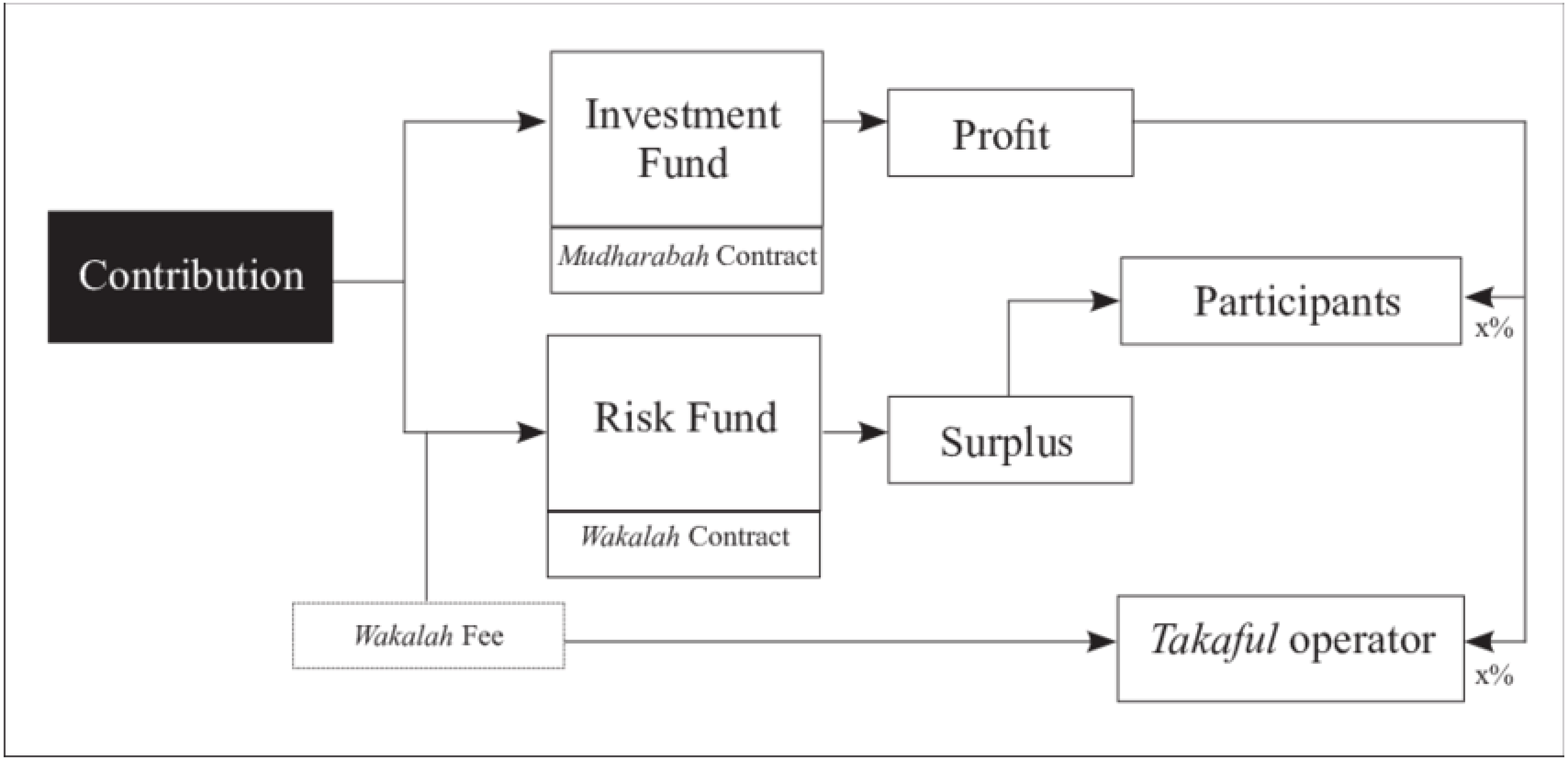
3:

In this model:

- Wakalah contract is used for managing the Takaful underwriting operations
- The Mudarabah contract is used on the investment side for the participants Takaful Fund.

“ However, these combinations may also have some features where that can be more effective than others and where they would need to be adapted to the specific context of the Takaful required by participants.”

Hybrid of Wakalah and Mudharabah Model



The Problem of Takaful and Insurance

- **42% of customers do not have complete faith in their insurer**

According to research conducted by The IBM Institute for Business Value (IBV) in 34 countries between May and July 2020, 42% of customers do not have complete faith in their insurer as they have no trust to Insurer companies.

- **Problem in underwriting policies and processing**

Underwriting policies and processing claims more time-consuming, manual, expensive, and complicated for everyone.

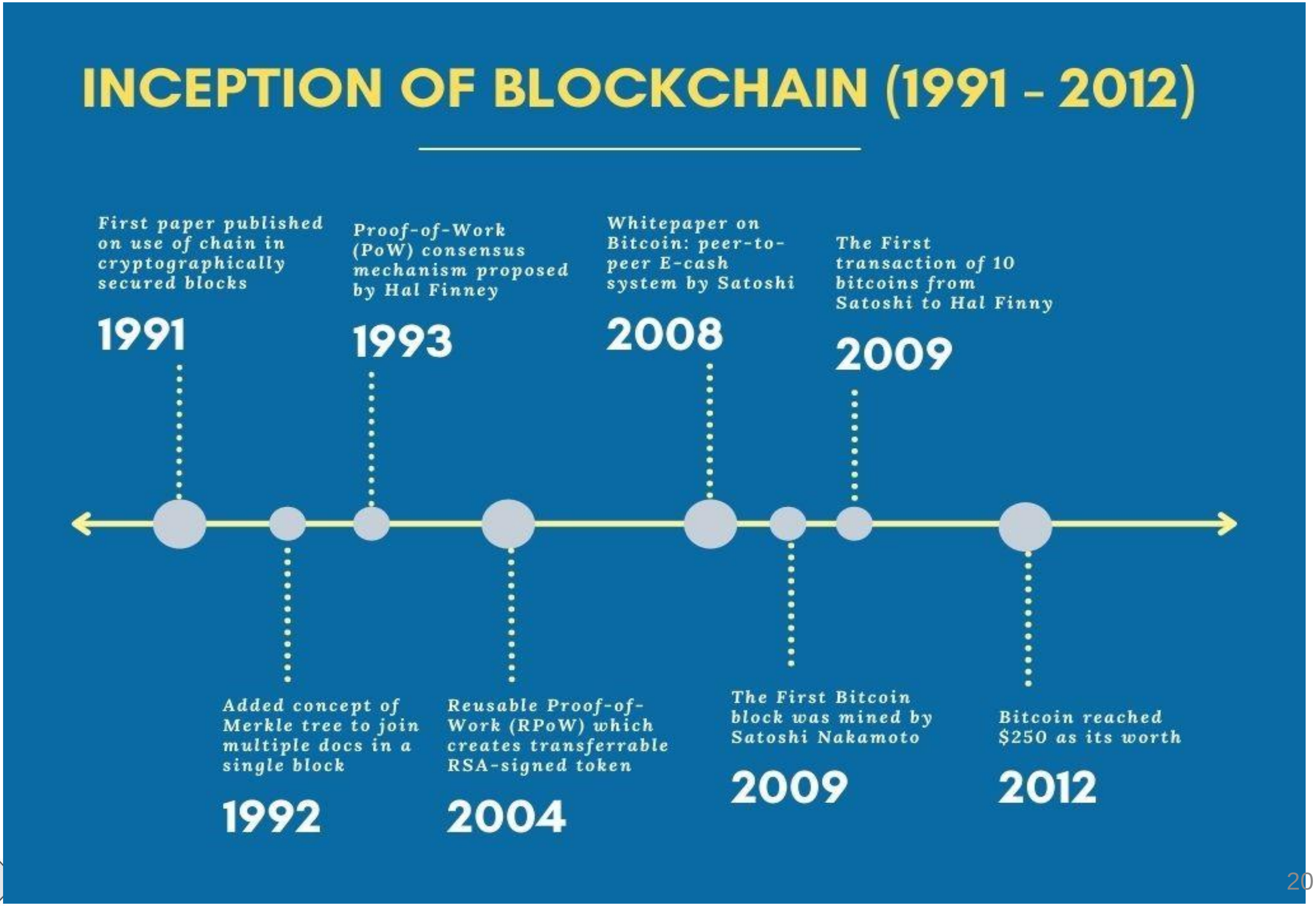
- **The pricing and value of insurance plans are out of balance**

The pricing and value of insurance plans are out of balance as a result of this lack of transparency, which also encourages policyholders to manipulate the system.

Blockchain Technology as solution

- A blockchain is “a distributed database that maintains a continuously growing list of ordered records, called blocks.” These blocks “are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.
- A blockchain is a decentralized, distributed and public digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the consensus of the network.
- To overcome the problems, Insurance industry can develop smart contracts using blockchain technology to track takaful claims and automate antiquated paper-based procedures.
- Insurance companies can specialize in pre-made underwriting models but in data analytics services, emerging projects have a strong foundation to launch operations to finely tuned machine learning models and proprietary data sets.

History of Blockchain



Benefits of using blockchain in insurance

1. Transparency:

Because of the decentralized and open nature of blockchain, anyone can see any transaction logged into the database. Insurers in the linked network can access historical claims information quickly and accurately. “Using a blockchain, insurance companies share a trusted, single source of truth that can eventually reduce fraud and make managing claims much easier.

2. Accurate risk rating:

Insurers and reinsurers sharing access to blockchain ledger can access data related to policies, premiums, and loss history, which helps to simplify the underwriting process.

3. Task automation:

All smart contract-related processes can be automated and rendered securely using a blockchain, eliminating the need for human intervention in a claim. On the claims side, blockchain can empower straight-through processing and initiate faster payouts for policyholders.

Benefits of using Smart Contract in Insurance

4. Automated Claims Processing:

Smart contracts can automate many of the steps involved in claims processing, eliminating the need for manual processing by claims adjusters. This can significantly reduce the costs associated with claims processing and can speed up the claims process.

5. Self-Executing and Tamper-Proof:

Smart contracts are self-executing, meaning that they execute automatically when certain conditions are met. They are also tamper-proof, meaning that once they are created, they cannot be changed without the agreement of all parties involved. This makes it much more difficult for fraudsters to manipulate claims data or falsify claims.

6. Verification of Claims: Smart contracts can be programmed to verify claims automatically, using data from IoT devices, such as smart home devices or wearables. This eliminates the need for manual verification by claims adjusters and can speed up the claims process.

Benefits of using Smart Contract in Insurance

7. Reduced Administrative Costs:

By automating many of the steps involved in claims processing, smart contracts can significantly reduce administrative costs associated with claims processing. This can lead to cost savings for insurers, which can be passed on to policyholders.

8. Increased Transparency:

Smart contracts are transparent, meaning that all parties involved in the contract can see the terms of the contract and the conditions that need to be met for the contract to execute. This can increase trust between insurers and policyholders and can reduce the likelihood of disputes.

Overall, smart contracts have the potential to reduce costs, speed up the claims process, and reduce fraud in insurance claims management. As the technology continues to evolve, we can expect to see more and more insurers adopting smart contracts for claims management.

The steps to automate the claim process using smart contracts:

1. **Define the terms of the contract:** This involves determining the conditions that must be met for the smart contract to execute

2. Create the smart contract: This involves writing the code that be written in a programming language that is compatible with the blockchain platform being used.

3. Deploy the smart contract: This involves uploading the code to the blockchain platform and creating a new smart contract instance.

4. Submit the claim: When a policyholder submits a claim, the information is entered into the smart contract. The smart contract then checks to see if the conditions of the contract have been met.

To automate the claim process using smart contracts, we can follow the following steps:

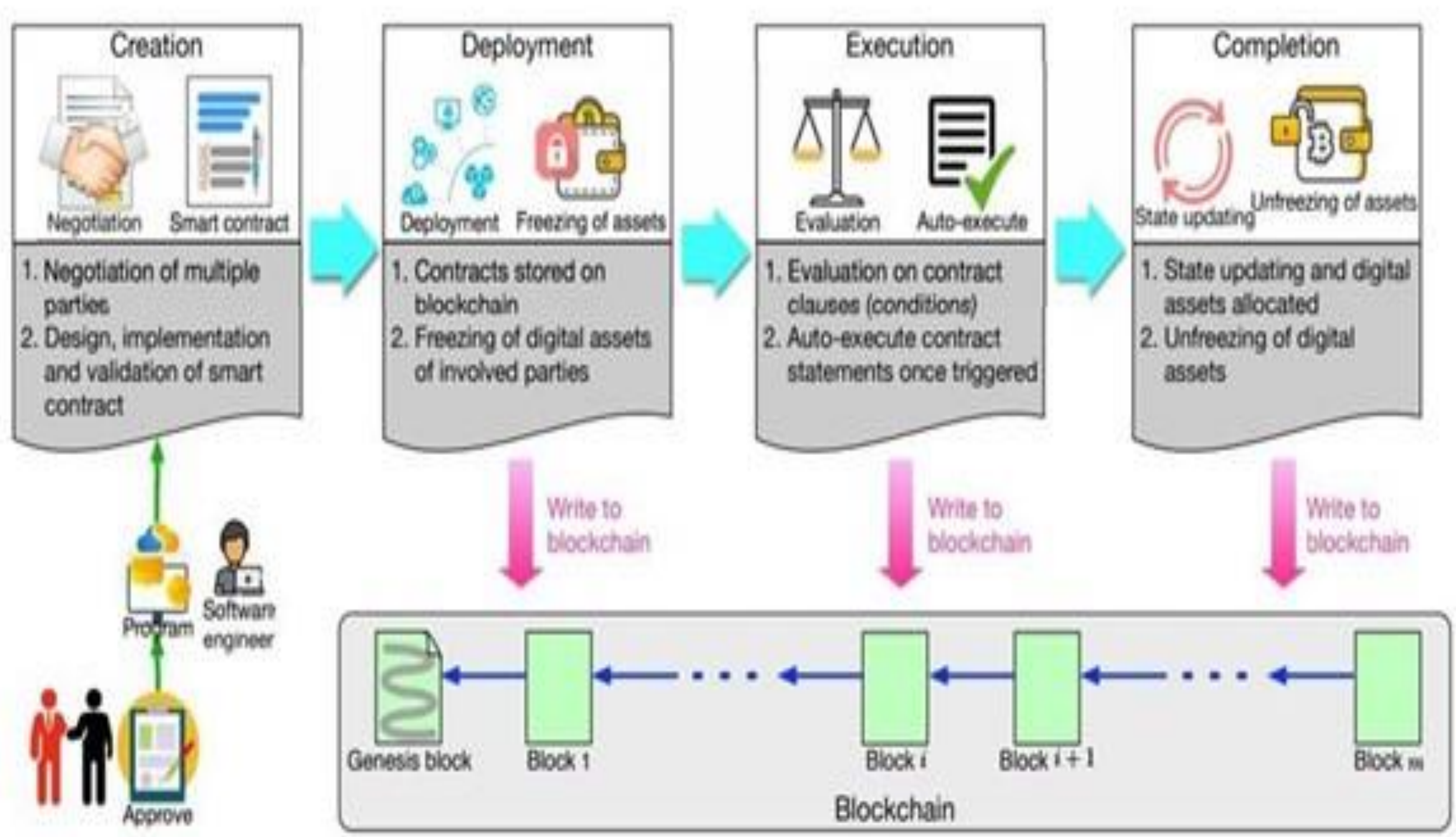
5. Verify the claim: Once the claim is submitted, the smart contract can automatically verify the claim. This can be done using data from IoT devices, such as smart home devices or wearables.

6. Execute the contract: If the conditions of the contract are met, the smart contract will execute automatically

7. Update the blockchain:

Once the contract has executed, the blockchain is updated with the new transaction. This ensures that the transaction is recorded on the blockchain and can be verified by all parties involved in the contract.

Stages of a Smart Contract's Lifecycle



Blockchain is more suited if the following conditions:

- Involves multiple parties
- Involves new intermediaries
- No need for a central trusted authority for executing various transactions
- Accurate record of the date and time of each transaction needs to be captured
- Retroactive manipulation of data is not encouraged
- Multiple uses of the same data is possible by different stake holders

Medical claims processing

- The claims process today has the potential for multiple calls, partial payments, disputed coverages, errors in billing, and crossed payment / billing cycles with delinquent bills sent through collection process .
- By capturing and tracking changes to the claims file on a shared ledger, and using smart contracts to confirm the applicable terms and conditions at various processing steps in the claims processing chain, errors and re-work can be reduced and the accuracy and traceability of claims can be improved.

Insurance of high-value assets (Ex:Diamonds)

- Blockchain technologies can be used to catalog and verify the ownership of high-value assets, such as art, jewelry and other collectibles. This is already taking place as companies such as Everledger have emerged. Everledger supports diamond certification and related transaction histories through blockchain technology for insurance companies, owners, claimants and law enforcement.
- With this information, Everledger knows who owns which diamond and where it is at any given point in time. It has the capacity to trace the movement of diamonds on platforms such as eBay and Amazon as they are bought and sold and works together with insurers when diamonds are reported stolen, and alongside Interpol and Europol where diamonds are crossing borders and entering black markets.
- By tracking individual and cumulative values using events and smart contracts, better coverage and risk management processes can be recommended, improving value to the customer
- Faster cycle time and possibly no touch claims handling May reduce total claims cost due to enhanced information available to establish suitable replacement

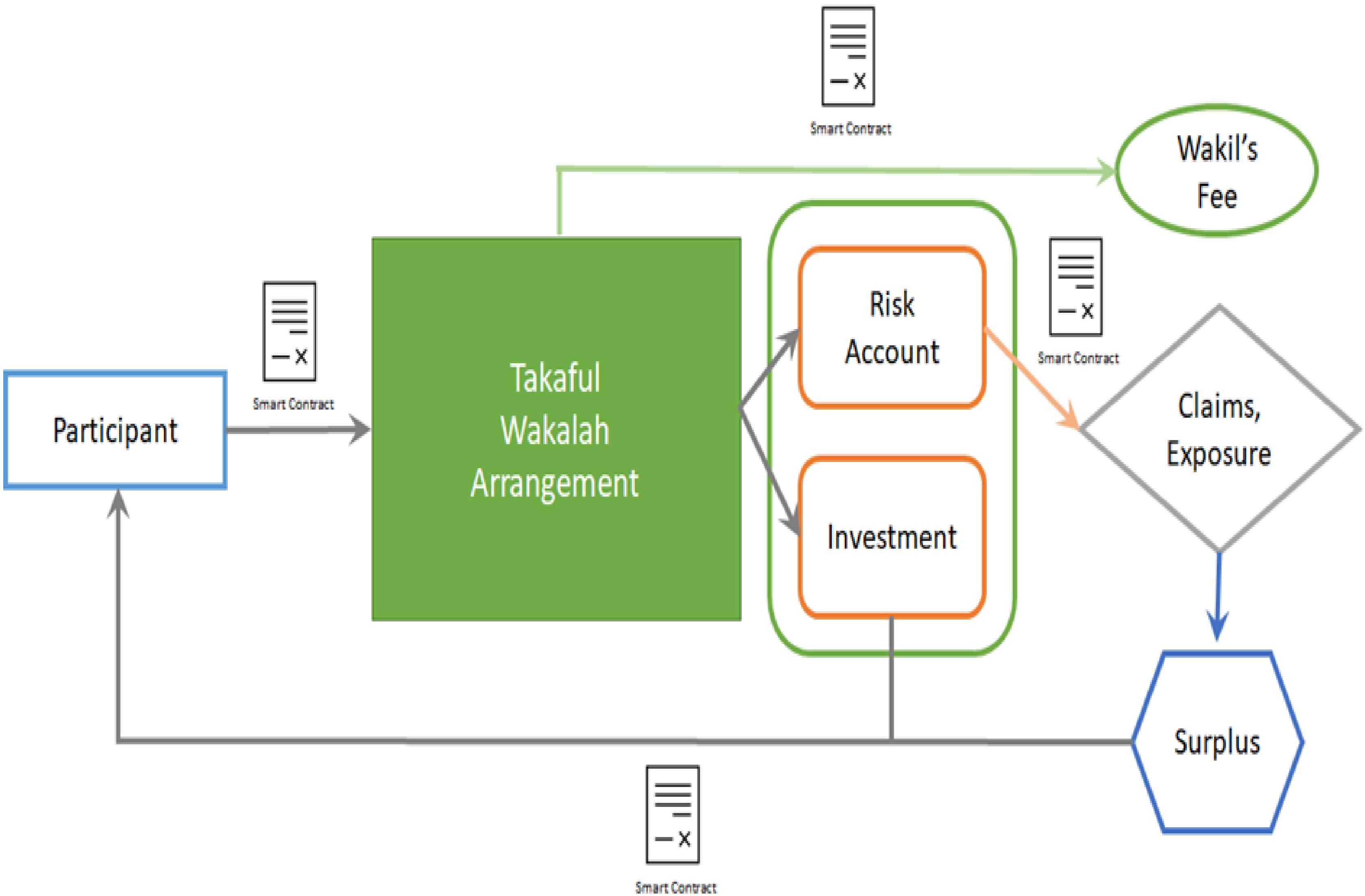
Reinsurance

- Blockchain also has potential uses in reinsurance. Blockchain can be used to record details of claims so that insurers and reinsurers can accurately divide costs between them. In this case, since the blockchain provides an immutable record of claims, including time-stamping when those claims were made, this provides reinsurers with certainty that the information provided existed at that point in time
- A shared blockchain between insurers and reinsurers can provide a common view to contract details and associated financials, reducing disputes, easing re-insurance audits and smoothing cash flows. Smart contracts can automatically perform accounting adjustments as and when payments are exchanged.

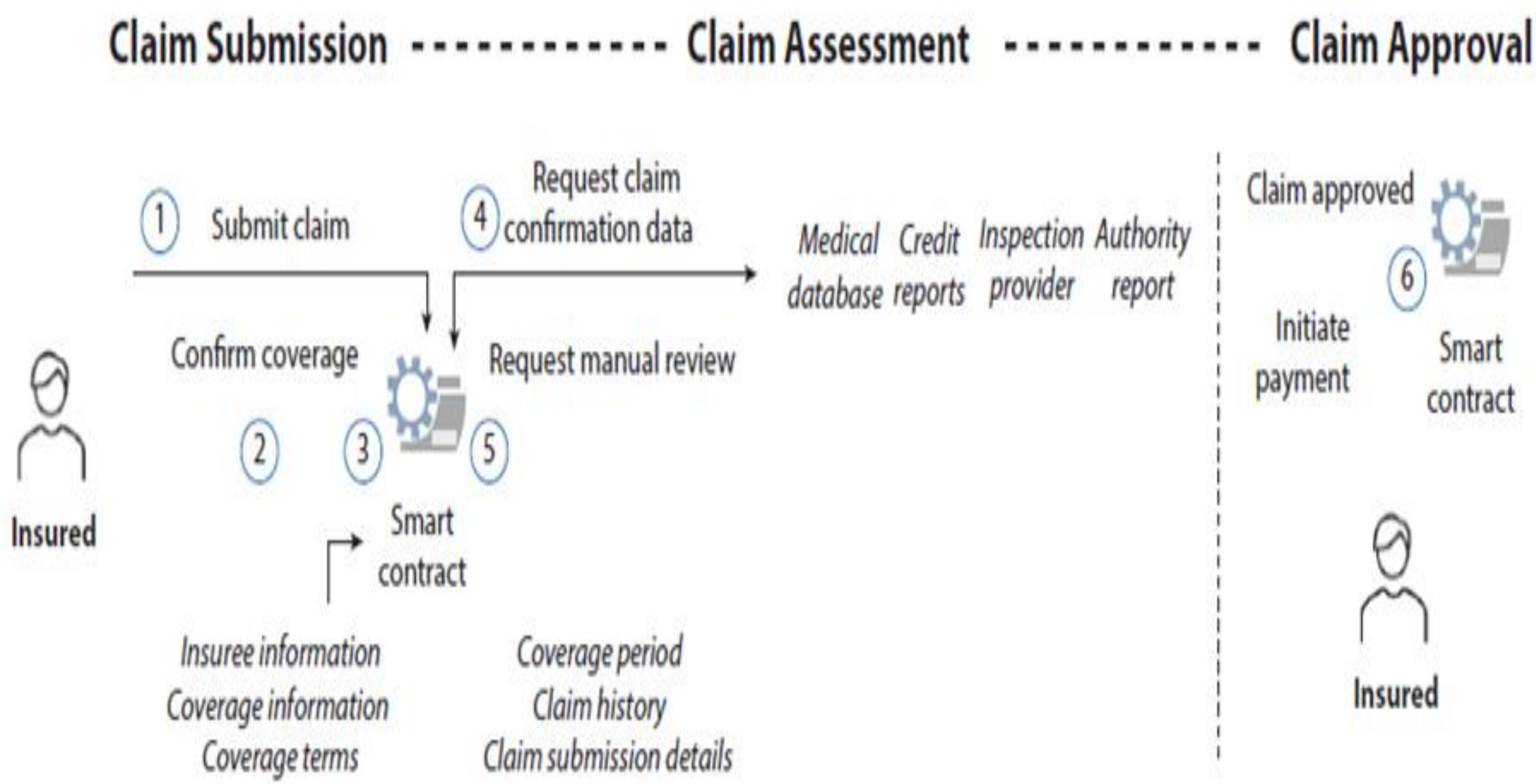
Flight insurance policy

- It was observed that Passengers covered under Flight Insurance policies did not claim their travel insurance for delayed flights since filing a claim with all the information and evidences was cumbersome process for some customers.
- The smart contract solution automates claim pay out instantaneously to the affected passengers based on the flight data feeds. These smart contracts initiate payouts for insured flight tickets when cancellations or delays are reported from verified flight data sources (via so called “oracles” for making external sources usable for smart contracts in the blockchain).
- It cuts away the claim notification step by the insured and processes claim automatically by verifying facts from external parties resulting in closing the claims quicker, bringing down the cost of processing claim and achieving higher customer satisfaction.

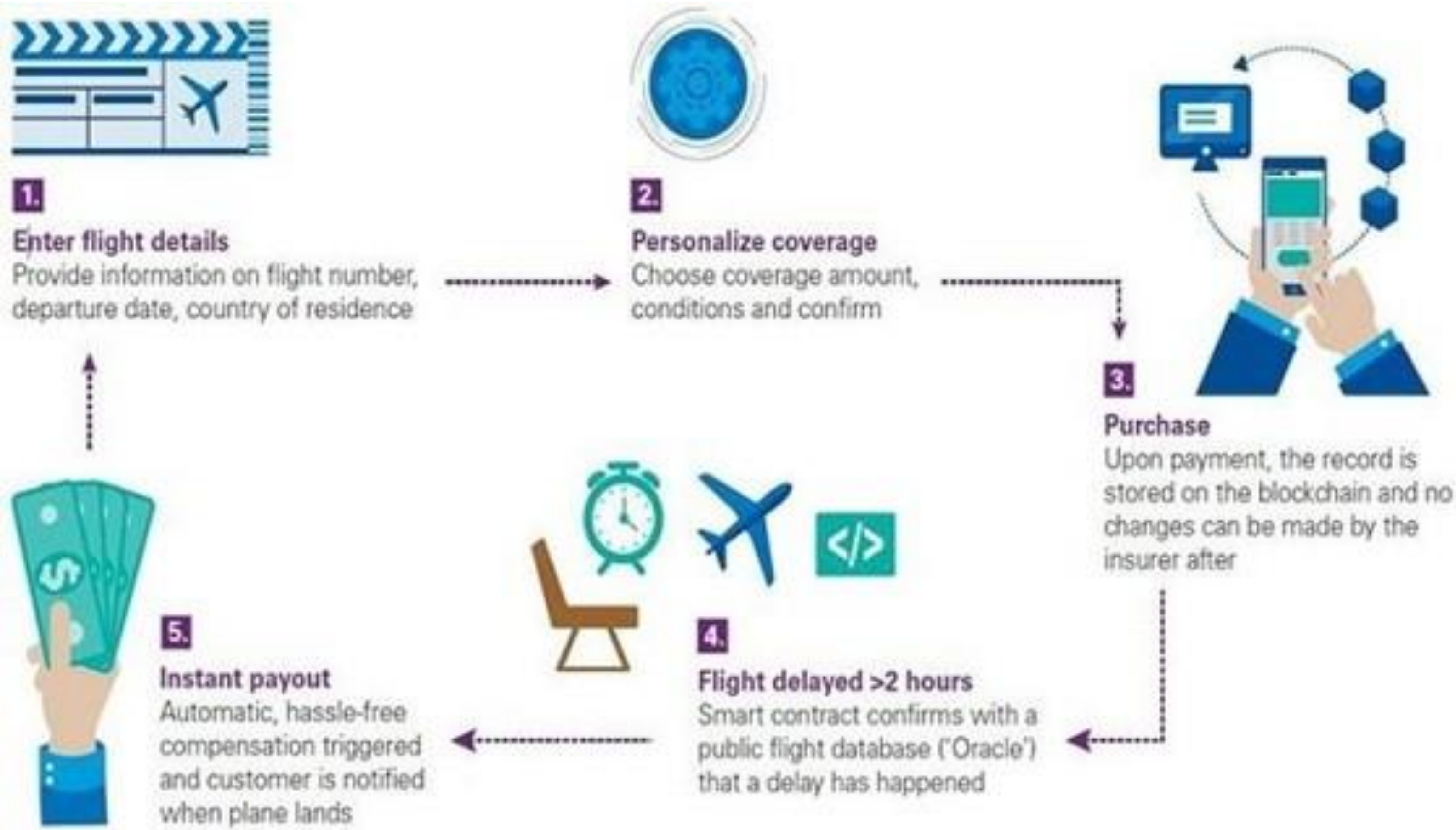
Smart Contract Use in the Takaful Process



Automation of the Takaful Claims Process



Example of Smart Contract in Flight Insurance



Source: Dheeraj Pandey | January 24, 2020

Barriers Facing Smart Insurance Contracts

- The scope of the contract is limited.
- The technology is complex.
- Poor coding leads to contractual errors.
- Despite the fact that eliminating human input is one of the primary benefits of smart contracts in insurance, smart contracts still require human involvement during the development stage.
- Legal regulations remain limited.

Case #1

- Simon was a 69-year-old retiree. He planned to travel to a few cities in China with his wife, Cindy, in late January 2020. In November 2019, he purchased the air tickets from a budget airline. In early January 2020, Simon and Cindy saw in the news that there was an outbreak of severe pneumonia cases in Wuhan city, Hubei Province, China. They did not pay serious attention to this news because Wuhan city was not on their itinerary and they thought these cases were of a one-off nature.
- As the travel date drew closer, Simon and Cindy purchased a single-trip travel insurance policy. As was their practice, they made the purchase 3 days before their scheduled departure. But on the following day, their budget airline emailed them to state that their flight to China was cancelled. In light of the flight cancellation, Simon and Cindy were unable to continue with their trip. They proceeded to file a claim for the "Trip Cancellation" benefit under their travel insurance policy. They wanted to claim for the air tickets and accommodation they had paid for upfront. These amounted to $800 per person. After reviewing their claim, the insurer rejected it. The insurer explained that they were not liable for the claim as the Covid-19 situation in China at the time they purchased their insurance was a known event. Further, the insurer had published on their website that any claims relating to Covid-19 for any travel insurance policies purchased after the cut-off date would not be admitted. Both Simon and Cindy came to FIDReC after unsuccessful appeals to the insurer. Simon and Cindy went through mediation at FIDReC.
- At mediation, it was pointed out that at the time of purchase of the travel insurance, the travel advisory issued by the Singapore Government only referred to Wuhan city and not to other parts of China. The insurer also acknowledged that Simon and Cindy may not have been aware of their website announcement. The insurer offered to settle the dispute on a goodwill basis for $200 per person. This being a refund of the premiums paid with a nominal deduction for administrative charges. Both Simon and Cindy accepted and entered into a written settlement with the insurer.

30th National and 11th International Conference on Insurance and Development (ICID 2023)

Key Learning Points

- Buy your travel insurance early. The future is unpredictable and unexpected situations can happen anytime. If you are purchasing a single-trip travel insurance policy, you can mitigate your risk by doing so as soon as you have confirmed your trip.

- For frequent travellers who have an annual travel insurance policy, ensure that your insurance policy is still in force and the effective coverage period covers the entire period of your trip. You may not be covered under the insurance policy if it expires during your trip.

- Before purchasing your travel insurance policy, always shop around first. Although many travel insurance policies provide similar cover, the scope and ambit of the cover may differ.

- Pay attention to the Terms and Conditions of the insurance policy. Some travel insurance policies may not cover certain situations or events. Choosing a suitable travel insurance policy will help to minimise your inconveniences and losses.

- Before filing the claim, make sure that you have all the documents required by the financial institution. The required documents are generally listed in their claim form or their website.

- In most cases, the financial institution will need you to show documentary proof that the claims you are making will not be refunded. It is prudent to get this written confirmation before submitting your claim.

Case #2: A health insurance claim

- Sally purchased a hospital and surgical insurance policy from her brother-in-law a year ago when she was 40 years old. Because she trusted him, she left him to fill out all the details and signed where he told her to. Her brother-in-law went through with her a list of questions at the end of the proposal form and the terms and conditions of the policy, but Sally did not pay much attention at the time.
- Unfortunately, Sally was diagnosed with a tumour on her breast. She was admitted to the hospital for surgery. Sally chose a private hospital. After her surgery and hospital stay, Sally submitted a claim for reimbursement to the insurer. As part of its usual process, the insurer contacted Sally's doctor to request information on Sally's condition. It was then that the insurer found out that Sally had a history of diabetes. Sally had failed to disclose the information in the insurance proposal form.
- The insurer informed Sally that they would have to void the policy because she had not disclosed material information. Sally appealed to the insurer without success and later turned to FIDReC for help.

- At the mediation, the insurer's representative showed Sally the proposal form she had signed where she had answered "no" to the question asking if she had diabetes. The insurer's representative also showed Sally the warning in red font on the form that said that if the proposer did not fully and faithfully give the facts known or ought to be known by them, they may receive nothing from the policy. Sally tried to explain that she was not aware that she had to declare her diabetes diagnosis. Her diabetes was very mild and was well managed. She also stated that diabetes did not have any connection with the tumour on her breast. The case manager suggested that Sally could provide a medical report and history of her diabetes. This information would help the insurer to assess her claim. The insurer agreed to consider the medical report if Sally could provide it.
- After some further exchanges of correspondence, including a new medical report, the insurer agreed not to void the policy on a goodwill basis. However, the insurer revised the premiums and policy exclusions. The insurer was not able to reimburse Sally's claim because there had indeed been a material non-disclosure. Sally accepted the arrangement as it was important for her to remain insured.

Key Learning Points

- **Mediation is a process that can help both parties effectively resolve a dispute**. When a dispute arises, there are naturally a lot of emotions and feelings of unhappiness. Separating the people from the problem can you help you present your case more effectively and persuasively.
- There is **no guarantee that you will be able to achieve a settlement at mediation**. If a case is not settled at mediation, the FIDReC mediator will offer you an opportunity to refer your case for adjudication.
- It is important to **carefully read and understand the questions in the insurance proposal form and answer them truthfully**. At the end of the day, the policy applicant is the one responsible for the answers in the insurance proposal form
- Insurance contracts are a special type of contract that rely on utmost good faith. It is better to **declare all your pre-existing conditions** to avoid disputes later. If you are unsure whether a condition should be declared, the insurance proposal form would often advise that you declare it. When in doubt, ask the insurer for clarification. What is material to the insurer may be perceived as not material to you.

Case #3 : A vulnerable customer who mistakenly purchased an insurance policy

- Mdm Wong visited the Bank to place S$20,000 into a fixed deposit. Mdm Wong was retiring in 5 years' time and she explained in Mandarin to Mr Sim, the bank officer, that this was why she wanted to place her money in a fixed deposit, so that she could fund her retirement. Mdm Wong only completed her primary education and was not fluent in English.
- Mdm Wong heard Mr Sim say that the fixed deposit interest rate was low and that she should consider putting her money into a "savings plan" instead. He said that if she could commit to saving at least S$300 per month for 5 years; she will receive a higher interest rate. Attracted by this, Mdm Wong decided to put her money in the plan suggested to her. She signed all the documents Mr Sim asked her to. When Mdm Wong received a call-back from the Bank Manager a few days later, she was in a hurry to take her husband to the doctor after a fall. She could not really understand what the Bank Manager was saying but responded positively to the questions asked of her.
- Mdm Wong dutifully paid S$300 per month for a year, but in the second year, after meeting up with an old friend who was also a financial advisor, Mdm Wong discovered that the "savings plan" she thought she had was an insurance policy that had a term of 15 years. She went to the Bank and asked that the policy be cancelled, and a refund given to her. She claimed that Mr Sim did not tell her that she was purchasing an insurance policy or that she would only be able to get her money back after 15 years. If she had known, she would not have agreed to purchase the insurance policy. The Bank suggested that Mdm Wong could surrender the policy but told her that the surrender value would be much less than the premiums paid for the policy. Dissatisfied, Mdm Wong came to FIDReC.

- During the mediation, the Bank told Mdm Wong that their investigations showed that Mr Sim had explained and disclosed the features and risks of the policy to Mdm Wong. Mr Sim had also confirmed that he told Mdm Wong about the policy term of 15 years and premium payment term of 5 years. Mdm Wong, with the help of her son who acted as her nominee, pointed out to the Bank that there were errors in the documents that Mr Sim had submitted on her behalf. The information did not match with her circumstances. There were also inconsistencies in Mr Sim's account. Mdm Wong argued that the policy was not suitable for her as she had made clear that she needed the money for her retirement in 5 years.

- The FIDReC case manager helped to facilitate the discussions and encouraged the Bank as well as Mdm Wong to consider a settlement that could help everyone move forward. In the end, with the agreement of the Bank and the cooperation from the insurer, Mdm Wong converted her policy into one with a shorter policy term (from 15 years to 10 years) so that she could access the funds she needed earlier.

Key Learning Points

- When dealing with selected clients, the Monetary Authority of Singapore requires financial institutions to have controls to check that its representatives have followed through the prescribed advisory and sales process before a transaction is submitted to the product manufacturer for processing. This process is meant to protect vulnerable clients, so do take any call-backs seriously and answer questions accurately.

- Do ensure that you read and understand any document before you sign it. You can always ask a trusted person to help explain the document to you before you sign it.

- Mediation is a process that can help both parties effectively resolve a dispute. When a dispute arises, there are naturally a lot of emotions and feelings of unhappiness. Do try to think objectively about your case and keep an open mind. You will then be able to make the best decision for yourself as to how and when to resolve the case.

- After you have signed the documents to purchase an insurance product, do note that there is usually a free-look period of 14 days. You can change your mind within this time but do notify the insurance company quickly.