Tokenization and its application in different countries

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Abstract

Our life is affected by technology deeply, each upgrade in technology can affect our expectations and behaviors. They cause massive differences between decades, which makes them the most momentous and vital objects in the future of almost everything. In recent years, one of the most game changer is the combination of smart contracts, artificial intelligence, the internet of things, and blockchain. They unlock enormous possibilities in data processing and scoring, project management, estimation methods, and more importantly to investment management. There always have been some big bangs that make a new megatrend in our lives, and now, a new trend in our financial lives is developing by tokenization, and all of those new methods can make tokenization more accessible. as Castillo Ionov said: "tokenization involves taking an asset and, using blockchain technology, issuing tokens representative of that asset, facilitating its negotiation, the enjoyment of the rights of that asset and its governance". tokenization help different kinds of investment to be more liquid, fast, transparent, immutable, efficient and cheaper. It also has its challenges such as technology risk, Cybersecurity, specialists, and at the top, regulatory principles. But there's a variety of approaches to face tokenization. Different countries take advantage of it in their way. Some of them use it to boost their economic efficiency by designing a suitable regulatory framework. Some use it to better observe markets by more strict rules.

In this article, we discuss tokenization, its process, benefits and challenges, and case studies around the world compared with Iran to see the difference in usage and regulatory framework.

Keywords: benefits of tokenization, asset-backed token, smart contract, challenges of asset tokenization

1 Introduction

Blockchain technology got noticeable eminence through the launch of bitcoin, with the execution of smart contracts and artificial intelligence can have a massive influence on the fintech industry and begin a revolutionary era. It opens new opportunities for payment and financing instruments that can have a massive impact on investment diversification and eventually wealth distribution. One of these opportunities is asset tokenization, which brings all tangible or intangible assets rights to digital tokens in the blockchain industry. The blockchain tokenization trend has been beginning since 2018, the core competency is everything can be tokenized, diamonds, fine arts, real estates, businesses, and so on.

the token has different types, one of the most beneficial types is utility token which is used about to consumption of company services or products, the other offers a share of the company and its future profits that named equity tokens or referred to as a security token offering (STO), the third type is the payment instrument which referred as cryptocurrency.

the importance of tokenization comes from the fact that through Q2 2018, ICO projects raised an overall volume of $7.5 billion (Long 2018), which amazingly is 45% of the total value raised by the U.S. IPO market ($16.0 billion), or 31% of the amount raised by the U.S. VC markets ($23 billion) in exact time, reported by CB Insights (2018) and PricewaterhouseCoopers (Thomson 2018)

This article enounces types of tokenization, steps to asset tokenization, its benefits, and challenges, case studies around the world.

2 Blockchain

Blockchain is a type of data for collecting information and is referred to as distributed ledger technology sometimes, which constructed the precedent of a digital asset immutable and transparent via decentralization and cryptographic hashing. It is named after the way it stored data. Information hold in the blocks linked by chains to gather. Blockchain can be consumed as a repetitive spreadsheet across a universal network of computers and update in an orderly.

The central concept of blockchain, decentralization, is an

outcome of a verity that the system forms of a universal peer-to-peer network and hence multiple locations stored the monad information, so it certifies that the data is verifiable and public. One of the consequences is that the information on the blockchain is hard to wreck. It is not impossible but needs a massive amount of computer power to reclaim the recordings.

Each block subtends transactions a date affixed to them, identification of the account which did the recording by a digital signature, and a unique identification link which will point to the previous block n the chain for ensuring that information is unalterable.

3 Tokenization

Smart contracts light up new insights to investment, commercialization, acquisition, transmissibility, and circulation of rights about various kinds of assets. blockchain provides detectability and coherence quality for data that make worldwide opportunities. (Del Castillo, 2018)

Straight forward, a token is a digital delegation of an asset or service on blockchain. They could be digital or physical in addition to tangible or intangible. Technically a token is an algorithm that accomplishes a base, such as smart contracts on a blockchain. It contains a list of all owners and their balance.

An organization could have done tokenization to provide users interaction and divide rewards mechanism through a network of token holders in the context of a peculiar business model.

Token application for physical objects makes the proprietorship more clarified (Gar2018). Furthermore, tokenization makes illiquid asset investments available by division assets into small units.

In a nutshell, a token is a formed unit of value that is established by an organization. In the concept of the crypto industry, we can add facts up to being community accepted and based on blockchain.

Token has some features like value, the number of tokens created, accepted denomination, the name and address they can use the token under it, and all of these are defined by the algorithm.

There is a difference between cryptocurrency and token. Cryptos operate on their platform apart from others, but the token is a crypto-based on an existing blockchain.

3.1 Types of tokenization

- Payment Tokens: the class of tokens which has the exchanging character and are being used as currency.
- Utility Token: these tokens have much more functionality than payments token. Utility tokens do have value, but can't be used as coins directly. They provide access to a specific service or product preferential treatment for owners. For instance, Uber tokens can be used for Uber payments but if owners want to use them for any other payments they should first change them to base coins like bitcoin and then spend it.
- Asset or Security Tokens: security tokens are a kind of derivatives. They present the value of an exterior tradable asset. For example, real state or gold. This class of tokens is designed to digitalize investment. For example, if someone has the stock-backed token, he or she has all the right as any other shareholder does. It works contrariwise of utility token and exposes investment. (Köse, 2020)

3.2 Types of asset-backed tokens

There are mainly two types of real asset tokens: equity tokens and dividend tokens. (Choosing one is related to business model) This classification is considered more by regulatory for observing how tokens will sell and who will buy them. It may ask for stricter regulatory criteria from issuers.

- Equity token: Investing in equity tokens is like the traditional shareholding of a company. In this type of token value, gaining occurs while the base assets, value increases.
- Dividend tokens: Profit-sharing token claims to divide a nominative percentage of total increases of base asset value. For example, in real state tokens, they can share an absolute percentage of the rental income of the real estate. The time and amount of profit-sharing for each token depends on terms and agreement. (Sazandrishvili, 2019)

3.3 Steps to asset tokenization

It may sound easy. Just "tokenize" your assets! But, of course, tokenization is much easier said than done. Below is a brief description of the steps necessary to accomplish asset tokenization.

1 Asset recognition: An abecedarian step in asset tokenization is asset cognition. All aspects that matter in the asset value such as ts essence, quantity should be completely specified.
2 Asset evaluation: the majority of assets should be assessed by an adequate position.

Appraisers or auditing firms take responsibility for this part. The valuation report will use in the white paper or at the core of marketing plans.

3 Tokenomics: after asset recognition and evaluation, the technicality of digital tokens will be considered. Any parameters such as the number of tokens considered for an issue, how new tokens will be a surcharge, what happens if some tokens won't be sold, and ... should be determined.
4 Smart contract setting up and audit: After these three steps, it goes to creating tokens throughout smart contracts progress. An obligation of smart contract expansion is picking up the particular digital ledger (blockchain) to sell tokens.

Any blockchain has specified features and requirements which should be chosen by the token type and asset nature. After the platform is chosen the smart-contract developer and auditor will get in touch. Smart contract audits can detect codings are a critical part of the process, because auditors can identify coding complications before the contract is extended. If a contract goes live on the blockchain there will be no reconstruct. (Sazandrishvili, 2019).

3.4 Bases of token

Tokens are constructed on a specific structure enclosed by a blockchain that traces the owner of tokens. The processes can be different. Have three kinds of token standards here:

Category	Description	Examples
UTXO-based	Uses a fragment of a native Blockchain asset as a container to which additional assets can be attached.	Colored Coins
layer-based	Uses metadata transactions and a separate transaction graph to create and track tokens.	Omni (Master Coin), Counterparty
smart contract-based	A dedicated smart contract creates and tracks states that represent token ownership. It maps tokens to current owner addresses.	ERC-20, ERC-223, ERC-721, ERC-1155, NEP5, NEP11, QRC-20

Figure 1. Token base standards

The most popular platform for tokenization is the Ethereum blockchain. Its open-source, decentralized, smart contract-based blockchain provides straightforward technical administration of tokens. (Roth, et al 2019)

4 Benefits of tokenization

4.1 Extenuation in transaction costs
PricewaterhouseCoopers (2012) claimed that the cost of IPO is near 15 to 22 percent of the total value transaction meanwhile the tokenization cost is less than 5 percent. And for unlisted real estate, the percentage is about 10 to 15 (Tokenestate, 2018) whereas trading tokenized real estate is not in charge of fees because of liquidity in the secondary market. Listed real state commission is different by volume, and it's about 0.2 percent up to 2 percent for each side (UBS, 2018) of the deal; meanwhile, this fee is from zero to 0.25 percent..

4.2 Preferable transparency
By increasing the quality and quantity of information about assets which is coming from the Internet of things devices, such as smart sensors we can have a better assessment of the value. Another hand, this assumption will improve the financial projection of projects, and making an optimized decision will help them to have better financing. All together these consequences will point to the blockchain era that is being a trust machine. (Tian, Y., Lu, Z., Adriaens, P. et al., 2020)

4.3 Boosted liquidity
Most of the asset doesn't have enough liquidity and the owner may have to wait for days or months to find a fair deal offer that can cost a lot and needs lots of process and documentary work. By asset tokenization and its secondary market everyone can sell or buy any asset in transient time and fewer fees possible. (Stein, 2018)

4.4 Fading out mediator's roles
Using blockchain fades the importance of intermediaries out. Trading directly sorts of cut all the financial, legal, and other intermediaries. (Sazandrishvili, 2019)

4.5 Immutability
blockchain structure for storing data makes them secure and transparent. In a way that if a player wants to modify any data, all the other miners would notice and will stop it.
So that any transaction information that confirms with a block formation is being unfeasible to modify or remove. (Sazandrishvili, 2019)

In the traditional capital market, most of the investments are out of the way, so many individuals can't make the interest of a varied range of assets to making their portfolio diverse. Tokenization brings small sizes of ownership which a wide range of investors can afford, so many potential sources get active on the market.

4.6 Enhanced transaction efficiency
The traditional secondary market of private equity can be time-killing, it may take weeks of the month to be complete, and the settlements won't be in the moment. Tokenized assets transaction will be done and settled in less than a minute, for example, Ethereum blockchain transaction will finish zero to 100 percent less than 27seconds. (Tian, Y., Lu, Z., Adriaens, P. et al., 2020)

5 Challenges

5.1 REGULATORY
One of the most critical challenges of technology is the lack of principle or absence of regulations. Many countries provide market operation obligations for cryptocurrency trading, but none of them has a complete solution.
In the absence of a regulatory, the massive potential of the asset-backed token is getting denied. The problem affects all the chains of this financial instrument, issuers, custodians, exchanges, and investors. The hard part is to find a way for these digital assets won't get devaluate face to traditional financial assets.

5.2 Business partners
Organizations which try to do tokenization have to find a professional team of legal consultant financial partners and technical developers who are specialist in blockchain, smart contracts, and digital tokens. The market will be overcome this challenge by getting mature and experienced. (Sazandrishvili, 2019)

5.3 Technology
There are massive possibilities of anything for assets under tokenization in the tangible world that affect the values and should reflect on blockchain mechanism. There is some solution, some of them are the winners and some not. But there is a long way to find a way to reflecting anything that matters on blockchain-based tokens. (Tian, Y., Lu, Z., Adriaens, P. et al., 2020).

5.4 Cybersecurity
Blockchain-based businesses are one of the most repetitive destinations of cyber attackers. The occurrence of cyber incidents pointed to stealing cryptocurrency in 2018 was 100 times and around 2 million USD worth. (Blockchain Graveyard, n.d.). We have two layers' taxonomy of blockchain attacks, data or network layer, which is the low-level attack and the higher level is concerned consensus and smart contract. (Sazandrishvili, 2019)

5.5 shariah complexity about tokenization
The finance industry has always been flexible and open to new technology and upgraded itself consistently to the newest transformations. (Yermack, 2017). Blockchain helps Sukuk in

enhancing efficiency, cost-cutting, increase transparency and for as much as Sukuk had been an infinite potential for business fundraising, there would be a greater collaboration but has some challenges such as the slow process of Sukuk, shariah scholar decisions, deficiency of standardization, conflict among shariah standards and globally accepted structures. (Khan et al, 2020)

6 Cases around the world

6.1 Brick blocks
This platform provides dividends from rental income and interest and capital distribution by tokenizing real state around 2 million dollars in Wiesbaden, Germany

6.2 Car park in Ljubljana
Blacksquer Company had a project about the tokenization of parking in the capital of Slovenia; there are 19 investors from 8 countries who share the ownership of the parking and receiving the rental dividend of it.

6.3 Realfund
The first company for real state tokenization in Spain. They tokenize real estate projects to different types of assets (equity, debt, liquid investment) on the blockchain with next-generation smart contracts and help projects financing by crowdlending.

6.4 La Tahona
La Tahona is a startup that decides to finance its portfolio projects by issuing an asset-backed token for attracting a variety range of investors. Its investments are mainly in gated community real state in (Uruguay).

6.5 Sirin labs
Is a startup in smartphones and other types of software and hardware business in Switzerland, raised out 150 million dollars through its ICO by offering Sirin token. This token has purchasing power for Sirin and its ecosystem products or can be traded in the secondary market. The Honey pod is a similar case that executes in the hardware business and provides traffic filtering.

6.6 Banana coin
Banana coin, which vegetates banana in Laos, is a decentralized cryptocurrency that can use for selling, exchange, and crowd sales.

6.7 Token state
This company provides a platform to companies and real estate asset managers for issuing and managing their blockchain-based securities. Whereas another asset has the same properties as real estate, the platform can quickly get adopted for different asset tokenization.

6.8 Smart Valor
The mission is so pure; Smart Valor tries to bring equalization and democratization to the investment industry and make an accessible way to wealth. Regularly there are some specific individuals and institution which can afford alternative investment such as venture capital, private equity, hedge funds, real estate and commodities.

But smart valor enables the possibility of these kinds of investment for anybody by offering a decentralized tokenization marketplace.

6.9 Mt Pelerin
Quiet complete regulated bank in Switzerland base on blockchain that tokenized its balance sheets and all the token owners behave like regular shareholders

6.10 SwissRealCoin (SRC)
Crypto Real Estate Ltd issued a perpetual subordinated non-interest-bearing bond which has voting rights linked to a portfolio of Switzerland commercial real estate, it's a security token with the goal of automation of real estate asset management.

7 Tokenization in Iran
7.1 Abpars
It's a kind of utility-security token. The token gives all shareholders rights of the water desalination company in the Oman sea region besides the priority to the usage of the product in the location of the project(Chabahar) to the holders.

7.2 KAT1
Kuknos academy is the educational executive subordinate of the Iranian blockchain company that established its token that makes it possible to purchase all the content academy produce and tickets of events directly.

7.3 Diamond
A diamond-backed token. Every 586 tokens represent G color round cut VS2 clarity 1.01-carat diamond. It is possible to pick up the diamond by giving tokens to the issuer.

7.4 Peyman
A gold-backed token which represents 0.001gr 24 carats fine gold and its liquidity is guaranteed by issuers. This token is used for the facilitation of other tokens transactions and inside network fees, but it doesn't have any payment function.

7.5 GANJMAN
The National Library and Archives of Iran, the mission is to prevent regression of valuable, exquisite, and linear documents from the country and gradual destruction of them by declaring the financial value of this heritage besides their spirituality. Some of these have the people and don't get necessity consideration. So the NLA decides to establish a token by charity crowdfunding method to execute its mission by buying those documents to Participate in documentaries for preservation at the National Library.

8 Regulatory
One of the biggest matters in financial markets is a trust issue. From the beginning regulatory made up for organizing the markets and make them a safe and trustworthy place to perform at.

Nowadays, regulatory uncertainty is one of the biggest barriers to scaling tokenization up. Regulatory makes investors sure about consistency, integrity, stability, and investor protection on the tokenized market. Here is some regulatory attitude about tokenization in different countries.

8.1 Switzerland

Switzerland made Switzerland's federal government and the Swiss Financial Market Supervisory Authority (FINMA) in charge of regulation about STOs and ICOs. They classified tokens in three categories as we said and have a positive and flexible attitude about them.

FINMA consider asset-backed token as securities and have been observed under Swiss financial market law supervision. (FINMA, 2018).

As security token offering is an exemplar of tokens it should touch FINMA's published guidelines requirements. STOs obligations must be to the "Big Five" Swiss Banking Regulations, the Stock Exchange Regulation Act, the Anti-Money Laundering (AML) Regulations, Banking Regulations, Financial Market Infrastructure Regulations, and Collective Investment Scheme Regulations.

8.2 Spain

Spain's government faced the fact that tokenization can't befit the previous laws. They foresighted that if there will be any securities which didn't mention in book entries or securities, are considered to be negotiable on the text of article 6.1 of Royal Decree 4/2015 of 23 October. About asset tokenization the National Securities

Market Commission recognized tokenization but made them be registered as a trading center (as a regulated market SMN or SOC) or as an investment service company (ESI) to be supervised by the National Securities Market Commission. As a result rules on public offer of securities will be feasible to the tokenization of properties (Del Castillo., 2018) and tokenization became legal and regulated.

8.3 Argentina

concerning the National Civil and Commercial Code article 1820 recognized securitization by anybody in the law and the fact that country needs to adopt various types of financing instrument for development (such as crowdfunding) Argentina assent to the General Resolution 717-E/2017 of the National Securities Commission (CNV) which establishes that the Collective Financing Platforms ("PFC") are legal entities form as corporations, authorized to operate as PFC registered by the Commission. By this, a legal outline for commercializing tokenization is created.

8.4 Iran

Iran central bank categorized token into 4 sections, Rial-backed token, currency-backed token, gold, and other precious metals-backed token and other tangible or intangible-backed tokens. They make restriction legislation against non-institutional issuers. For instance, the central bank has the monopoly on issuing a rial-backed and currency-backed token, and it is possible to trade them just under the supervisory of the central bank or other regulated banks and exchanges. By way, the only token which is capable of performing as a payment instrument is a Rial-backed token. Although the central bank and other regulated banks have a monopoly on establishing currency-backed tokens. Gold and precious metals- backed tokens issuing need central bank authorization and to be regulated by banks guarantee.

Tokenization of other tangible or intangible assets are under securities and exchange organization and can be traded at commodity bourse or as securities.

9 Final words

Over the years, technology has deeply affected our macrocosm, economy, our lives, and recognized as a revolutionary element.it created remarkable tools, resources, and information to be used. Digital transformation reorganized economical relationships such as customers, workers, investors, and lenders. Forasmuch productivity is acknowledged as the main rotor of economy, Technology innovation enables the more dynamic, effective, less competitive market to play a role. Contrary to this mission technological frontier firms obtain massive productivity gains, but there weren't equal to small firms or individuals up to the last few years. Contrary to this mission technological frontier firms obtain massive productivity gains, but there weren't equal to small firms or individuals up to the last few years. But in recent years, specifically in investment decisions, technological advances have been made revolutionary waves about diversification and increasing profitability, and decreasing investment costs. Technology is radically changing expectations, behaviour, and accordingly decision-making in investment.

Today's new trend in technology is moving forward around AI, Blockchain, IoT, and Smart contracts. There was always a big gap between the digital and physical worlds that these technologies will fill this void by combination each other as tokenization. Tokenization also helps transaction costs reduction, increasing transparency, liquidity and Immutability all together will enhance the efficiency of transaction and investing process.

As we mentioned, there is a variety of tokens, most of which is an asset-backed token that helps to finance different projects and activities of any type of companies which ultimately will increase economic productivity. Countries help to escalate the productivity of their economy by facilitating issuing and trading tokens, as well as enhancing the internationalization of their economy and capacities. However, in Iran, the strict restrictive laws originated the fact that the main share of tokens is utility tokens. As a result, its advantages haven't been enabled.

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