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Moving to a token-driven economy

Enabling the digitization of real-world assets

IBM Institute for Business Value

Unlocking assets

Today, it takes one click to buy an airline ticket or a new sweater, but if you want to buy stocks or get a mortgage, transactions are more time intensive. Whether it's waiting for documents or settlement, many types of transactions aren't instant. Assets like gold, real estate, fine art or carbon credits are more difficult to transfer, often obligating buyers and sellers to contend with mountains of paperwork and lengthy procedures. By representing physical assets as digital tokens on a distributed digital ledger or blockchain, it's possible to unlock the value of real-world assets and to exchange them in real time.

Accelerating the exchange of value

Today's cross-border payment processes are fraught with time delays, complexity and inefficiencies. Payments are the backbone of global commerce, but payment in real time has yet to be achieved. Whether it's payments or other asset classes, the ability to move real-world assets onto a blockchain offers the advantages of a secure digital platform, while retaining the characteristics of the asset.

Securitization is the process through which contractual obligations such as mortgages, car loans, personal debt or receivables are pooled, and their cash flows are sold as standard units to investors. Since the early 1970s this process has become more common and broadly applied. But "tokenization" goes one step further. Instead of restructuring cash flows like securitization, it monetizes the "right to use."

Digitization of assets is a process in which the rights to an asset are converted into a digital token on a blockchain. Ownership rights are transmitted and traded on a digital platform, and the real-world assets on the blockchain are represented by digital tokens. The transparency of blockchain combined with the convenience of transacting tokens can make previously illiquid asset classes more accessible and attractive.

Many types of financial assets are already digital, such as when cash is represented as numbers on a screen. But tokens enable certain assets to move swiftly across digital platforms or networks. Opportunities for cross-border trade increase as geographic barriers are removed. Tokenization can unlock new markets for previously frozen, underutilized or illiquid assets and offers possibilities for new types of fractional ownership.

Tokens in real estate

Global real estate value was recently estimated at USD 217 trillion.¹ In real estate, token ownership can be used to give the holder a portion of the rights to a physical property.

Unlike a traditional real estate transaction, the asset can be subdivided into numerous fractions or tokens, which might then be offered for sale. A purchaser receives benefits from the asset such as rental income and proceeds if the physical property is sold. By using tokens, a relatively illiquid property becomes highly liquid with minimal friction in buying and selling.

Token-based economy opportunities and challenges

Token-based assets are rapidly gaining widespread acceptance. The initial coin offering (ICO) market is a case in point. This new method of crowdfunding recently broke the USD 4 billion barrier globally.² ICOs involve the creation and sale of cryptocurrency or tokens to fund projects. With an ICO, a project has a viable alternative to the traditional routes of obtaining money through banks or venture capitalists, which typically involve a lot of time and some sharing of control.

ICOs also bypass the limits of traditional crowdfunding by introducing a secondary market to their funders. This secondary market is why, despite ICOs generally being considered high-risk ventures, many people are willing to take the chance in the hopes of large payoffs later.

Digital currencies are another area that has grown quickly. Recently, Sweden has begun looking into creating a new form of money

called a central-bank digital currency (CBDC). The goal is to complement electronic payment modes from commercial entities with a state-sponsored solution that is as inclusive and ubiquitous as traditional banknotes and coins used to be.

In Sweden, so few people conduct transactions with cash that many of the country's banks don't offer over-the-counter cash transactions anymore.³ Although officials admit it's not yet feasible and perhaps not advisable to go to a completely cashless society due to lack of monetary policy, it's becoming clear that producing, distributing, handling and replacing banknotes and coins is expensive. These physical forms of money also aren't trackable and can be subject to counterfeit and fraud. A well-designed CBDC solution moves toward addressing these issues.

Of course, fraud and extreme volatility are some of the concerns surrounding the token-driven economy as well, and the applicability to ICOs and tokens of certain securities and similar regulations is unclear. Some ICOs have been suspended because they were deemed to constitute illegal distributions of unregistered securities.

Because today's cryptocurrency exchanges operate without registering with regulators, participants don't currently benefit from the safeguards of a regulated stock exchange. For example, on a stock exchange, you're not allowed to trade with yourself because it's considered price manipulation. Yet this type of trading happens regularly on Bitcoin exchanges.⁴

Critical success factors

Because of the security and fraud risks, enterprises have focused mainly on private, or closed, blockchains where participation is limited to known, trusted parties. At the other end of the spectrum are completely permissionless public blockchains like Bitcoin that are centered on cryptocurrency. Anyone with a computer can join and the participants are typically unknown.

However, the ability to exchange an asset for something else is achievable in public markets and makes tokens significantly more valuable. Security is vital to the success of a token-based economy, which is why there's a need for a hybrid approach: a public but permissioned blockchain.

In this scenario, users can freely join the network, but must obtain permission or be verified to participate in the validation of transactions. Once they join, they receive a key to get in. Security-wise, it's similar to a full-trust network, but with the accessibility and advantages of a public network. The goal is to bring enterprise capabilities, security, scalability, permissioned constructs and strong identity management to public networks where assets can live and move more freely.

Regulatory and government approval is another key to success. The potential of a token-driven economy can only be realized if it gains regulatory and government acceptance.

Tokens transform energy markets

Making carbon credits easier to use is a great example of how blockchain can transform existing markets. Carbon credits enable organizations to reduce their greenhouse gas emissions by paying third parties to create carbon emissions reductions.

But the process of measuring those emissions throughout a complex supply chain is confusing and costly. Purchasing these financial instruments is equally complex. These barriers leave companies at odds with regulators, institutional investors and consumers, all of whom are demanding companies improve their social and environmental governance.

Veridium is working with IBM to help transform the cumbersome carbon credits into a new type of fungible digital asset that can be exchanged or traded with less friction.⁵ By integrating the entire process of carbon accounting and offsetting in a token on a public, permissioned blockchain network, ownership rights can be transmitted and traded more easily.

Tokens in emerging markets

Entrepreneurs in emerging markets often have more difficulty in obtaining capital funding than their counterparts in developed markets. In most emerging markets, it's expensive, slow and inefficient to incorporate and manage a corporate structure. Economist Hernando DeSoto estimates that up to USD 20 trillion of capital owned by the world's poor is non-fungible due to lack of quality institutions.⁶

By turning citizens in the world's poorest countries into recycling entrepreneurs, The Plastic Bank aims both to lift millions out of poverty across the globe and clean up the ocean. Much of the plastic originates in underdeveloped countries with minimal waste management infrastructure where citizens often survive on less than a dollar a day. The Plastic Bank worked with IBM and service provider Cognition Foundry to develop a blockchain-powered token rewards and recycling incentivization system to turn plastic into a new kind of currency.⁷

Historically, regulatory entities and governments often have inhibited innovation due to institutional resistance to something new. Although these groups may intrinsically be inhibitors, their approval is vital. Including input from regulatory and government entities early on will allow them to better understand the advantages of asset digitization, and so become part of the solution.

Any time new channels are introduced for commerce, they almost always become a potential vehicle for laundering money. This is especially true in the early days, when platforms are less mature, have not evolved potential security controls and are not yet fully regulated. Many of the same benefits of cryptocurrency, such as the privacy, openness and streamlined exchange of value, also could make it a fitting vehicle for illegal movement of money. As these vehicles become more widely adopted and mainstream, it will be critical that the

appropriate anti-money laundering and financial crime controls are put in place to enable them to become a mainstream, more widely accepted method for value exchange and money movement.

Privacy is another critical success factor. On digital exchanges, zero knowledge proofs (ZKP) are a powerful way to confirm that what is private remains private.⁸

At a high level, ZKP is used to prove that something is true without revealing any further information. ZKP can be used in environments where privacy and confidentiality are critical. For example, suppose an employee takes a drug test. With ZKP, the employer could receive only the pass-fail result of the test without any other data about the employee, such as medical history. In the context of token-based assets, ZKP brings a new level of security. Payments and exchanges are happening, but extra details about transactions can remain private and confidential.

The move to token-based assets

Token-based assets have the potential to open up markets and offer new opportunities because of the decentralized nature of blockchain. Much like the internet 25 years ago, a steady progression of innovation can arise from a real-time, interconnected world with the potential to sequentially and substantially disrupt markets.

Putting real-world assets into digital form using tokens so they can be exchanged easily and without friction promises to be disruptive. Between now and 2021, we expect the blockchain opportunity for providers of blockchain platforms, services and owners of blockchain networks to grow five to ten times greater with a significant portion of this opportunity in the digital token economy.⁹ Industries will reinvent themselves, and new digital assets and asset classes will give rise to entirely new primary and secondary markets with low cost and minimal friction.

These changes are expected to reshape global economies, empower underserved markets, and usher in a new era of global commerce. Imagine 15 years from now, the possible impact of a token-based economy on societies around the world.

Consider these questions:

- What problems exist in how your assets are traded or transferred today?
- How can your solution enable trusted data to be shared across multiple parties?
- What benefits or efficiencies can you gain through transferability without a central intermediary authority?
- How can you aim for greater privacy and trust among members of your current business network?
- In what ways can you quantify the value associated with making transactions settle faster, such as reduced counterparty risk, reduced settlement risk or balance sheet exposure?

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Armonk, NY 10504
Produced in the United States of America
May 2018

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