



DIGITAL TRANSFORMATION WITH DIGITAL ASSETS - TOKENISATION AND MANAGEMENT BY TECHNOLOGY DRIVEN PROCESSES



CMA (Dr.) Paritosh Basu

Senior Professor
NMIMS School of Business Management
Mumbai
paritosh.basu@sbm.nmims.edu

Introduction

A fusion of definitions of assets provided by different economists reveals that an asset is a store of value, owned by an individual, a firm, or a government entity. Such assets can generate more values or be converted into another form of asset that also can fetch value from market, e. g., inventory of raw materials. The new value so created can be measured in tangible and/or subjectively judged in intangible terms. Some definitions also cover a group of assets which can jointly generate values like a manufacturing plant. In

accounting parlance such a combination is known as a cash generating unit (CGU).

It is easy to appreciate those assets which yield values that are measurable in tangible terms, e. g., the sale value of a product of any nature produced by one or a group of machines. An example of a physical asset yielding intangible benefits could be a laptop computer used by a person for day-to-day work, the output of which may not be possible to be measured in terms of money in most situations. Even a thermometer for measuring human body temperature can also be considered as an asset, albeit of a smaller tangible value for selling. However, the benefit it renders by its ability to read temperature that helps a doctor to diagnose ailment and decide about the course of treatment cannot be measured.

The economic definition of an asset provides the conceptual framework for financial accountants to define assets of further two more categories, viz., intangible assets and financial assets. Intangible assets comprise of the non-physical group of assets which has abilities to create value. For example, registered patent rights granted for innovations, invention or 'innovations', e. g., medical drugs, product designs, new metal alloys, software, etc. which give a person or a firm exclusive right for generating saleable products or render services by using the right without being imitated by others. But a painting, created

Image Source:

<https://www.sapiencie.digital/2020/08/15/digital-asset-management-7-imperative-lessons-of-the-digital-transformation/>

by an artist of eminence, cannot be sold to more than one person if he wants to monetise it and essentially to be sold through a traditional auction type process.

A financial asset is that store of value(s) for an identified person or a firm, which are legally defined and valid documents. This gives right to receive cashflows at predefined points of time as incomes and/or realisation of dues/principal sum that was initially invested or lent by the owner to acquire those financial rights. Cases in point are equity shares, bonds, debentures, units of a mutual fund, receivables against sales, etc. In the new age digital economy, the question that needs to be addressed is whether any creative work of an artist can be converted to a store of value and thus an investible asset. Or whether the owner of a large real estate can partly monetise its value without physically parting with it.

There are different institutional frameworks, popularly known as valuation standards, promulgated by legally recognised institutions, lay down globally and nationally acceptable methods for determining values of all these types of assets. Accounting standards also provide guidelines to categorise such assets into further two groups viz., current, and non-current in terms of period of holding, and suggest methods for valuation, accounting, and reporting.

Readers by now must have become impatient, and rightly so, with such a long introduction on assets. However, they might have guessed that in the light of the above narratives, one would be able to understand and appreciate the emerging group of new asset class called 'Digital Assets' (DA). The present Industry 4.0 era has so far twice been devastated by black swan like events, viz., global financial crisis of 2008 and Covid-19 pandemic which accelerated the pace in applications of digital technologies by blooming of startups, soonicorns and unicorns.

Both traditional and non-traditional business entities across industry sectors are continuously being disrupted, 'destrupted' and 'bizrupted' by innovative applications of eight deep digital technologies.

People are also being made to live life in a different way remaining under the influence and drawing help from internet driven and digital technology-based devices like smart phones, Apps, IoTs, IoBs, and so on. If that be so, why it should not be possible to solve problems of those talented professionals whose creations are not protected, monetised for the financial value it deserves and made available for wider ownership? Why not also give general investors bouquets of 'Digital Assets' (DA) with options for large and small values?

Objective

Zillions of bites have by now been consumed in cyberspace by digital scientists, digital evangelists, commentators, crypto-enthusiasts, finance, and investment professionals while writing about DAs and non-fungible tokens (NFTs). Research and study of a few of those writings reveals that there is a perceptible emerging trend in creating, offering and adoption of DAs and NFTs by investors in new age digital economy. This paper has been written with the major objective of bringing out various aspects of these two groups of assets so that one can get some fundamental knowledge or bridge gaps in that, if there be any. This will be done in the context of emerging ecosystem collectively comprising of digital technologies, tokenisation process, markets for digital assets, directional guidance of regulators, and so on. It would also briefly narrate some projections about size of investments and likely number of investors in next about four years at global level for digital assets.

Digital Assets – Definition and

Demystification

The simple way to define a digital asset is to borrow the features of an asset from the above orthodox definition of an asset and then superimpose the enabling features attributed by digital technologies. Hence the definition can be, crafted as a store of value which is created, acquired, stored, allocated, transferred transcending any geographical and even sovereign boundaries, administered, valued, and finally encashed against fiat currency by digitally designed systems and processes. According to Gartner Glossary¹ "A digital asset is anything that is stored digitally and is uniquely identifiable that organizations can use to realize value. Examples of digital assets include documents, audio, videos, logos, slide presentations, spread sheets and websites".

Professor Wufu A Kaal², has defined digital Assets with both broad and narrow perspectives. "Narrowly construed, digital assets are instantiated through computer code and depend on so-called consensus computer algorithms to trigger and validate a transaction... Broadly construed, digital assets can include virtual assets such as video games Digital assets cover all types of virtual and electronic assets, including cryptocurrencies, virtual assets, virtual collectibles"

Digital assets as a theoretical phenomenon came to public knowledge when Satoshi Nakamoto published his white paper on peer-to-peer network for electronic cash system in 2008, albeit the controversial issues of his identity are remaining unresolved. His primary objective was to liberate currency management from the clutches of central regulatory agency of any country. It came to reality immediately in the next year when he and his team implemented the same using blockchain technology for Bitcoin, which is a tokenised store of value yet not backed by any

guarantee or collateral. The rest is history now. Readers may know about it from the author’s paper published under this column in February 2021 on cryptocurrency and central bank digital currency³.

It would be useful here to study the definition of DAs as contained in the newly introduced section 47(A) under the Income Tax Act, 1961 of India by the Finance Act 2022-23. This new section, before defining a DA has added the word virtual and recognised it as a VDA or a virtual digital asset. This is rightly so because such an asset can never exist in any physical form whatsoever. The definition of VDAs has been provided in an inclusive manner which can effectively be analysed into the following components of features of a VDA:

- ⦿ VDAs are categories of virtual digital assets, viz., any information or code or number or token which is not an Indian or a foreign fiat currency,
- ⦿ The condition attached is that such assets must have to be “generated through

cryptographic means or otherwise by whatever name called”,

- ⦿ The VDA so generated must provide a “digital representation of value exchanged with or without consideration”,
- ⦿ There must be a guarantee or a demonstration of a VDA having an innate value or it must have the attributes of a store of value or a unit which can facilitate exchange of ownership in the form of a financial transaction and accounting thereof, and
- ⦿ It should be possible to store, trade and transfer VDAs electronically.

The above definition of VDAs has further been widened by adding two more points, viz.:

- ⦿ The definition of a VDA will not remain limited to any investment scheme, and
- ⦿ It would include non-fungible tokens (NFT) or any other token of similar nature,

The Act has kept the horizon open expandable by empowering the Central Government of India to declare any other asset in digital form as a VDA which might have not been covered by the above definitional attributes of a VDA or can be excluded from the clutch of this definition of a VDA

Readers may first discount some of the typical and legal adages that has been added to this definition with the objective to enable the government to ensure that there is no loss of revenue that can be charged and collected from dealings on VDAs. Having done that, readers would get from the above a wide-open definition of digital assets and their characteristic features which are not different from any other type of assets narrated in the introduction. The following is an example of a set of DAs in the form of digital contents which are used for websites, business communications, marketing campaigns, etc for an entity and cannot be imitated by anybody else. Lately jingles and musical tunes are also included as copyrightable digital assets.



Source: <https://openasset.com/blog/what-are-digital-assets/>

Therefore, DAs can be based on anything ranging from a painting to a video, sculpture, music, song, etc. and even physical assets. Such assets are unique, one of its kind and not replaceable. The ownerships of such DAs are recorded and stored in a digital ledger called Blockchain which essentially is a decentralised technology providing trust, transparency, safety, and security. Owners of DAs do not own

or possess anything in physical form. A shareholder of any listed company also does not own or possess anything in physical form and receives a soft statement of his holdings and values at periodical intervals from the designated custodian. The differentiating feature of this from a DA is that records for equity shares are not maintained in a P2P network created and maintained using blockchain technology. Moreover,

shares are traded in compliance with the related regulations of the Securities and Exchange Board of India (SEBI). Whereas in India there is no regulator for DAs yet.

Tokenisation of Assets

The above definitions of digital assets have included non-fungible tokens (NFTs) under digital assets group. It would, therefore, be useful to know more about NFTs. But

before that it would be helpful to reinforce understanding about what a token means and what tokenisation is. Oxford dictionary has provided two meanings of the word token, viz., “A thing serving as a visible or tangible representation of a fact, quality, feeling etc.”, and “A word or object conferring authority on or serving to authenticate the speaker or holder”. These two meanings can aptly be considered as essential attributes of any Digital Asset. Gartner Glossary⁵ defines tokenisation as “a process by which a piece of sensitive data, such as a credit card number, is replaced by a surrogate value known as a token. The sensitive data still generally needs to be stored securely at one centralized location for subsequent reference and requires strong protections around it.....”

Tokenisation is generally of two types, viz., frontend and backend. Frontend tokenisation takes place when a service provider creates the token of any sensitive information even before commencing service delivery through any internet based digital platform. Whereas backend tokenisation takes place when the token is created by any system only in the event there is a need for sharing any sensitive information. Providing

an Aadhaar Card to every citizen by the Unique Identification Authority of India is an example of frontend tokenisation⁶. It has introduced “.... two services for the Aadhaar unique ID system: (a) Virtual ID, and (b) UID token and limited KYC. Both features use tokenization to enhance the privacy and protection of Aadhaar holders’ personal data.”

In a simplistic sense, therefore, tokenisation is nothing but substitution of a sensitive or a set of sensitive information by an insensitive identifier that cannot be manipulated or duplicated with a mala fide intention because it does not have any extrinsic or gullible description. The question that will arise now how tokenisation is done for an asset which can be exchanged and/or traded?

Hereda⁶, one of the leaders in blockchain technology, has defined asset tokenisation as “... the process by which an issuer creates digital tokens on a distributed ledger or blockchain, which represent either digital or physical assets. Blockchain guarantees that once you buy tokens representing an asset, no single authority can erase or change your ownership”. Therefore, again on a simplistic sense, asset tokenisation is nothing but fractionalisation of an

asset into smallest units. Each unit represents a fractional part of the underlying asset’s intrinsic value, which can in course of time increase or decrease due to market dynamics or any other reasons.

For example, let it be assumed that there is an excellent artwork, say a painting, by a famous artist of global eminence, and he wants to monetise it. But he does not want to part with it because he expects its price to increase further. He fixes its price at INR 100 lakh keeping in view that the highest price bided for it in a recently held exhibition was INR. 95 lakh. He can approach a blockchain platform-based tokenisation service provider for creating 10 L tokens for the artwork with each token priced at INR. 10. He can then allow 50% those tokens to be traded through a token exchange for parting with 50% of its ownership to others retaining the balance with him. Each token thus become a Digital Asset representing a fractional value of the physical asset. Anybody from public can buy one or more tokens. In course of time when those tokens are traded, in the exchange the price of each token are likely to increase keeping in view the artistic value and rarity of that creation.



Source: <https://www.insights.sygnium.com/post/crypto-primer-what-are-cryptocurrencies>

The above picture graphically presents the landscape of tokenised assets of existing economy vis-à-vis the DAs of the new economy. The acronym STO on the bottom red block means security token offering like ICO meaning

initial coin offering. Newspaper reports reveal that certain startups in Europe are working on creating digital assets based on immovable real estate assets like land, building, commercial premises, roads bridges, etc. This will enable small investors to invest and participate in sharing value appreciations of such assets. They would also have options for splitting their investible surplus into several DAs like investors for equity share market.

Non-fungible Tokens

The joined word non-fungible has been defined by the Oxford Dictionary as something which is not replaceable by another identical item, or which is not mutually interchangeable with another item. Any fiat currency note is a token in the light of the meaning of the word token as stated in the previous section. But one INR 100 currency note, or a USD 10 bill are not non-fungible tokens. Because one such INR 100 currency note can be replaced by two INR 50 currency notes and one USD 10 bill can be replaced by two USD 5 bills. Readers might be aware that currency notes in the USA are termed as bills. Moreover, these currency notes are not administered through a Blockchain platform, and their exchange values guaranteed by the respective sovereign nation. Again, on a cross currency mode a USD 10 bill can also be replaced by INR currency notes representing equivalent value.

Extending the above meaning of the phrase 'non fungible' a Non-fungible Token (NFT) as a digital asset can characteristically be defined as a digital unit maintained, administered, and traded through a blockchain platform which identifies and represents the fractional ownership of a specific physical or digital asset, i. e., a store of value and cannot be replaced by any other token because the underlying store of values cannot be replaced by any

other asset. Essentially each NFT contains a digital identity by way of a digital signature which signifies its specific recognition and makes it tradeable only in the Blockchain platform which as offered it. Such a feature precludes this token to be replaced by any other token.

Therefore, pervasive understanding of a Digital Asset, the process of tokenisation, and features of a non-fungible token suggests that cryptocurrencies like Bitcoin or Ethereum are not NFTs as one can be replaced by equivalent market value of the other. Again, none of these represents a specific tangible, intangible, or a digital asset. However, the aforesaid example of one fractionalised unit of a specific artwork or a real estate property are typical examples of NFTs because the same cannot be replaced by any other token as there cannot be another token for the same artwork. Similarly, NFTs can be created for an intellectual property (IP). The registered creator and right holder of an IP while approaching for monetisation of his IP right through NFTs may provide license for full and or a limited part of his right to be monetised. Readers can know more about NFTs by visiting the webpage <https://www.gq.com/story/what-is-an-nft>.

Smart Technology for Smart DAs and NFTs - Blockchain

The world has already witnessed many successes in cerebral applications of Blockchain technology with distributed data storage management system (DDSM) by integration of cloud computing and edge computing. Blockchain has proved its potentials to be the powerhouse of Industry 4.0 era and a foundational technology for transforming economic and societal foundations of any country. Readers would recall writings on all these from the author's previous papers under this column.

Blockchain technology has already proved that it believes only in one

version of truth and can establish that this truth can be trusted by everyone because the technology is immutable, auditable on online basis with evidence stored in its digital library. It protects all data and transactional details by encrypting those with complex algorithms for cryptography. Cybercriminals would need a computer with supersonic speed to penetrate any blockchain based platform for hacking and demanding ransomware, because of its distributed storage system and unique applications of algorithms for encryption, which are extremely difficult to crack if not impossible

All DAs and NFTs have so far been created, maintained, and offered through blockchain platforms. This author is of strong conviction that blockchain is the smartest technology mankind has so far seen and experienced. Therefore, it can help proliferation of digital assets with all possible safety, security, and transparency, yet with ease of access and transactional operations.

Regulatory Scenario for DAs and NFTs

Reserve bank of India on May 18, 2020 has issued a set of Guidelines⁷ in the form of answers on frequently asked questions (FAQs) on tokens and tokenisation, which readers would find useful. Other than this and the newly inserted Section 47(A) of Income Tax Act 1961, the author does not have knowledge about any concrete regulatory promulgations regarding DAs and NFTs in India so far, albeit governments and regulatory authorities are actively working on the subject. Forbes⁹ has reported that certain countries of Europe, like Switzerland and Germany have become more agile in creating friendly regulatory environment in their country for proliferation of this new-age investment options in DAs and NFTs. They have already introduced several laws and regulations in recent past with the

objective to build a solid foundation for proliferation of digital assets.

The US Congress has mandated the Securities Exchange Commission to regulate a range of assets as

securities including DAs and NFTs. Interestingly various stakeholders of that country expect that their Courts of Law take into consideration realities and imperatives of new age

digital economy and the need for such investment products stepping beyond forms and giving importance to substance.



Source: <https://cointelegraph.com/cryptocurrency-regulation-for-beginners/the-regulatory-considerations-of-nfts-in-the-united-states>

But for regulators it would be a unique task to lay down regulations and monitor particularly keeping in view three types of digital assets namely Stablecoins, NFTs and Cryptocurrencies. Incidentally a Stablecoin is also a cryptocurrency that try to measure its market value linking with an external fiat currency like say USD. Readers can observe from the brief narratives provided in the above graphic that equivalent respective values of all the above three DAs in terms of fiat currency USD is the same at 500. Such a situation may arise in any country for any combination of different types of digital assets. The author would urge upon readers to visit the webpage of Cointelegraph, as quoted above, for more knowledge and information on the subject.

Reference can also be drawn from the promulgated ‘New Rules on Issuance, Offering Platforms, and Custody of Digital Assets’⁸ by the Securities Exchange Commission of Nigeria around the second week of May 2022 with the objective to regulate digital/virtual assets like Cryptocurrencies and NFTs.

It has brought into the net digital players like DA Offering platforms, custodians, virtual assets service providers, and DA exchanges which forcefully targets investors of that country.

Thought leaders have not ruled out possibilities of fraud, falsification, money laundering and new avenues cybercriminal activities around DAs and NFTs, Blockchain technology, because of its many inherent strengths and capabilities, can provide enormous support for smart, safe, secured and transparent management of all digital assets but regulations are indispensable. It will take some more time for law makers and regulators of even developed countries to settle down with appropriate definitions of a DAs NFTs. Meanwhile innovators of the world, investors and other stakeholders are going ahead with these new groups of assets. Therefore, it would now be useful to take a briefly look at what all are happening in the global market for DAs and NFTs.

Global Marketplace for DAs and NFTs

The world of opportunities for

DAs and NFTs are wide open and expanding almost every day as are reported through various media. Cryptocurrencies may finally establish itself as a risky asset class for investment instead of a widely adopted medium for settlement of transactions. DAs and NFTs seems to have a future to grow and stabilise in minds of investors as can be perceived from their entries into the mainstream and going trend of adoption. Roman Regelman, CEO of Asset Servicing and Head of Digital of Bank of New York Mellon Corporation¹⁰ is of the view that “*Digital assets are transforming the world and becoming increasingly mainstream in our financial ecosystem. At BNY Mellon, we are committed to leveraging centuries of trust and innovation in order to build a bridge to the future.*”

The website of BNY Mellon continues to write that, “*With the increasing relevance of digital assets clearly established, institutional demand for a global infrastructure to provide stability and safety is evident. Investors expect the same institutional level of service as in the traditional space.*” Possibilities may

not be ruled out that in course of time DAs and NFTs can even overtake cryptocurrencies as an asset class. However, such hypotheses would continue to remain for some year as subjects for further research, analyses, critical thinking, and regulators' nightmare. Much will depend upon further enrichment of technologies and capabilities and professional ethics of 'Digital Asset Managers' (DAMs) of future. It will be relevant to the context and worthwhile to note the following estimations and projections by Statista¹¹, a global market research organisation of eminence:

- ⊙ Revenue earning from DAs in 2022: USD 41.0 Bln.
- ⊙ Highest revenue on a worldwide comparison to be earned by the USA in 2022: USD 20.42 Bln.
- ⊙ Average earning of each user's from DAs as a segment in 2022: USD 126.80
- ⊙ CAGR of total revenue till 2026 would be 18.59% translating to a magnitude of USD 81.1 Bln.
- ⊙ Number of participants in the DA segment by 2026 would be: 429.78 Mln.

- ⊙ Increase in penetration of users to increase in 2026 as compared to 2022: From 4.3% to 5.5%.

The question that may be plaguing minds of netizens in India is what would happen in Indian DA and NFT spaces. Anaximander, the great Greek philosopher ".....postulated about the development of life from non-life and the evolutionary descent of man from animal. Charles Darwin simply brought something new to the old philosophy - a plausible mechanism called natural selection." India is at the cusp of such a Darwinian moment in the context of digital transformation. After decades of pervasive initial struggles India is fast transforming and evolving with all eight deep digital technologies. Indian startup ecosystem and congenial environment for entrepreneurship has helped achieving the pride of being the third largest home for Unicorns number of which has recently touched 100 and further being counted. Entrepreneurship is no longer considered to be a profession driven by only profit motive. Passion for innovation, zeal for solving problems of society and desire to share values thus generated with all stakeholders

have replaced that.

India is rightly not being considered homogeneous as a country when compared to its peers in BRICS or any other developed nations. This is because of many of its capabilities and attributes which has once again been proved by quickly coming back to the track of growth after Covid-19 pandemic. Indians must prove Darwin right once again in matters of plausibly selecting India as the new drive engine for global economy through innovative applications of digital technologies. One such proof has already been manifested to the world though its profound success in FinTech combining financial and technological ecosystems. India would certainly move ahead reaping stellar dividends from its young demography, passionate young entrepreneurs, widespread ITC ecosystem with deep rural penetration, large base of about 2.8 million IT/Digital systems developers, large number of netizens with eagerness to adopt and use technology, R&D efforts on 5G for telecommunication and so on. India has substantially advanced towards embarking on the journey for achieving Web 3.0, features of which has been presented in the following graphics.

Features of Web 3.0 in comparison to Web 1.0 and Web 2.0

	Web 1.0	Web 2.0	Web 3.0
INTERACTION	Read	Read-Write	Read-Write-Own
USER DATA	Cookies	3 rd Party Controlled	Portable and Personal
MEDIUM	Static Text	Interactive Content	Virtual Economies
ORGANIZATION	Companies	Platforms	Communities
INFRASTRUCTURE	Personals Computers	Cloud & Mobile	Blockchain Cloud
CONTROL	Centralized	Centralized	Decentralized
AD-SPENT	Page Views	Cost Per Click	User Engagement

Source: Adopted from Grayscale Metaverse Research Report

Source: <https://crosstower.com/wp-content/uploads/2021/12/Indias-1-Trillion-Digital-Asset-Opportunity.pdf>

NITI Aayog has published ‘Blockchain - The India Strategy’ in January 2020 and MeitY of Government of India has published the ‘National Strategy on Blockchain’ in December 2021. RBI has already charted out its path and initiated action steps for introducing CBDR. Resounding success in FinTech holds huge promises for more success in Decentralised Finance (DeFi), CBDC and NFTs. Moreover, overall economic growth would help investors from large middleclass group in exploring and allocating a part of their investible surplus for investing in these emerging DAs and NFTs.

The author is, therefore, not surprised to note views of Crosstower¹² expressed in one of their reports of December 2021 that, “... *A September 2021 report published by the National Association of Software and Services Companies (NASSCOM) found that the digital asset industry in India could add \$184 billion of economic value by 2030 and that the industry could employ several hundred thousand people in India over the same period. While this is an impressive amount, we believe the opportunity is much larger, and estimate the economic value to be conservatively \$1.1 trillion by 2032*”.

Conclusion

It is perhaps difficult for any author to cover such a vast subject related

to emerging investment options in this new age digital economy within the confines of a few pages of this column. Accounting and reporting of digital assets have also not been covered in this paper. The author is committed to write more on DAs and NFTs in his next attempt. Certain aspects of this subject deserve empirical research, e. g, preparedness of people in general to adopt DAs and NFTs as an asset class of choice, what percentage of their investible surplus they are ready to allocate for these assets, how far they know, believe, and can rely upon the capabilities of blockchain technology platforms for truthfully, safely and transparently dealing with such assets, etc.

Probably several research scholars may be working on this elsewhere in the world, which must be done in India also. It would be the pleasure and privilege of the author to participate in such research if some scholars come forward with a proposal. Meanwhile if this paper can bridge the gap, if there be any, in knowledge and appreciative understanding of readers of the subject, the author would consider his efforts have met success. **MA**

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Congratulations!!!

CMA (Dr.) S. Kumararajan has been conferred the Ph.D Degree in Business Administration by Department of Management Studies, Madurai Kamaraj University under the guidance of Dr. A Velanganni Joseph (Main Guide), Professor, Head & Chairperson, Department of Youth Welfare Studies, School of Youth Empowerment, Madurai Kamaraj University, Madurai and Dr. V Chinniah (Co Guide), Professor & Head & Chairperson (Retd), Department of Management Studies, School of Business Studies, Madurai Kamaraj University, Madurai on the topic “A STUDY ON FUNDS MANAGEMENT OF SELECTED PUBLIC SECTOR BANKS IN INDIA”.

We wish CMA (Dr.) S. Kumararajan the very best for all of his future endeavours.