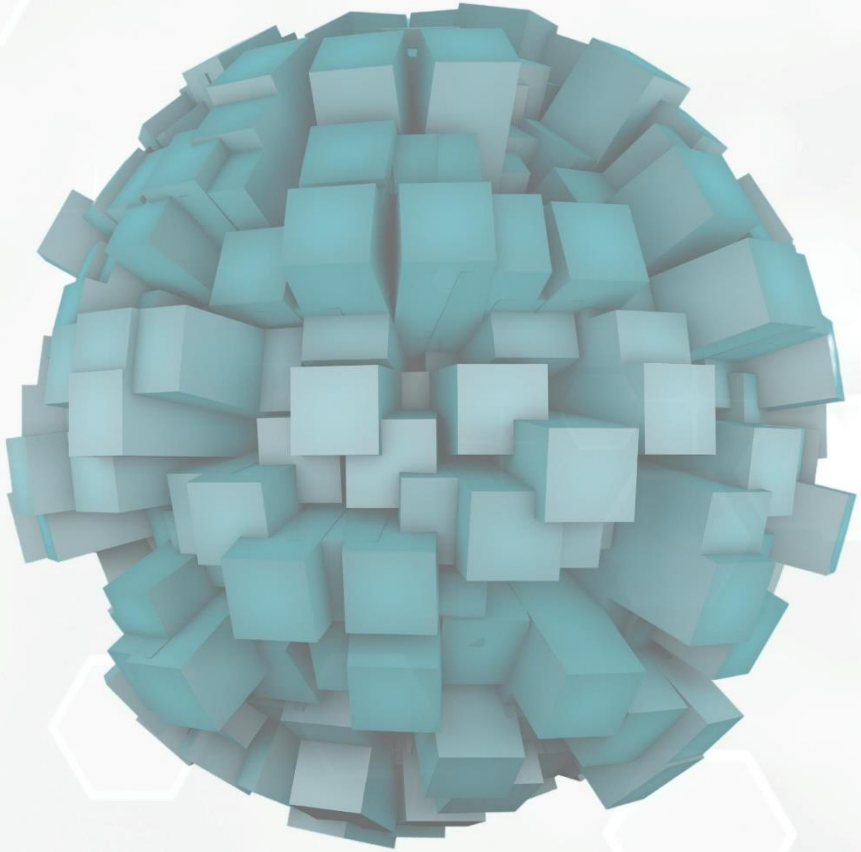
NSE Academy

Institute of Management Technology Hyderabad
Harnessing Knowledge for Businesses

Blockchain and Multi-Asset Approach to Tokenization

NFTs, Securities and Real-World Assets



Mr. Sharat Chandra
Blockchain &Emerging Tech Evangelist

Agenda

- About NSE Academy
- About IMT Hyderabad
- Blockchain & Multi Asset Approach to Tokenization
- PG Certificate Program in Financial Technologies - an Introduction
- About the Program
- Curriculum
- Pedagogy
- Case Studies
- Faculty
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- Q & A

National Stock Exchange of India Ltd. (NSE)

National Stock Exchange of India Ltd. (NSE) is the **leading stock exchange in India** and **largest Derivatives Exchange in the World** by volume of trade, according to World Federation of Exchanges (WFE) report.

Are driven by this ambition that makes India charge ahead and take a more prominent place on the global stage.

Powered by millions of dreams, hopes and aspirations, India today is brimming with potential.

Aim to catalyze India's growth story by creating investment opportunities, enabling access and empowering our stakeholders

We work harder, smarter and faster to deliver impact across the investment ecosystem.
In a world that changes shape by the second, we constantly reinvent ourselves to redefine the future.

About NSE Academy Ltd. (NAL)

NSE Academy is a wholly owned subsidiary of National Stock Exchange of India, India's premier and leading BFSI/Capital markets certification entity. NAL work with schools, universities, working professionals and organizations in developing financial skills through our programs in various aspects of banking, financial services, financial markets and financial literacy.

7 Million Certifications

3.2 Million Students Certified

3500 school, colleges & Higher Education Partnerships

Six State Boards Tamil Nadu, Goa, Himachal, Nagaland, Gujarat and Punjab

350+ test centers across India

NSE Knowledge Hub AI enabled Learning Experience Platform (LXP)

NSE SMART Trading Simulation Lab at campus

BFSI Functional & Domain, Behavioral, Leadership and Deep Tech Learning Offerings

About IMT Hyderabad

IMT has over 40 years of excellence in management education. IMT is an AICTE approved institution with campuses at Hyderabad, Ghaziabad, Nagpur and Dubai. It is only the second B School from Telangana and Andhra Pradesh to feature in the top 63 B-School NIRF Rankings released by MoE, GoI. It is driven by the vision of nurturing socially responsible business leaders through L.E.A.P.

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Hyper-fixation on Hyper-tokenization

By 2026, non-fungible token gamification will propel an enterprise into the top 10 highest valued companies.

Companies are quickly recognizing the potential of NFTs to grow business models and drive new revenue streams. Public blockchains are exponentially growing the ability to digitally connect value represented by tokens, bringing yet another wave of seemingly limitless opportunities in the digital world. Fungible and non-fungible tokens are driving a segment of this new phenomenon — called “hyper-tokenization.”

4,2 k

For 4'200 ETH or about USD 7.57 Mio, the most expensive CryptoPunk #7804 was bought on 11 March 2021.

Source: larvalabs.com/cryptopunks; Retrieved on June 22, 2021

16 Mio

Reportedly the largest NFT marketplace, *OpenSea* offers over 16 Mio items, from art to virtual reality to sports and trading cards.

Source: opensea.io/assets Retrieved on June 22, 2021

338 Mio

The market capitalization of NFTs is estimated at USD 338 Mio by 2020, with a CAGR of over 187% in 2018-2020.

Source: tradingplatforms.com Retrieved on June 22, 2021

The technical backstage – How does an NFT work?

The technology behind the artwork and hype: The technical composition of NFTs builds on the buzzword technologies DLT, Blockchain and smart contracts

DLT/Blockchain

The creation of NFT requires an underlying distributed ledger for records, together with exchangeable transactions for peer-to-peer network trading. While most NFTs to date have been built on Ethereum today some newer NFTs also use other blockchains such as Flow, Hyperledger or Fast Box for specialized application support. The popular blockchain systems employ hex values according to which the raw NFT data must be encoded.

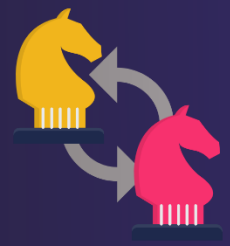
Smart Contracts

NFT solutions generally are leveraging smart contracts for order-sensitive executions. For the transfer of NFTs, the owner has to sign the transaction, including the hash of NFT data, and then sends the transaction to a smart contract. Upon the receipt of the transaction by the smart contract with the NFT data, the minting and trading process will be initiated. When the transaction is confirmed, NFTs will be premanently linked to a unique blockchain address.

Token Standards

The most commonly used token standards for generating NFTs are at present the Ethereum ERC-721 and ERC-1155 token standards, which allow lines of code to be developed to create unique tokens representing underlying assets.

Storing of NFTs: An NFT owner stores the raw data in an external database outside the blockchain. However, the owner may also store the raw data inside a blockchain.



Can you copy NFTs? With the caveat of existing IP rights, anyone can theoretically copy a digital file as many times as they want, including the art contained in an NF. However, NFTs are designed to offer something that is protected from replication: ownership of the work. Essentially, the owner of an NFT owns the original piece of hex values signed by the creator. While other individuals may freely copy the raw data, but they cannot claim ownership.

More than just art – The palette of NFT use cases

The playground of NFT applications extends over many more possible fields of application. Providing the uniqueness of the underlying asset, almost anything can be represented by an NFT – real art works, real property titles, houses, cars, bottles of wine, as well as digital assets such as images, documents, videos and tweets.

1

Real Estate

NFTs of real estate can accelerate the transfer of ownership, recorded and easily verifiable on the Blockchain, by using smart contracts. NFTs can also enable fractional ownership of real estate, allowing owners to unlock the value of previously illiquid assets and raise funds.

2

Music and Film

Smart contract technology allows musicians and filmmakers to transfer the copyrights of their works to NFTs so that they automatically receive royalties when their work is (dis)played. Artists can accordingly receive their fair share of profits for their work.

3

Consumer Goods

Tokenizing physical consumer goods such as grocery, jewelry, or medicines that are a part of the standardized supply chain from the manufacturer or producer to the consumer enables real-time tracking of products and empowers the manufacturer to identify fraudulent use.

4

Licenses & Certifications

NFT use cases can also be of great use in verifying licenses and certifications for course completions. e.g. for and on behalf of universities and employers. Furthermore, admins can save a lot of time by accessing such licenses with the functionalities of NFTs.

5

Gaming

In gaming ecosystems, players may be encouraged to unlock special accessories for their characters or other in-game items. The NFT qualities of rarity and immutability make it possible for players to verify the history, authenticity and origin of their in-game items.

6

Finance Industry

Finally, NFT solutions are also conceivable in regulatory compliance in the context of customer due diligence and know-your-customer verification. Accordingly, NFTs may be a method for the financial industry to store information in a secure and tamper-proof way.

Potential Evolution of the Digital Assets Economy

Whiile many Blockchain applications are still digitally naive, there are increasing opportunities for more comprehensive usage across the digital assets economy

Long-term

Digital Assets	**Digital Assets** Bitcoin, Ether, BAT	**Stablecoins** Dai, Private (USDC, Novi), Central Bank Digital Currencies	**NFTs** Digital Collectibles, Arts, Avatars, Royalty Stream	**Securities (Tokenization)** Equity, Debt, Real Estate, Derivatives, Funds and Hybrid
Smart Contracts	**Primitive Services** Lending, Borrowing, Insurance, Trading, Derivatives, Synthetic Assets		**Embedded Features** Loyalty Dividends, Tenure-based Voting	
Distribution (Blockchain)	**Public Blockchains** Bitcoin, Ethereum	**Enterprise Blockchains** Private Networks	**Blockchain Interoperability** Combination of public and private chains	
Settlement and Custody	**Global Payment Settlement Network without Intermediaries**	**Delivery Vs Delivery** Improvement of collateral mobility	**Settlement of Securities**	

What is Tokenization?

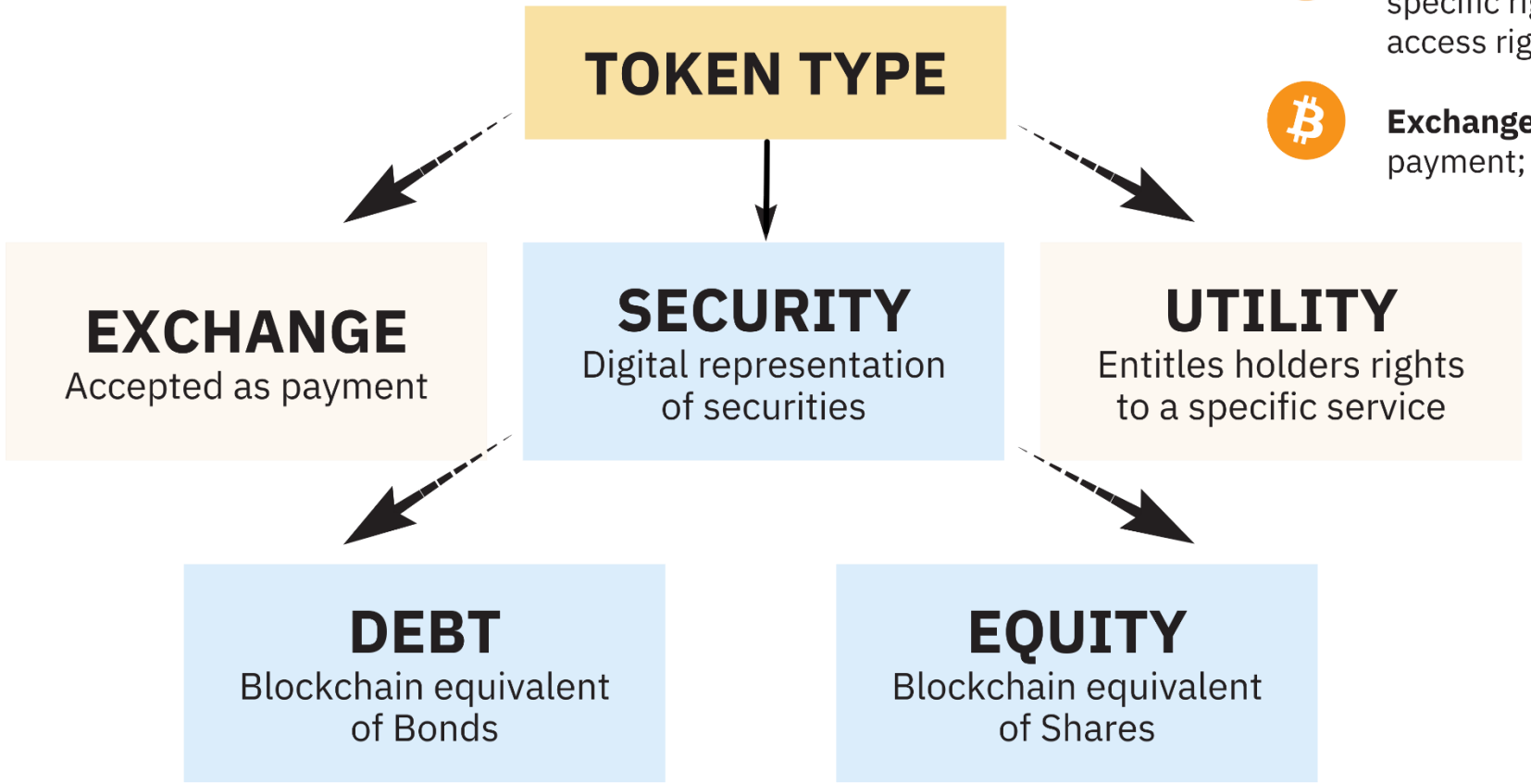
Tokenization can be defined as the process of creating a digital representation of a non-digital asset; the digitization of an asset.

The underlying asset could be anything from financial products like shares and bonds, or real tangible assets such as real estate, art, collectibles or sports teams.

Tokenization enables the digital transfer and management of these real ‘of chain’ assets in the digital world.

Source – Tokenization of Alternative Investments Liquefy CAIA Association BNP Paribas Asset Management

- **Security Tokens** which represent ownership of interests associated with the underlying asset (e.g. ownership, right to dividends)
- **Utility Tokens** which give holders access to specific rights and privileges such as use or access rights to a building or service
- **Exchange Tokens** which are used as a form of payment; one example is Bitcoin

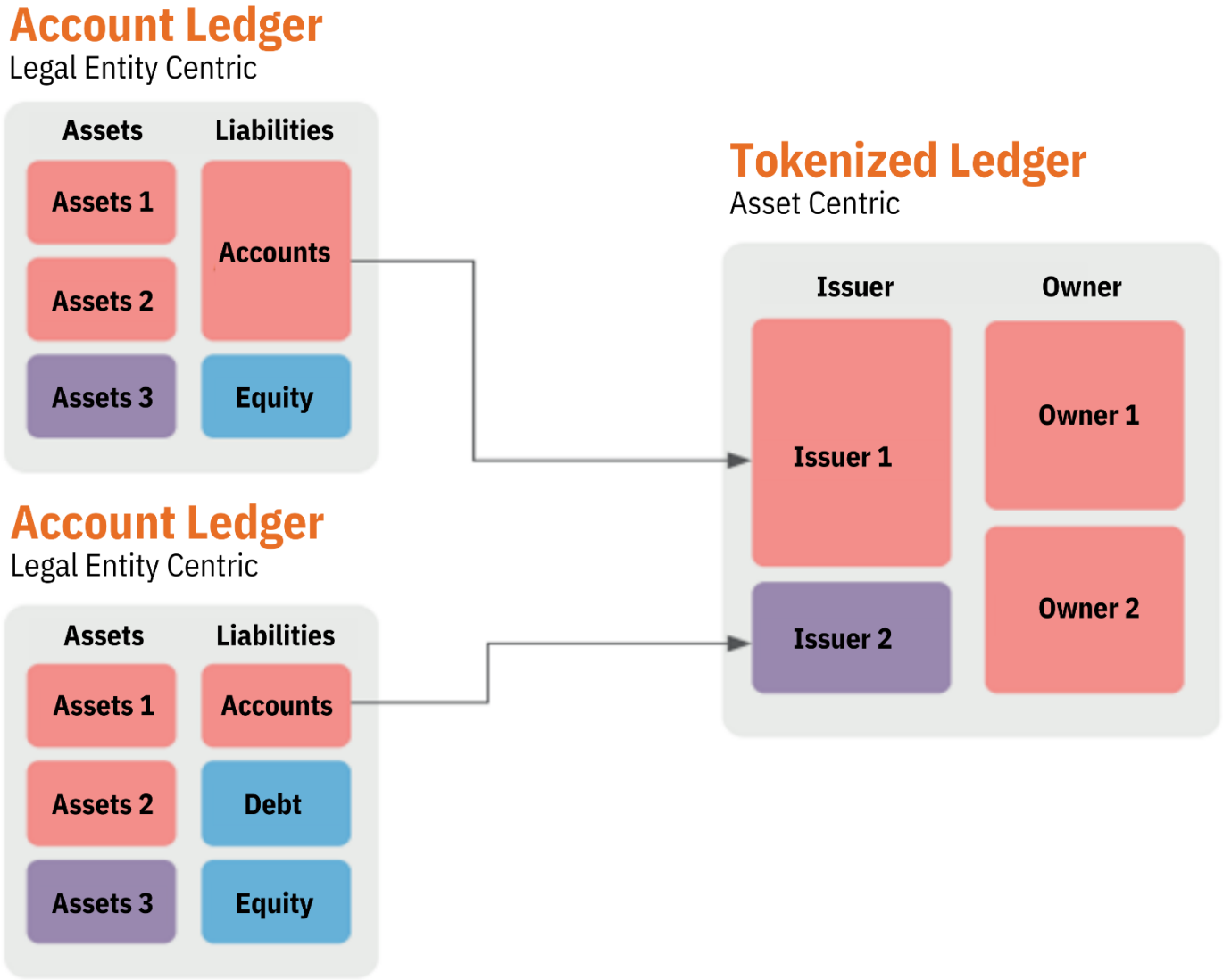


Source - Tokenization of Alternative Investments Liquefy CAIA Association BNP Paribas Asset Management

Account Vs Tokenized Ledgers

Account Ledger

Account Ledgers are legal entity centric. They chart all the assets and liabilities of a single legal entity.



Tokenized Ledger

Tokenized Ledgers are assets centric. They maintain, for one or more assets, which legal entities are 'issuers' and who are 'owners'.

Single Location for Asset

Users know there is a location where their assets is recorded.

Direct Interaction

Users can interact directly with a token ledger.

Instant Settlement

A single message results in instant settlement.

Benefits of Tokenization

Fractionalization

The asset can be split into far greater amounts than using traditional methods. This lowers the entry barriers to investments that have high minimum investments and lower ticket numbers.

Data Transparency

Data can be stored and accessed securely on the blockchain due to the immutable and distributed nature of blockchain technology

Shorter Settlement Time

Data can be stored and accessed securely on the blockchain due to the immutable and distributed nature of blockchain technology

Operational Efficiency

Processes such as compliance, white-listing, escrow account management, dividend distribution, corporate action management, and drag-along actions can be automated with smart contracts.

Flexibility

Tokens can be customized with unlimited share classes and flexible fee structure at low operational cost. Funds can be fractionalized, enabling greater flexibility in portfolio construction and exposure diversification.

Liquidity

Tokens can easily and securely be exchanged on a secondary OTC market securely using blockchain. The valuation of the core underlying asset may increase due to the possibility of secondary market trading and greater liquidity, thereby reducing the 'liquidity premium' of an asset.

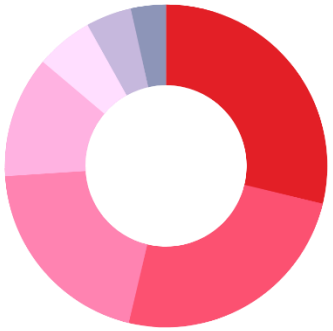
Source - Tokenization of Alternative Investments Liquefy CAIA Association BNP Paribas Asset Management

Tokenization of Alternative Instruments

Alternative Assets becoming Mainstream

Appetite for alternative investments has grown considerably in recent years, reaching worldwide assets under management (AUM) value of around USD 13.4 trillion. Traditional assets account for over USD 102 trillion. Between 2005 and 2011, the AUM of alternative assets grew by 14.2% compared to just 1.9% for traditional assets.

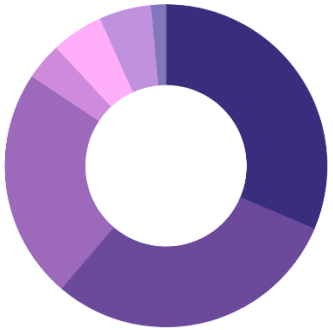
2018 Global Investible Market (in US$ Trillions): Alternative Assets increased to 12% of 2018 Global Investible Market from 6% in 2014



Traditional Assets

- $29.5T Non-Dollar Bonds
- $25.6T US Equities
- $20.8T Dollar Bonds
- $12.5T International Equities
- $5.9T Real Estate Debt
- $4.7T Emerging & Frontier Equities
- $3.6T Cash

Total: $102.6 Trillion



Alternative Assets

- $4.2T Private Equity
- $4.0T Hedge Funds & Liquid Funds
- $3.1T Real Estate
- $0.5T Infrastructure
- $0.7T Natural Resources
- $0.7T Private Debt
- $0.2T Commodity Derivatives

Total: $13.4 Trillion

Source – Comparison of Traditional Assets Vs Alternative Assets from 'Next Decade of Alternative Investments 2020 Report' CAIA Association (2020)

How Tokenization addresses the Challenges

Greater Transparency

Token-holder's rights and legal responsibilities as well as record of ownership can be embedded into tokens.

More Inclusive Access

Increased access to more investors to the previously unaffordable or insufficiently divisible asset class.

Faster/Cheaper Transactions

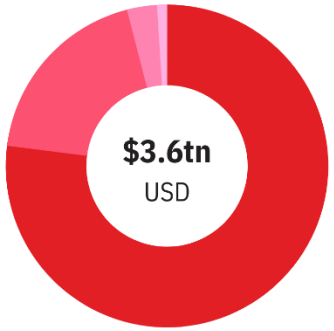
Reduced transaction and lifetime cost through lower complexity and better operational efficiency.

Better Liquidity

Tokens can be traded in secondary markets

Overview

Hedge Funds



Market Size

- 77%
- 19%
- 3%
- 1%

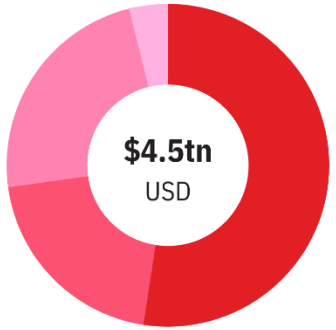
Challenges

- Lack of Transparency
- Limited Access
- Non-normal Returns
- Lock-up Period

Risks/Constraints

- Requires a sizeable universe of hedge funds to construct a portfolio
- Liquidity hinges on functioning secondary market

Private Equity



Market Size

- 54%
- 21%
- 24%
- 4%

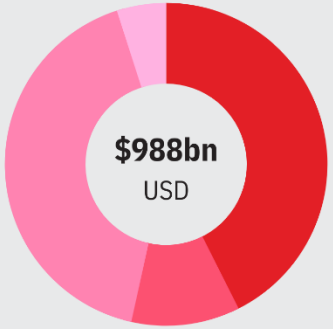
Challenges

- Lack of Access
- Need for Diversification
- Illiquidity
  (5 to 7 years lock-up)

Risks/Constraints

- Requires a sizeable universe of private equity funds to construct a portfolio
- Private equity requires more complex due diligence
- Liquidity hinges on functioning secondary market

Venture Capital



Market Size

- 43%
- 11%
- 42%
- 5%

Challenges

- Illiquidity
  (5 to 7 years lock-up)

Risks/Constraints

- Venture Capital requires more complex due diligence
- Liquidity hinges on functioning secondary market

Source: Compiled by CAIA Association, Data from Preqin

Asia Europe North America Rest of the World

Metaverse : One Trillion Dollar Annual Revenue Opportunity

Revenue from virtual gaming worlds could grow
from $180 billion in 2020,
To $400 billion in 2025.

- Grayscale Investments

What is Metaverse?

Metaverse - a virtual ecosystem where users can interact, experience, transact, and generate value together

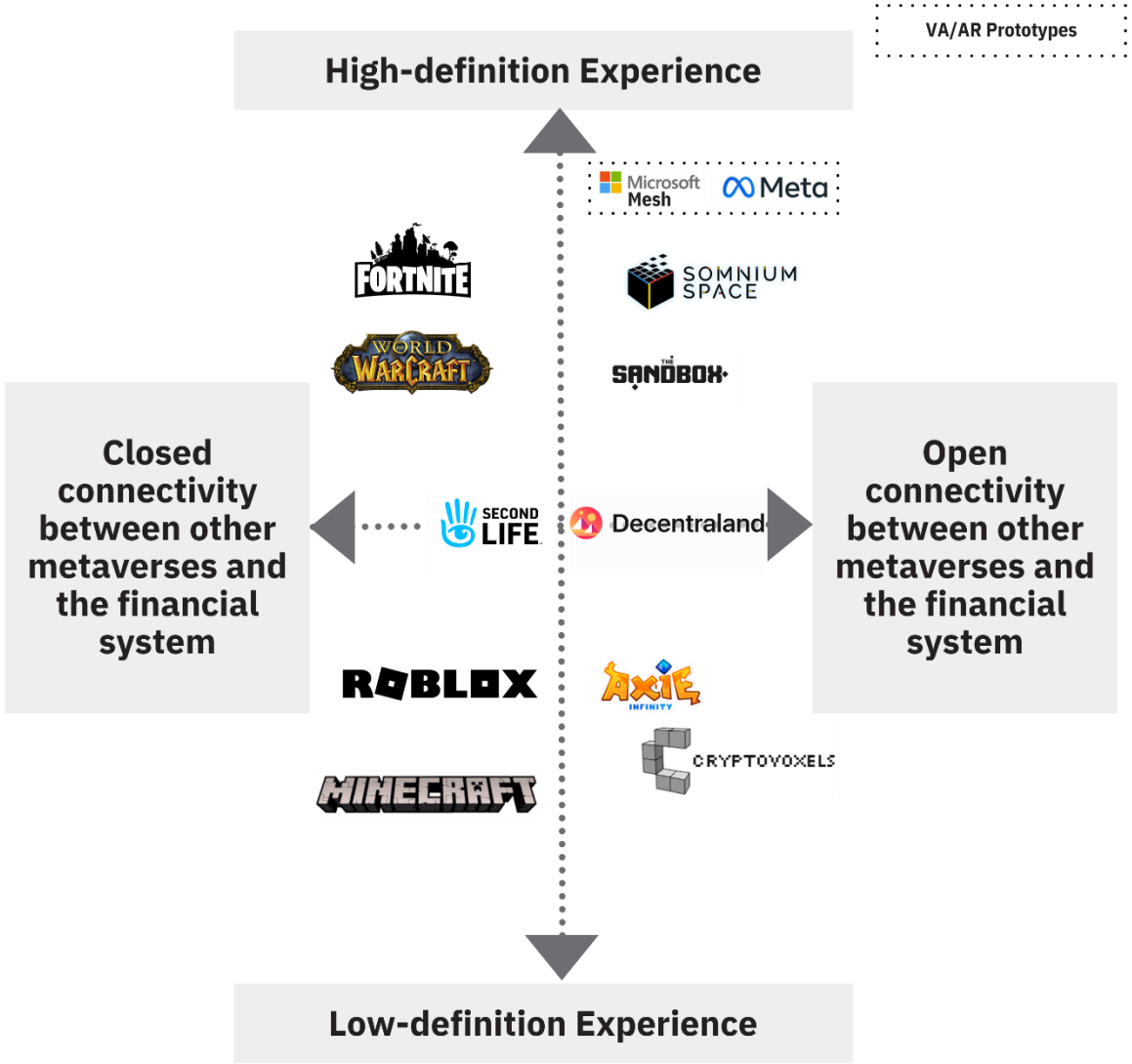
M The concept of metaverse is not new. In fact, early open world games such as World of Warcraft are already closed metaverses where users can interact with each other.

E A metaverse ecosystem is not only applicable to games - further human-based ecosystems can be built within them, where people can work and societies can create their own rules and financial systems.

T The metaverse is currently propelled by two technological developments:
- Performance / Experience: 5G and AR/VR developments help increase the quality of experience within metaverses.
- Blockchain: increasing financial connectivity allows tokens/currencies used within a metaverse to transfer value across ecosystems, and from the virtual to the physical world.

A Further unlocking the metaverse is a huge milestone as the gradual reduction of differences between the virtual and physical worlds ramps up.

The Current Metaverse Landscape



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PG Certificate Program in
Financial Technologies

PG Certificate Program in FinTech: Introduction

- First-of-its-kind **100% online program** that provides in-depth exposure to core Fintech domain
- The Program equips professionals with both the academic and industry insights coupled with practical knowledge
- Participants learn extensively through case studies and interactions with industry leaders and entrepreneurs from the FinTech space

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PG Certificate Program in FinTech: About

- **360 DEGREE LEARNING:**
  - **Industry Learning**: An industry-oriented practical curriculum that aligns with globally-recognized standards and features the very latest global trends and best practices.
  - The program will be delivered online through experiential learning elements such as case studies, group projects.
- **COMPREHENSIVE COVERAGE:**
  - The Program covers an overview of all important aspects of Fintech, including Blockchain and AI etc. The Program also covers how emerging technologies are continuously disrupting traditional financial services.
- **INDUSTRY CONNECT:**
  - The Program will be delivered live by IMT Hyderabad Faculty and Industry Practitioners representing various facets of the Fintech industry.

PG Certificate Program in FinTech: Curriculum

The curriculum has been designed after taking inputs from Industry Experts and has been divided into seven parts:

- Overview of Financial Technology
- IOT and APIs
- Blockchain
- Cryptocurrencies
- Avenues of FinTech
- AI/ML Strategies for FinTech
- FinTech Regulations

PG Certificate Program in FinTech: Pedagogy

The Program comprises of a series of lectures, discussions, assignments, projects, and online assessments. The teaching and learning model encompasses the following:

- Blended technology-enabled education
- Resourceful faculty
- Application-based pedagogy
- Collaborative learning approach
- Lectures and guest sessions by industry experts
- Experiential learning through practical & hands-on training

PG Certificate Program in FinTech: Case Studies

- PayTM - Navigating the transition from e-Wallet to Payments Bank
- Funding Societies - Leveraging FinTech to support small businesses
- Citi Bank - Innovating the customer's journey with FinTech
- Street Shares, Inc. - Fintech platform lending business
- Cutting through the Fog - Finding a future with Fintech
- National Payments Corporation of India - Cutting-edge FinTech ecosystem innovation in India
- Building India's 2.0 - PayNearby
- How Does Digital Transformation Happen? The Mastercard Case

PG Certificate Program in FinTech: Faculty Profile

Prof. A. Sarath Babu

Program Director | Associate Professor - Finance & Accounting, IMT Hyderabad

Prof. Sarath Babu has over 18 years of teaching and industry experience. He teaches contemporary and advanced courses in the area of Finance and Accounting. He has done a course on Statistical Methods in Risk Management at the London School of Economics and Political Science, and hold a Ph.D in finance from the University of Madras. He has published research papers in national and international journals. He has been conducting MDPs in finance and fintech for various corporates. Prior to joining IMT, Hyderabad, he has worked with WIPRO and Steria.

Prof. (Dr.) Mahesh Ramalingam

Assistant Professor & Area Chair - IT & Analytics, IMT Hyderabad

Dr. Mahesh holds a Ph.D. in Management from the University of Hyderabad. He teaches Machine Learning Algorithm, Big Data Analytics, Business Intelligence using SAS, Visual Analytics, Blockchain for Managers, Programming for Data Science, Data Analysis for Decision Making, and Business Research Methods. His primary areas of interest are service quality and consumer behavior and other works include the development of metrics to evaluate marketing decisions. He has conducted workshops and FDPs related to scale development process, multivariate data analysis, covariance-based SEM, PLS-SEM, FIMIX, mediation analysis, moderation analysis and conditional process modeling, Visual Analytics, etc.

PG Certificate Program in FinTech: Faculty Profile

Prof. (Dr.) Surajit Ghosh Dastidar

Associate Professor - IT & Analytics & Chairperson - Centre for Digital Transformation
IMT Hyderabad

Dr. Dastidar has around 20 years of experience in academics and research. He teaches courses on AI/Machine Learning, Predictive Modelling, Decision Analytics, Business Modeling and Business Statistics. He was a Visiting Research Scholar at the University of Toledo, USA. He has also participated in the Summer School at London School of Economics & Political Science - in Data Science and Big Data Analytics. In 2019, he has been recognized as SAS Faculty Scholar by SAS Institute. He has also won numerous awards such as AIMS Best Case Award, ISB Case-Chase Award, Sitaram Rao Livelihood Case Award, R. K. Srivastava Case Award, Outstanding Management Teacher Award, Young Management Researcher Award. He has published in journals like Journal of Statistical Software, International Journal of Business Analytics and Intelligence, Journal of Advances in Management Research among others. He has done Masters in Business Management from Department of Business Management, University of Calcutta with a specialization in Operations Research and Systems Analysis and a Ph.D from ICFAI University.

PG Certificate Program in FinTech: Industry Practitioners

CA Sundeep Mittal

Chief Executive Officer - Decifer FinTech

Mr. Mittal is a qualified Chartered Accountant with rich consulting experience with national and multinational corporations in a variety of areas including financial management, accounting, and process improvement. Sundeep Mittal is also a Co-founder of FinAdvantage Consulting, headquartered in Bengaluru. He has previously worked in senior leadership roles as CFO, Associate Director, and Manager with UCI Logistics, KPMG India, and other organizations, for over a decade. He has been a pioneer in spearheading the accounting advisory services. At KPMG, he and his team was instrumental in assisting DuPont on a USD 10 billion carve-out project. Financial Technology is his forte.

Mr. Sharat Chandra

Blockchain & Emerging Tech Evangelist

Mr. Sharat Chandra is a keynote speaker, Blockchain & Emerging Tech Evangelist and ecosystem builder. He advises across sectors, with a focus on blockchain and fintech. He drives engagements with Governments, Policy Makers, & Industry Associations. He is recognized as HederaMVP and has mentored multiple start-ups in blockchain and FinTech space. He leads IET India's Blockchain Working Group and has contributed to the formulation of Tamil Nadu Government's Blockchain Policy. He si also associated with BarclayRise - Barclay's flagship FinTech mentorship program and conducts knowledge-sharing sessions with start-ups. He writes thought leadership articles on technology in ET Markets, Express Computer, Nasscom Community, Entrepreneur India, and ET Insights. He is featured regularly in leading publications such as Financial Express, TechCircle, The Quint, LiveMint, and Inc42.

PG Certificate Program in FinTech: FinTech Leader

Mr. Kishore Konakanchi

Head of Product - Checkout & Billing at PayPal
Saratoga, California, United States

Mr. Kishore is a seasoned product leader who loves to design & build products that delight consumers. He enjoys building customer delightful products at scale. With background in technology, Mr. Kishore has as much fun creating teams aligned around a vision and energize them to execute. Customer facing products are adrenaline to him. He is a FinTech expert in charge of implementing related projects in his current organisation.

Program Details

- **Duration & Schedule**
  - Six months | Online | Weekends
  - Program commences in December 2021

- **Eligibility**
  - Early Career Professionals.
  - Aspiring FinTech Professionals engaged in middle or senior level in Banking, Financial Services, Management & Technology.
  - Entrepreneurs and Business Owners.

- **Fees Structure**

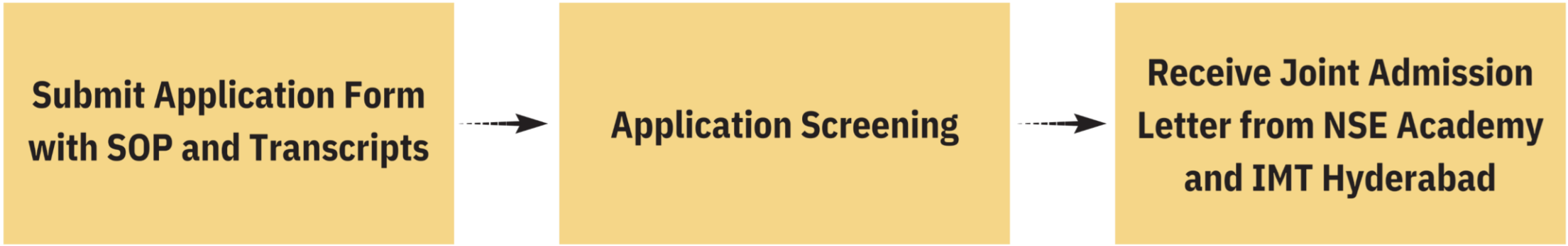
  Total investment for the program will be **INR 90,000 + GST** (**Flexible Payment Options available**)

  Application Fee : INR 10,000 + GST

  Programme Fee : INR 80,000 + GST

Program Details

Application Process



Concession Criteria

Early applications concession available
Corporate enrolment concession available

Thank You!

For further information, contact:

Mr. Seshagiri: 9307250745
Ms. Sukanya Kanade: 8591297096