



**YOJANA**

**OJAANK IAS  
ACADEMY**

**JUNE, 2022**

**WWW.OJAANKEU.COM**

**8750711100/44**

# OJAANK IAS ACADEMY

## Our Selected Students in IAS 2020

Congratulations to Our Toppers

**01** Ranks in Top 10 | **10** Ranks in Top 50 | **26** Ranks in Top 100



**RANK 01**  
**SHRUTI SHARMA**



**RANK 58**  
**FAIZAN AHMED**



**RANK 96**  
**MINI SHUKLA**



**RANK 125**  
**MD. MANZAR HUSSAN ANJUM**



**RANK 133**  
**KISHLAY KUSHWAHA**



**RANK 176**  
**SHREYA SINGHAL**



**RANK 203**  
**MOHAMMAD AAQUIB**



**RANK 270**  
**HARIS SUMAIR**



**RANK 283**  
**AHMED HASANUZZAMAN CHAUDARY**



**RANK 389**  
**MOHIBULLAH ANSARI**



**RANK 447**  
**FAISAL RAZA**

**OJAANK IAS ACADEMY** **CREATED HISTORY**

**SHRUTI SHARMA**  
**AIR - 1**  
**UPSC 2021-2022**

**Pioneer Of Online Classes**

+91 - 8750711100/44  
[www.ojaankedu.com](http://www.ojaankedu.com)



SHRUTI SHARMA (IAS TOPPER) WITH OJAANK SIR

**Now In Karol Bagh-** 18/4, 3<sup>rd</sup> Floor Opposite Aggarwal Sweet  
Near Gol Chakkar Old Rajinder Nagar Karol Bagh, New Delhi-110060

ANDROID APP ON  
**Google play**

Download App  
**OjaankEDU**



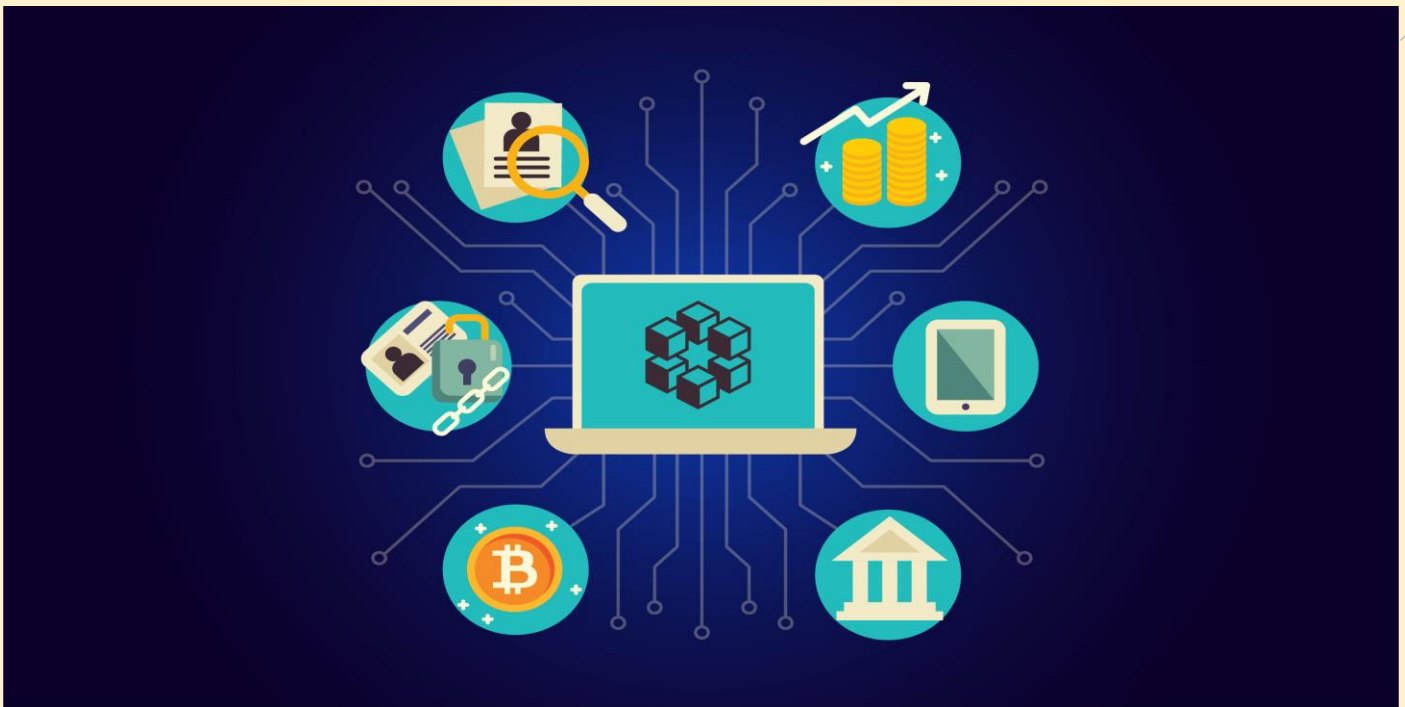
# Decoding Modern Tech Terms

## Why You Should Know?

- With the new-age technology, we are in a world of infinite possibilities. A metaverse of myriad avenues is waiting to be explored to its full potential.
- Let us understand the scope and opportunities of some of these interesting technologies and disruptors.

## Blockchain

- **Blockchain** refers to a system whereby information about transactions is stored on countless computers spread across the globe. It is considered as an alternative to the conventional banking system.
- Notice what happens when you transfer money to someone through your bank account or apps like Paytm.
- That money is deducted from the amount kept in your account in that bank, and the same money is added to the account of the other person in another bank. Both the banks use a ledger that keeps the details of the money transactions between you two.
- Along with banks, this also applies to mobile payment systems. The role of the bank in this process is to save money and keep details of the transactions.
- The bank certifies how much money is in your account and to whom you have given or taken the money from. What if the same thing is done without the bank? This is the vision behind Blockchain. Under this, transactions of a similar kind are recorded on computers worldwide, and this system has nothing to do with the banks.
- The information stored under the Blockchain is even more secure than our banking system because countless copies of that information are kept on computers around the world. No one can hack so many computers. The cryptocurrency, which is much talked about nowadays, has its transactions done through this blockchain system.



## NFTs

- The success of blockchain as an independent means of storing and authenticating information has created many more innovations. One of these is the NonFungible Token, or NFT.
- Here, the information is stored in the blockchain system itself, especially in a system called ethereum. We know about cryptocurrencies and know that if we have purchased cryptocurrencies, its account will be kept in the blockchain. But let's say you have not bought cryptocurrency, but an expensive original painting, something of historical importance, or memorabilia (such as a special attire worn by a celebrity).
- It is something which is unique in the entire world. How can you prove you are the owner of that item and it is the real thing and not a fake copy of it? Presently, there is no provision for this except that the organisation from where you have bought it can give you a certificate of ownership or get it stamped as an original by giving an affidavit in court. Imagine what it would be like if a technology platform could store and authenticate information about such unique things. This platform is NFT.
- Under a Non-Fungible Token system, a kind of digital certificate is issued that such an original thing, unique in the world, is owned by you. This digital certificate cannot be tampered with.



- NFTs can be associated with physical assets and virtual or digital assets. Some time ago, you may have read the news that Jack Dorsey, Founder of Twitter, sold the first tweet he ever posted through NFT for USD 2.9 million. You may ask– how can one sell a post made on a digital platform?
- Anyone can copy it, take its screenshot or create a similar post. And how to prove that it is the same original note as it has not been kept as a printout? So the NFT proves that Jack Dorsey has sold this comment and is now owned by the CEO of a Malaysian cryptocurrency company.
- The price is for the information and certificate only. Now, no one else can sell it except its new owner. Even though millions of people retweeted the original tweet, anyone can copy it, but the post owned by that person will be considered original. The rest of the millions of tweets around the world will be considered copies.
- This digital certificate is not in the form of writing but in the form of a digital image, video, etc. The same is called Non-Fungible Token (NFT). Non fungible means that it is the only one in the world, i.e., unique.
- This digital asset has been created so that it cannot be copied, and therefore it is safe. There is an immense need for such NFTs (images, videos, animations, illustrations, etc.) in the form of certifications associated with such digital assets. Hence, technically proficient people are engaged in the manufacturing and trading of NFTs.

## Metaverse

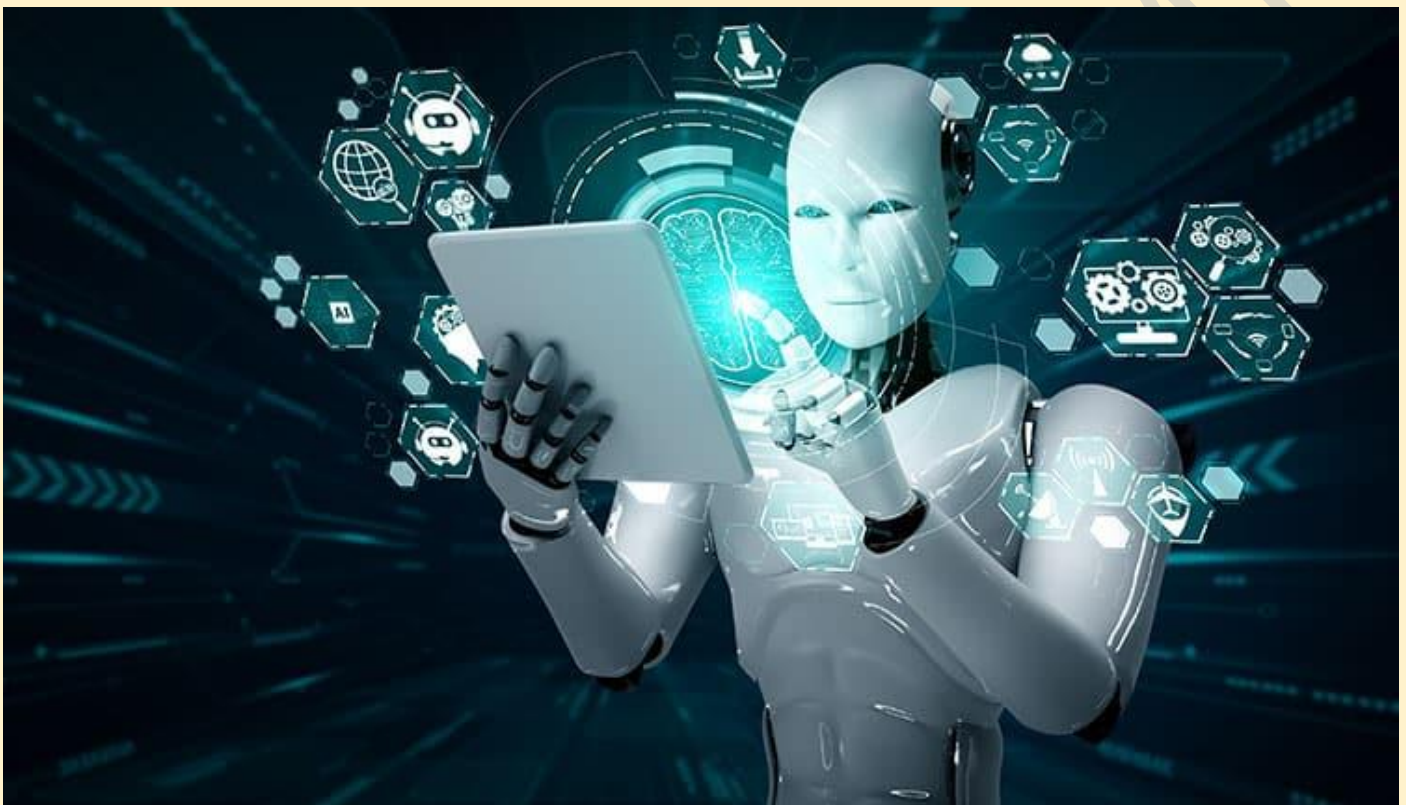
- Metaverse means a parallel universe present in the digital world that contains most of the things that exist in our physical world. Accessing this virtual world requires the Internet and digital devices, just like you would access a video game.
- You present yourself as a digital person in the game, competing with other players, making friends, and engaging in other activities. You participate in the game from your laptop while others take part through gaming devices or mobile phones.
- If the same video game is expanded widely and countless people could access it digitally, it would be the metaverse. However, it will not merely be a gaming activity.

- There will be much more, such as various events, business, entertainment, meetings, etc. People like us will be there but in their virtual, digital avatars.
- Companies like Microsoft, Meta (Facebook), Decentraland, Nvidia, and Unity are engaged in making it a reality. Within the next five to ten years, such possibilities can open for all of us in the digital world that we can only imagine at the moment.

### Quantum Computing

- The Quantum computer is much talked about because of its infinite power. A quantum computer can perform calculations millions of times faster than a normal computer, and that is why it can prove to be a boon for humanity, but it can also give rise to new challenges.
- Traditional computers work based on a fundamental unit of binary digits (0 and 1) called 'bit'. On the other hand, the Quantum computer adopts Qubit (Quantum Bit). While the bit value can be 0 or 1 only, the qubit value can be 0, 1, or both. Unlike traditional computers, quantum computers are not limited to just two states. Where transistors are used in normal computers— atoms, electrons, ions, photons, etc., are used in quantum computers which can be superimposed on each other.
- The working system of a quantum computer differs completely from the traditional computer, and its capacity is tens of millions of times more.
- Let us understand it with an example. The information encrypted through an encryption system called RSA is so difficult to decode that if an attempt is made to crack this encryption with the help of ordinary computers, a very powerful computer capable of performing ten trillion calculations in a second, it will take three thousand trillion years. On the other hand, a quantum computer of ordinary capacity, capable of performing a million calculations per second, can do the same thing in just 10 seconds.
- Presently, only a few quantum computers have been developed in the world. The world's first, very small quantum computer was built in 1997. In 2007, a company called D-Wave Systems of Canada introduced a powerful 28-qubit quantum computer.

- Today, Rigetti's quantum computer is considered the most powerful, with a capacity of 128 qubits. Except for small systems, even today, the number of quantum computers with good capacity will be less than two dozen in the world.
- They are being used at institutions like IBM, Intel, Google, Rigetti, Microsoft, NASA, D-Wave, Alibaba, IONQ, Oxford, Berkeley, Stanford universities, and the Massachusetts Institute of Technology (MIT). Here, Microsoft and IBM have given the facility to use quantum computers through the cloud.



### Artificial Intelligence (AI)

- Artificial intelligence (AI) is one of the most talked about topic all over the world. In the future, it will become an important part of our lives and emerge as a huge technological force.
- It can bring about unprecedented changes in the world and has the potential to change the way we live, work, read and write, travel, do business, run industry, and get medical treatment.
- It is believed that AI will transform the world in a big way, similar to what electricity has done. How can one think of a working day in which electricity does not play a role in some form or the other?

- Machines equipped with AI will become powerful and ‘intelligent’ and compete with human beings’ capabilities.
- AI refers to the ability of machines (or technology) to learn, analyse, think, understand, solve problems, make decisions, etc., similar to a human being. No other creature in the world has such abilities except human beings.
- Even if a creature possesses any of these abilities, it is at a minimal level. But now, technology has advanced so much that lifeless machines have similar capabilities. Now, machines have started doing many things that our senses do.
- They can see, hear, speak, move, and even feel touch. Apart from advanced research and development, many factors are creating this capability, such as the availability of large amounts of data, the ability to analyse it, the enormous increase in the capacity of computers, and the development of cloud computing, internet connectivity, etc.
- You must be using features like machine translation and voice-to-text conversion these days. All these have reached to you because of AI. But this is just the beginning.

### Cloud Computing

- Whatever enormous work has been accomplished through AI today, it would not have been possible without the help of cloud computing. Cloud computing has made vast computational power and storage space available to us, and technology like AI requires it for calculations.
- Cloud computing implies using the resources available on the internet on your computers or devices. These resources are broadly of three types— the complete infrastructure of IT, i.e., hardware, software, etc. Suppose you need to work on a Mac computer for a few months. The cloud has a complete set of Mac computers.
- Why don’t you use it virtually? For example, you are using many services on the Internet (such as email) when the software required for them is not present on the computer. If you want to use a Mac through the cloud, it is also possible in the same way that you would use Gmail or Dropbox through your browser.



- You will be connected to the internet from within your Windows computer, and from there, you will be able to access the Mac hardware and software. These are also called virtual machines, which you have in virtual form, but not in physical form.
- Interestingly, you have neither bought the Mac nor have it with you. Through virtualisation technology or any internet browser (Edge, Chrome, Safari, etc.), one can use it.
- When you use any such infrastructure or infrastructural facilities remotely through the internet, it is called Infrastructure as a Service (IaaS). It is one of the three major categories of cloud computing.
- The word ‘Cloud’ refers to the infrastructure on the internet where various types of technical resources are present, such as hardware, software, and services. There are two more types of cloud– Software as a Service (SaaS) and Platform as a Service (PaaS).
- As the name suggests, SaaS is the service you can use through the cloud for some time without buying softwares like Photoshop, Microsoft Word, or AutoCAD.
- PaaS means technology platforms using which you can develop softwares and manage them, providing them to others for use. Everything is done remotely through the internet, without having to buy anything.

### About Internet of Things

- The Internet of Things or Iot simply means connecting various things of the world to the internet. Iot forms the network of physical objects i.e. things, enclosed with sensors, software, and other technologies for the purpose of connecting and exchanging data over the internet.
- These devices range from day-to-day objects to complex industrial tools. Everyday objects— household appliances, cars, etc., connected to the internet via embedded devices and seamless communication.
- Minimal human intervention allows data to be shared and collected by means of low-cost computing, the cloud, big data, analytics, and mobile technologies.
- Digital systems can record, monitor, and adjust every interaction between connected

things. Iot can be put into three categories where—

- 1) information is collected and sent. For example, sensors allow us to automatically collect information from the environment which, in turn, allows us to make more intelligent decisions;
  - 2) information is received and acted upon, like printers, and
  - 3) doing both simultaneously.
- For example, sensors can collect information about the soil moisture to tell the farmer and the irrigation system can automatically turn on as needed, based on how much moisture is in the soil.



# Digital Disruptor

## Why You Should Know?

- Regardless of the sector or vertical, new-age technologies are gradually ushering in the transformation of organisations and economies.
- The economic and financial landscapes are being revolutionised by rapid breakthroughs in technology, which more often than not, are disruptive with immense long-term potential to benefit society at large.
- Some of the broad domain areas which are witnessing a lot of churning with respect to the introduction of technologies that have potentially far-reaching positive impact, especially on developing countries like ours, are as follows:

### Artificial Intelligence (AI) and Machine Learning (ML):

- **AI technologies provide a plethora of opportunities to complement human intelligence and combat socio-economic issues.**

### Quantum Computing:

- **Applications in secure communication, disaster management through better prediction, computing, simulation, chemistry, healthcare, cryptography, imaging, etc.**

### Semiconductor Technologies including Semiconductor Nanotechnology:

- **Aim to give a major push to the hardware industry by eliminating boundaries between the digital and physical worlds.**

### Smart Manufacturing:

- **Use of Internet of Things (IoT), Blockchain, Big data Analytics, AI and Robotics as a part of Industry 4.0, more commercial use of additive manufacturing (i.e. 3D printing).**

### Smart Mobility:

- Use of IoT and AI/ML in new-age transportation and logistics solutions, autonomous and remotely piloted vehicles, vehicles powered by renewable and clean fuels.

### Advanced Communication Technologies and its Security:

- Adoption of 5G, Cloud computing, penetration of broadband internet to remotest and least developed areas using satellite-based internet, optical fibre, etc., for use-cases such as Tele-health, remote learning and much more.
- Advancements in cyber security and the hardening of communication systems are also expected to stay apace with the communication and networked technologies.
- This includes building more secure cryptography solutions as well as the use of Homomorphic encryption technologies.

### Space Technologies:

- A plethora of futuristic technologies like Satellite Based Quantum Communication, Quantum Radar, Self-Eating Rocket, Self-Vanishing-Satellite, Self-Healing Materials, Humanoid Robotics, Space-Based-Solar Power, Intelligent Satellites and Space-vehicles, Make-in Space concept, AI-based space applications, etc.

### Blockchain-based technologies:

- Development of solutions in areas such as Decentralised Financing (DeFi), sovereign digital currencies, and the possible creation of sovereign identities.

### Biotechnology:

- This includes advancements in areas such as Synthetic DNA, Development of Vaccines, 4D printing and Tissue Engineering, Gene Editing, Gene Sequencing, Quantum Microscope, Biosensors, etc.



### Agri-food Technologies:

- **Sustainable and remunerative Agriculture (and its allied sectors) is the key to the food security of societies. Technologies related to climate-resilient farming, development of high-yielding seed varieties, resource-conscious and frugal irrigation, seeding, harvesting, and post-harvest technologies will define the future of agriculture, especially for developing countries that have large percentages of their population dependent on it.**

### Climate & Environmental Conservation:

- Focus on green and sustainable technologies, renewable energy such as solar, Green Hydrogen, etc.
- It is expected that a lot of these areas and technologies shall have synergy as well as interdependencies among them, so as to ensure a holistic technology framework. This shall possibly require close collaboration among sectors and industries and lead to an impact that is universally felt by all sections of society.
- In this context, it is also important to acknowledge the role and extent of the digital character of these technologies in their successful deployment and acceptance.
- Digitisation, in this age, has to be the common link in all the sectors of any successful economy as well as in all the aspects of a progressive society. The indispensability of going digital in any recent or future technological endeavour cannot be emphasised enough.
- In India, Aadhaar has played and continues to play an integral role in providing a unified national digital identity framework. Aadhaar has become one of the most important pieces of public digital infrastructure ever to be built in the country.
- The strength of this foundational infrastructure is now being increasingly felt in almost every sphere of life of residents of the country.
- Aadhaar is the world's largest Digital Identity Platform, which was planned and rolled out with a clear set of developmental objectives.

- The astounding success of Aadhaar and its Digital Identity Platform with billions of authentication transactions already being performed on it has proved its reliability, robustness, and security to the entire international community.
- It is the most trusted ID held by almost one-sixth of the population of the world residing in India and is the foundation of India's digital democracy. It has reached the saturation point covering a large number of the population.
- Around 99.9% of the adult population of India is already enrolled with it. Approximately 1.33 billion Aadhaar cards have been generated till date and over 600 million updates have been done by the residents. Over 70 billion Aadhaar authentications have been done till date.

Aadhaar was conceived as an online identity platform that used technology to deliver on its promises:

- ✓ Uniqueness— ensuring one person one ID
- ✓ Online verification and KYC to enable digital transactions
- ✓ Not requiring expensive credentials— such as smartcards, etc.
- The above powerful features of the ID system delivered at a billion-population scale encouraged a plethora of useful applications through high assurance authentication and KYC facility, bringing speed and convenience to various transactions at a small fraction of the earlier cost. All this was possible due to the smart use of cutting-edge technology, be it multimodal biometrics, distributed computing, BI/Analytics, mobile apps, etc.
- This technology is for the 'Digital Inclusion' and India has always been advocating that a digital economy is an important tool for social inclusion for future cooperation towards digital inclusion and social empowerment.
- Aadhaar and UIDAI have always been at the forefront of developing and/or using state-of-art technologies so as to ensure that they are successfully meeting their mandate of providing reliable, secure, resident and industry-friendly identity solutions and services.
- In this context, some of the technologies that have been adopted or are in the process of being adopted at UIDAI include the following:

- i. Unified my-Aadhaar portal for a one-stop experience for users for all Aadhaar services in regional languages;
- ii. Multiple services on mAadhaar mobile application;
- iii. Use of secure QR code and offline e-KYC for offline verification of Aadhaar;
- iv. Introduction of Virtual ID, Aadhaar Lock, Biometric Lock for securely using Aadhaar for various services;
- v. Integration with Digilocker for consent-based fetching of resident documents as well as for address update on other identity documents based on address on Aadhaar;
- vi. Extensive use of AI/ML for ‘liveness check’ of residents’ biometrics and for document validation;
- vii. State-of-the-art UIDAI’s own Private Cloud Infrastructure;
  - ✓ Indigenous development of Automatic Biometric Identification System (ABIS) to reduce dependencies on proprietary solutions;
  - ✓ Integration with ISRO for location-based resident services;
  - ✓ Inspection Portal for automating inspection of Aadhaar Centres by UIDAI;
  - ✓ Research is underway in newer technologies like Blockchain-based Identity solutions, IoT, Confidential Computing, AI-based Fraud Analytics, quantumresilient cryptographic solutions, etc.

### Technology Innovation in Authentication

- The core strength of Aadhaar is its ability to be authenticated anytime and from anywhere. This completely digital and portable nature of Aadhaar makes it a ready candidate for an enormous number of applications and use-cases, for example, Aadhaar-authentication based digital payments such as those in the Direct Benefit Transfer (DBT) and last-mile branchless banking, social welfare benefit/service delivery such as PDS, etc. Some of the innovations that Aadhaar has been able to bring to its Authentication landscape are as follows:

### Face Authentication:

- This is a recently-launched indigenous smartphone-based solution for Aadhaar Authentication using the ‘Face’ modality.

- It is contactless and has a ‘liveness check’ built into it. This makes it more secure and reliable. It extensively employs AI/ML for ensuring the ‘liveness’ of the modality captured as part of authentication.

### **Iris-based Aadhaar Authentication:**

- This has been in place for a long time and is being vigorously promoted now due to its inherent strengths which came to the fore, especially during Covid-19.
- Just as face-modality, it is contactless and more secure, and also more reliable than a fingerprint-based authentication, especially for people with worn-out fingerprints.

### **Fingerprint Image Record (based) authentication:**

- Fingerprint Image Record is being launched for ensuring the ‘liveness’ of the fingerprints captured and to check cases of possible frauds via fingerprint cloning, etc.

### **More secure registered devices for enrolment and authentication:**

- For added security, the new devices shall have encryption of Identity Information captured at the device chip/hardware level.

### **Security of UIDAI Infrastructure**

- UIDAI has conjured up state-of-the-art techniques and technological advancements in Information Security and conceptualised models and frameworks to explore some of the best ways to protect the integrity of the system from such actors and at the same time ensure its availability to legitimate users.
- Aadhaar has a multilayered secure architecture. UIDAI-CIDR is ISO 27001 certified for Information Security. UIDAI is also certified for ISO 27701 for privacy protection as an extension to ISO 27001. Regular security feeds from government security agencies are assessed for security strengthening.
- UIDAI also ensures continued adherence and compliance to the best practices in security by Aadhaar ecosystem partners through regular security audits of the partner infrastructure and processes.
- Digital Technology is meant to be used by the government and the public sector to a) Ensure transparency and accountability of governance, and b) Meet the increased



demand for digital services among citizens, to provide more simplified and high-quality services.

- UIDAI has always been steadfastly aligned to this core objective. It has always remained abreast with the latest advancements in technologies that have a bearing in the Indian context and specifically in the context of providing digital-identity-led services to its people.
- Towards this, UIDAI plans to keep breaking newer grounds in its digital journey by making the right partnerships with industry, academia, and the residents who form the centre of its existence.

**MISSION KARMAYOGI:  
FUNCTIONS OF CAPACITY  
BUILDING COMMISSION (1/2)**  
New Paradigm of Capacity Building

- Suggest policy intervention in areas of HR Reforms
- Functional supervisory role over all central training institutions to harmonise training standards
- To formulate Mid-Career Training Programme (MCTP) for all services and to set norms for the same
- Create shared learning resources including shared faculty and resource hubs
- To set norms for horizontal & common mid career training programs for all civil servants

[f](#) [t](#) [i](#) [o](#) /BJP4India [www.bjp.org](#)

## Capacity Building Commission

- The capacity of Civil Services plays a vital role in rendering a wide variety of services, implementing welfare programmes, and performing core governance functions.
- A transformational change in Civil Service Capacity is proposed to be affected by organically linking the transformation of work culture, strengthening public institutions, and adopting modern technology to build civil service capacity with the overall aim of ensuring efficient delivery of services to citizens.

- Mission Karmayogi aims to prepare the Indian Civil Servants for the future by making them more creative, constructive, imaginative, innovative, proactive, professional, progressive, energetic, enabling, transparent, and technology-enabled. Empowered with specific role competencies, the civil servant will be able to ensure efficient service delivery of the highest quality standards.
- Under the Mission, the Capacity Building Commission was constituted through the Gazette of India on 1 April 2021. As the custodian of the civil services capacity building ecosystem, the commission is mandated to perform the following functions:
  - a. Facilitate preparation of Annual Capacity Building Commission Plans of departments, ministries, and agencies.
  - b. Make Policy recommendations to DoPT on personnel/HR and Capacity Building.
  - c. Evolve a harmonious de-siloed approach to improve civil service capacity.
  - d. Analyse learning/competency-related data from iGOT-Karmayogi, an online training platform.
  - e. Drive standardisation, harmonisation, and shared understanding of Capacity Building activities.
  - f. Create shared learning resources, including internal and external faculty and resource centers.
  - g. Exercise functional supervision over all Central Training Institutions.
  - h. Undertake an audit of Human Resources in the Government and outcomes of the Capacity Building efforts.
  - i. Approve Knowledge Partners and Content Validation mechanism for the training of civil servants.
  - j. Organise a global HR Summit to bring best practices of human resource management to the governance in India.



## NFT Explained

### Why You Should Know?

- Great artists focus their energies on one thing: creating their next masterpieces. Musicians and composers spend months in search of the perfect lyrics or melodies.
- Architects ensure the minutest of details in their building plans. But the artists have to find a way— a platform to showcase their piece of art and to monetise it in order to earn a living, and to ensure the protection of the source, the ownership, the copyright, and its future value.
- This is where the intermediaries like art galleries, music labels, concert promoters, etc., come in, where on one hand they market the skills of the artists and on the other, help them monetise their artwork for a healthy cut of profits— sometimes even ownership of the artist's work.
- Over a period of time, the intermediaries have become powerful, wealthy, and yet not very successful in protecting the provenance and copyright of the artworks that were the result of painstaking work of the artists.
- With the invention of NFT, a technology that allows creators and artists to bypass the intermediary altogether, decentralisation has taken place and has allowed artists and creators to gain control— not just over the financial value of their artworks but also over the ownership and copyright of the same.
- As the NFTs are dealt with in cryptocurrency jargons, scaring off non-techies, they are not understood properly and still not talked about or considered mainstream, due to, first, the fear of the unknown— popular publications' inability to accept an ever-evolving technology as an important one, lack of knowledge thereof, mainly due to the jargons associated with the technology, second, the fear of failure— as the NFTs are

based on the decentralised cryptocurrencies where the control does not remain with any financial institution constituted by Government but is purely driven by market forces and volition of the 'people' (or computers connected in a Blockchain Network) and the last bubble burst of Bitcoin witnessed in the years 2017-18, the scepticism prevails in accepting any technology or platform dealing entirely in cryptocurrencies.

### What is an NFT?

- **At a first glance, NFT does sound complex and difficult to comprehend, but it is relatively simple. The NFT stands for Non Fungible Token, and to understand it better, let us quickly break down these words.**
- **First of all, Token: Here, Token can be anything— a piece of art, a musical melody, a video, a game, or even a physical object. There are many things which can be and have been converted into Tokens, e.g. Concert Tickets.**
- **These tokens are mostly PNG images, animated images (GIF), MP4 Audio tracks, or videos. So a question naturally arises is, how is an image on the internet different from an NFT? And the answer is that, an image becomes an NFT when it is stored on an online network of computers called Blockchain, and a unique serial number is assigned each time a Token is placed on the Blockchain Network. Each NFT has its unique serial number and that also makes the Token Non-Fungible.**
- ♣ **The next word, Fungible means that in simple language, if an object can be replaced by another object, it is called Fungible. E.g. one Rs 500 note can be replaced by another Rs 500 note.**
- ♣ **Its value is not going to change even after the replacement. Therefore, it is a Fungible object. On the other hand, something having a value of personalised or unique nature that cannot be replaced by another object makes it a Non-Fungible object.**
- ♣ **Imagine your cellphone having scratches on the front screen, when sold online will be unique and will have a completely different value than any other cellphone of the same model being sold by another person.**



- ♣ **A celebrity's laptop will probably have more worth than someone else's, even if it's the same model and brand. Similarly, one NFT cannot be replaced by another NFT, because even if it is the same image, each copy of this image has its unique serial number and therefore, has its own value, making it unique.**
- ♣ **Combining these words, a Non-Fungible Token can therefore be described as an object having a unique serial number, stored on the Blockchain Network.**

## Why choose NFTs?

- The question that naturally arises is, why buy/sell NFT when you already have these objects like image artworks, music tracks, MP4 videos existing on the internet and/or with the intermediaries like art galleries, music labels, streaming platforms? To answer this: All artists and creators can now easily display and monetise their work.
- Artists can sell their work directly as an NFT to a consumer and make a profit, this leads to less dependence on traditional art galleries and auctions. Royalties can be included, which means that each time their NFT is sold, the artist can receive a certain percentage of the price at which the consumer decides to resell it.
- Royalties are paid to the original artist each time the NFT moves from consumer to consumer. If their art were sold in the traditional way, the revenue from secondary sales would not occur, making NFTs particularly beneficial to creators.
- NFTs ensure ownership of a digital object, thanks to the Blockchain. There are more benefits of NFTs. To name a few important ones: Firstly, each NFT is unique, the only one of its kind.
- It is impossible to create another NFT with the same serial number. Everything is verified by the blockchain and can be seen by everyone. Not only that, but the owner of that Token on the Blockchain will have full commercial copyright to use that image and asset.
- Secondly, because they are unique and cannot be copied, they are scarce. Most of the time, there are very few NFTs from an artist or seller. Therefore, you can safely assume that you will be one of the few people in the world to own a collectible that can then be resold.

- Thirdly, no one can change the metadata of the token, no one can delete your image or the name of the token. This means that it will never change, it will never be deleted, it cannot be removed from the blockchain, hence making it immutable.
- Apart from these benefits, NFTs are collectible, downloadable, permeant, and resalable. In short, NFTs certainly have more value than one would assume at first glance.

## How do NFTs Work?

- These NFTs are bought and sold using cryptocurrencies like Bitcoin, Ethereum, XRP, Dogecoin, Apecoin, Binance coin, WRX, etc. The first digital cryptocurrency that tops the list is certainly Bitcoin.
- The second most popular cryptocurrency is Ethereum and it has its own Blockchain Network, enabling the NFT sale and purchase. Opensea is the first, largest, and internationally popular platform for selling crypto goods including NFTs. In India, WazirX is a popular cryptocurrency exchange which also has its own cryptocurrency called WRX.
- Cryptocurrencies are fungible. One Bitcoin can be replaced by another Bitcoin and the value will be the same. Just the way one Rs 500 can be replaced by another Rs 500 note.
- On the other hand, each NFT is different from another NFT because it is unique, having a unique serial number on the Blockchain Network. Therefore, each NFT is one of a kind and can have a completely different value.

## NFTs and its Categories

- The most popular category in the present day is the category of visual art as NFTs: The community of creators, developers, artists, and merchants have started pushing their art into the new territory of NFTs.
- As discussed earlier, each NFT has a unique serial number as an identifier and this allows the visual art to be recognisable in its uniqueness, cannot be copied, and therefore, the creators have control over their artworks saving them from plagiarism.

- It all started with CryptoPunks, a set of 10,000 randomly generated pixelated images that proved the demand for digital ownership of non-physical objects and collectibles in 2017, and the market has been evolving rapidly ever since.
- Music as a category of NFTs is steadily evolving. Many artists are taking advantage of the NFT opportunity by offering their audiences limited edition unreleased tracks.
- The benefit of offering Music as NFTs is that the intermediaries like Music Label companies have been removed from the equation, offering the chance for the artist to sell their products directly to the audience, while getting closer to their community.
- NFTs are becoming increasingly popular in the Domain Name business also. Crypto domains are Blockchain addresses that allow, among other things, to receive payments in cryptocurrencies.
- It is similar to the late 1990s' '.com' web craze. Buyers have started purchasing Blockchain Domain names which are being sold as NFTs which typically end with '.eth' or '.crypto'.
- Blockchain developers, speculators, and NFT traders have already purchased Blockchain Domain names of important global brands. It remains to be seen how much such brands are willing to pay to buy back their domain name.
- Another popular category of NFTs is Metaverse. It is a virtual world powered by the Blockchain where users can create and trade digital assets, play games, buy plots of land, display art in galleries, etc.
- Metaverse has as many utilities as far as the imagination can reach. Recently, Facebook has renamed the company name to 'Meta' to affirm its ambitions to become a major player in this category by presenting its Metaverse project. Popular singer Daler Mehndi made headlines when he bought land in the metaverse and named it 'Balle Balle Land'.
- When all categories of entertainment and utility are entering into NFT space, Sports cannot be left behind.

- Sports brands have some of the most valuable intellectual property in the world. Sports teams and related companies have made headway into the NFT world and have started selling items to their millions of fans.
- The Lille Football Club has released an NFT collection that represents their four French Championship titles. On the NBA Top Shot platform, video excerpts of basketball games, although accessible to all on YouTube, are traded at a premium. The secret is that they are sold with a certificate of authenticity, thanks to NFTs.
- A similar category to Sports is the Events, as with the adoption of NFTs in the Event industry like Concerts, Cinema, Theatre, museums, etc., it is only a logical step that the tickets to access stadiums would be sold via NFTs in the near future.
- Collectibles can be described as yet another category of NFTs. Some of the popular examples include the Bored Ape Yacht Club, Cool Cats and CryptoPunks collections. Recently, the Prime Minister of India gave away Blockchain-based digital degrees at IIT, Kanpur. They are nothing but NFTs, which are unique and hence, unforgeable.
- Building a Community around NFTs is yet another category. Tourism-related brands like Zostel have launched their NFTs in order to have a close community of travellers and backpackers being provided exclusive benefits upon purchase of their NFTs.
- One might ask that all the benefits and features of NFTs are fine and NFTs might benefit artists and creators, but how does it affect a layman in day-to-day life? To elaborate on this, let's go back to the times when Twitter was put in the public domain. Twitter founder and CEO Jack Dorsey tweeted the first tweet on the microblogging platform in 2006, a short text that said "just setting up my twtr."
- While the tweet will continue to exist on Twitter, it has been sold as an NFT to Sina Estavi, CEO of Bridge Oracle, for USD 2.9 million. Estavi would get the NFT as "signed and verified by the creator."
- The USD 2.9 million raised was then donated to charity which specialises in providing financial resources to the poor and its Covid relief programmes in Africa. To sum it up, people have always been collecting different objects in various formats, from World War weapons to sneakers to 1st generation iPhones.

- So, it should come as no surprise that there is a market for collectibles in digital form. Not only that, this digital form not only provides and ensures uniqueness, authenticity, and immutability, but it also benefits the creators (the seller) and the collectors (the buyers) in numerous ways.

## Way Forward

- While the benefits of using NFTs are ample and the real-life use-cases are on the rise day by day, understanding the jargons around this technology would only benefit one to adapt to the remarkable shift that is taking place all over the world in terms of how existing currency and financial systems are looked at, how art is perceived and how parallel universes are being set up where people buy and sell pieces of land.
- However, if we have to talk about its future, the beauty of the NFTs is that their future isn't chiseled in stone. Nobody knows what will become the most prominent use of NFTs.
- The risk-takers are writing the future of NFTs— trying radical applications and taking NFTs to places we hadn't thought of. But one can safely say that the sky is the only limit for NFTs, or the sky exists in the Metaverse.
- The NFT-fication of everything will take place in the years to come and anyone can participate. The future of NFTs is being written as we speak.





# Tech-Innovation in Banking

## Why You Should Know?

- A decade ago, Indian banks mostly followed global banks in terms of innovation, but today the whole scenario has changed.
- Nowadays, in the Indian banking sector, one agenda which is regularly discussed in the meetings of the 'State Level Bankers' Committee' (SLBC) of all the States is how to provide banking services to the general public in a timebound, coordinated and efficient manner, and through the latest technologies.
- Due to these coordinated efforts, digitisation in the Indian banking sector has started taking place at a faster pace.
- The UPI-based remittance and Aadhaar Enabled Payment System (AEPS) in India are far ahead of the technologies adopted in many western countries.
- Taking a step further, banks in India today are actively engaged in finding blockchain-based solutions for international remittances, syndicated loans, KYC, etc.

## Digital Transformation: Key Milestones

- Banking system in India, established 252 years ago, has left its traditional way of functioning far behind and emerged in a new avatar with the advent of new technologies.
- Long queues at the bank are a thing of the past; people carry their banks in their pockets and can electronically transfer the money in minutes. Overall, technology in the banking sector has made citizens self reliant.
- After the nationalisation of banks in 1969 and particularly after the liberalisation in 1991, the era of competition and providing the best facilities to the customers started in the banking sector.

- Along with this, the journey of the internet began. Although it was being used less frequently, the possibility of using the internet on a global scale was seen to be of great help in advancing the banking sector.
- Even though the first business ATM in the world began operational in 1969 in the US; HSBC, the first private sector foreign bank in India, opened the first ATM in Mumbai in 1987.
- While ICICI became the first bank to introduce internet banking in India, the public sector bank, the Central Bank of India, was the first to offer a credit card facility in India.

## Ease of Transactions

- Earlier, a lot of time used to be wasted on withdrawal and sending money. ATMs, Internet Banking, and Credit Cards have made it so easy now.
- There was a time when bank unions used to go on strike on the pretext of using computers in the banking system, while today, most of the Indian banks provide all banking facilities to their customers on mobile phones.
- When technology breezed in, paperless banking caught on, and today the situation is that Electronic Funds Transfer (EFT) has overtaken paperbased fund transfer.
- Data available from the Ministry of Electronics and IT shows that in comparison to digital transactions of Rs 5554 crore in 2020-21, banking transactions worth Rs 7422 crore were done through digital mediums during 2021-22.
- In recent years, several steps have been taken by the Government of India to use banking technology to simplify the banking system. The Government's ambitious Digital India Mission and Payment System laid the digital economy's foundation.
- While Rupay, Kisan Credit Card enabled farmers to engage in cashless transactions, General Credit Card enabled people involved in occupations other than farming. Since its inception, NABARD, the country's apex agriculture and rural development bank, has provided financial support to enable cooperative and regional rural banks to issue EVM chip-based Kisan cards.

- There is a need to establish a system in rural India so that farmers can use these cards not only for cash withdrawal but for most digital transactions; hence NABARD is regularly giving grants to the regional rural banks and cooperative banks to make available Point of Sale Terminals (PoS) in villages across India.
- AEPS is crucial in the financial inclusion of people not covered by formal banking. A financial incentive of 0.5% of the transaction amount and a maximum of Rs 10 per transaction to promote Aadhaar enabled PoS transactions upto Rs 2000 is also provided to encourage digital transactions.
- The Direct Benefit Transfer System (DBT), introduced in January 2013 to directly transfer the benefits of the social security schemes to the accounts of the general public without any financial leakage, is also proving to be very effective.
- Another significant step was the establishment of a Payments Bank by the Reserve Bank of India, which aimed to increase the access of small traders, lowincome families, migrant workers, etc., to payments, remittances and other financial services through secure methods using technology.
- In Green Channel Banking, you only have to enter the account number where you want to transfer money, and the amount in the swipe machine. At your end, you deposit cash in the bank, and the money gets deposited in the particular account there.
- ATMs: In the beginning, only money could be withdrawn from ATM, but now money can also be sent to anyone's account through ATM. Also, many banks have started the facility of deposit through ATMs; only the account of the sender and the receiver should be in the same bank.

### **From Banking Correspondent to Mobile Banking:**

- Banking Correspondents are important for unskilled workers, labourers, and less educated people in rural and urban areas. They help people in several ways, including depositing or remitting money and opening an account.
- A banking correspondent can also be a grocery store or other retail outlet in the neighbourhood. With new technology and increasing competition, tech-savvy people

have easily shifted to their mobile phones for banking purposes, and banks are constantly upgrading their technology to make it more convenient.

### **New Mobile Banking Apps:**

- Banks have launched different iOS and Android phone Apps. Using Mobile Banking, one can do everything— funds transfer, getting the bank statements, mobile recharge, and train or hotel booking directly through the bank's App.

### **NEFT-RTGS:**

- National Electronic Funds Transfer (NEFT) and Real Time Gross Settlement (RTGS) are the facilities with the help of which individuals, companies, and firms can easily transfer money from one bank to another.
- Many banks in India operate as banking agents for international money transfers that can now also be transferred on mobile.
- National Automated Clearing House (NACH): Launched in December 2012, the National Payments Corporation of India (NPCI) runs this service. This service also plays an important role in data management, along with transparency and security.

### **Core Banking Solution (CBS):**

- Today, the facility of Core Banking Solution is being provided all over the country by commercial banks and cooperative banks. As a result, anytime, anywhere, banking has made life easier. This trend points towards the fact that these digital solutions are gaining momentum as mobile banking customers increase.
- Though the cutting-edge and innovative banking, technologies are still in experimental stages, customers over the next five years, will be able to get new banking experiences through voice, gesture, virtual reality, augmented reality, movement of the eyeball, finger-based payment, interactive holographic mannequins, etc.

## New-Age Innovation

### Robotic Process Automation:

- With the rapid growth of the digital economy, the amount of unstructured data processed by banks is increasing.
- It is not just banking transaction data but also behavioural data which banks can adopt to guide their customers to a new world of innovation. By combining various technologies that enable cognitive and robotic processes, bankers can make quick, large-scale, and quality decisions by predicting customers' actions. Smart Virtual Assistants are helping customers by handling banking transactions and providing relevant information. Robotic process automation uses bots to do repetitive tasks without human intervention in a more efficient manner.

### Data Analytics:

- Today, banks are meeting customers' needs faster by analysing their business data. Technology and digitisation have enabled the banking sector to make informed decisions with actionable insights in real time, face market competition, understand future launchable products and ensure customers' satisfaction.

### API Platform:

- Today, through the API Platform, banks are engaging with Fintech, which allows them to become a platform on which customers and third-party service providers can connect to deliver a flexible and personalised experience to the end-user.
- API Banking Platform is designed to work through Application Programming Interface, which is a software intermediary that allows two applications to talk to each other.
- They allow banks to adopt entirely new business models and use new technologies such as blockchain at a lower cost. APIs also help banks to make their systems future-proof.



### Cyber Security:

- The banking industry deals with sensitive and personal information, so cybercriminals are in ambush for such information. With the increasing use of technology in banking, cyber risks are also rising. Banks are becoming more alert concerning cyber security.
- They are gradually implementing advanced, analytical, real-time monitoring and biometrics, and behaviour analysis software to detect threats and prevent them from disrupting systems. They are also using anti-hacking tools that provide networklevel security.

### Cloud Computing:

- Cloud Computing is another technological advancement revolutionising the banking sector. Cloud is an important tool of the service delivery model and enables banks to find new business opportunities and access new distribution channels.
- By leveraging cloud-based services, banks, while ensuring the security of customer data, can reduce data storage costs by saving on capital and operating expenses. Cloud computing also promotes secure online payments, digital money transfers, wallet payments, etc.

### Biometrics:

- Companies are inventing new payment systems due to a gradual decline in dependence on cash. Customers can pay within seconds by simply verifying their identity through their fingers or face.

### Chatbots:

- As voice-based interactions with customers continue to grow, banks are rolling out new financial chatbots that save up to 4 minutes per transaction. Banks are also getting feedback from customers immediately and at a nominal cost.

### Wearable Smartwatch:

- These give customers a unique digital payment experience. A rapid rise in their usage amongst the Millennial and Gen-Z generation will surely revolutionise the digital payments arena.

### **Zero-Trust Security Model:**

- Banks and customers are losing their trust in the old IT models. The zero-trust security model is the way to deal with the growing cyber risk. It ensures strict adherence to the user and device authentication across the network without relying on implied trust.

### **The Way Forward**

- Considering the importance of digitisation as the need of the hour, especially in the pandemic era, all Indian banks, government or private, are now focusing on the digitisation of loan products after the digitisation of payments systems.
- The country's Central Bank, RBI, has also set up a Fintech Department with effect from 4 January 2022, which along with promoting innovation in our banking sector, will focus on the challenges and opportunities which keep coming in the banking sector through technology every now and then, and this department will continue to engage in research to find their solutions.



## Accessible Healthcare to All

### Why You Should Know?

- Ayushman Bharat Pradhan Mantri Jan Arogya Yojana enshrines to accelerate India's march toward achieving Universal Health Coverage (UHC) as listed in The National Health Policy (NHP) of 2017.
- AB PM-JAY is not India's first tryst with healthcare insurance. Due credit must be given to predecessor schemes such as Rashtriya Swasthya Bima Yojana (RSBY), States schemes like Aarogyasri in Andhra Pradesh, Rajiv Gandhi Jeevandayee Arogya Yojana (RGJAY) in Maharashtra.
- However, in terms of scope and scale, AB PM-JAY simply dwarfed all existing healthcare insurance interventions. It is for the first time that we now have a health insurance scheme with a pan-India presence being implemented almost everywhere in the country.
- As of 1 April 2022, Ayushman Bharat PM-JAY in alliance with State health schemes covers a beneficiary base of more than 14 crore families (70 crore individuals). Almost 18 crore individuals have been identified under the Scheme and been provided with an Ayushman card.
- AB PM-JAY has facilitated almost 3.28 crore hospitalisations, providing treatment worth over Rs 37,600 crores. All this has been achieved in a little over 3.5 years and amidst the greatest global pandemic in recent times.
- As I reflect on the trajectory of Ayushman Bharat PM-JAY, the Scheme's success is mounted on the vision of the Prime Minister of India and the versatile policy framework conceptualised by the Cabinet. This policy framework crystallised the guiding principles behind Ayushman Bharat PM-JAY which are as follows:

## Comprehensive Healthcare Benefits

- AB PM-JAY was launched with 1,393 treatment packages covering treatment for various medical specialties like oncology, neurosurgery, cardiovascular surgery, etc., upto Rs 5 Lakhs per beneficiary family.
- Over multiple package revisions, this was subsequently increased to 1,670 treatment packages. The benefits package under AB PM-JAY was comprehensive, covering pre and post hospitalisation expenses.
- Additionally, all pre-existing conditions were covered from the first day of the policy period. This ensured that beneficiaries could avail treatment under AB PM-JAY without worrying about co-payments or exclusions.
- The health benefits package was also made portable across the country, empowering beneficiaries from the remotest villages in India to seek treatment at the most advanced healthcare facilities in cities such as New Delhi, Mumbai, Chennai, and Bengaluru.

## Convergence & Integration

- AB PM-JAY was never about reinventing the wheel. It was about learning from past experiences and making well-adjusted changes to the current scheme construct. One of the key insights that emerged from stakeholder consultations was about forging stronger partnerships with the States.
- Accordingly, under AB PM-JAY, considerable flexibility was provided to the States and Union Territories in choosing their mode of implementation, beneficiary database, and creating the network of hospitals.
- Further, National Health Authority (NHA) diligently pursued convergence with the existing State-based schemes. Currently, AB PM-JAY is implemented in alliance with more than 25 State-specific health schemes. This has ensured that the Scheme is operationalised in a manner best suited to the local context.
- State Governments were encouraged to set up State Health Agencies (SHAs) for better oversight of the Scheme at the State level.

- Additionally, District Implementation Units (DIUs) were set up in over 600 districts across the country. This ensured that the administrative reach of AB PM-JAY extended to the beneficiary's doorstep.

### Ensuring Equity in Access to Healthcare Services

- **Under AB PM-JAY, the renewed impetus has been given to extending the Scheme benefits to the marginalised sections of society covered under the Socio-Economic Caste Census database.**
- **Likewise, the Scheme has adopted an enlightened approach towards ensuring gender-specific equity. The erstwhile RSBY Scheme had mandated a limit of adding up to 5 family members.**
- **Unfortunately, this led to the exclusion of female members of the household, especially the girl child. However, under AB PM-JAY, this capping was done away with. It's a matter of great pride for me to say that gender parity has been achieved under AB PM-JAY. Women account for approximately 50% of Ayushman cards generated using the NHA IT platform and 47% of authorised hospital admissions.**

### Robust, Scalable, and Inter-operable Technology Platforms

- One of the problems that afflicted in the past was fragmented IT systems for the schemes like AB PMJAY. This led to a lack of visibility into the last-mile implementation of the Scheme and created fertile ground for irregularities and fraud.
- Therefore, under AB PM-JAY, a highly versatile technology platform was developed to aid in beneficiary identification, transaction management, and hospital empanelment.
- This award-winning IT platform is now active across 26 States and UTs. As a result, SHAs and NHA have gained granular insights into the Scheme to aid in evidence-based policymaking and necessary course correction, where required.
- Furthermore, NHA also leveraged technology to institute robust anti-fraud protocols. A National Anti-Fraud Unit (NAFU) was set up with institutional support from the



multi-lateral development community. This enabled NHA and the SHAs to address fraud and address beneficiary grievances.

## Public and Private Partnership

- Under AB PM-JAY, both public and private hospitals have been empanelled for providing healthcare services to the Scheme beneficiaries. The participation of the private sector has increased avenues for the Scheme's beneficiaries to seek treatment and concurrently reduced the burden on tertiary care facilities in the public sector.
- At the same time, public sector hospitals also stood to benefit from the Scheme. Under AB PM-JAY, it was ensured that public hospitals would be equally reimbursed for their services and at the same rates as that of private hospitals.
- This delineation of the Government's role as provider and purchaser of healthcare services has allowed for the monetisation of healthcare services that were hitherto provided free-of-cost.
- This has supported public sector hospitals to create a pool of untied funds that could be sustainably invested in infrastructure and human resources. The complementary role of the public and private sector hospitals has been vital in ensuring that the Scheme implementation proceeds seamlessly.
- In order to make AB PM-JAY more accommodative for different types of stakeholders, the following policy adoptions are being processed for implementing radical policy changes:

## Health Benefit Packages 2022

- Since the inception of the AB PM-JAY Scheme, NHA has made several changes in the constituents and prices of its Health Benefit Packages (HBP).
- There has been a transition from HBP 1.0 (September 2018) to HBP 2.0 (November 2019), HBP 2.1 (November 2020), and HBP 2.2 (November 2021). Recently, the HBP master has been reviewed and revised and therefore, HBP 2022 was launched.
- The rationalisation exercise for revision to 'HBP 2022' comprised of an extensive review of current Scheme performance in terms of its utilisation and related issues, consideration of cost evidence to determine the variation in cost and price, an

exhaustive consultation with expert committees in different specialties, inputs from State Health Agencies, hospital associations, and other stakeholders.

- The new version has added 365 new procedures taking the total package count to 1949 and also has included high-end procedures like Bone marrow transplant, Cochlear implant surgery, and several Interventional Radiology procedures.
- The revised package has a new specialty of Palliative care also added in addition to rationalising the existing procedure rates. With HBP 2022, differential pricing is being introduced for the first time under the Scheme, based upon the type of city and level of care.

### **International Classification of Diseases (ICD-11)**

- AB PM-JAY has recently completed three years, and NHA as part of a new initiative has taken steps to strengthen patient classification and provider payment systems through ICD-11 (International Classification of Diseases)/ICHI (International Classification of Health Intervention) for AB PM-JAY Scheme using DRG (Diagnosis Related Groups).
- A lot of work has already been initiated and a detailed plan has been developed. Experiences from other countries and health systems will always help us shorten our learning curve.
- The ICD-11 costing tool is easy to use. The smart search option of ICD tooling with phonetic or spelling errors, unspecified and other specified diagnosis is an incredibly helpful endeavour.
- ICD-11 & ICHI tooling infrastructure along with the three specific modules have been prepared for each cluster to do the coding exercises, which include the first two modules for easy and straightforward coding exercises and module#3 for more typical and multiple diagnosis-based problems to solve. The coding platform provides more options for post-coordination and laterality.
- This IT integration will have the standardisation of Scheme nomenclature as per international standards. AB PM-JAY Scheme has the country's largest data on health insurance/assurance sector, hence this will help in rich data mining and useful policy

insights, which lead to evidence-based decision making. Key challenges will also include coding accuracy and compliance.



## Diagnostic Related Groups (DRGs)

- AB PM-JAY is the first insurance Scheme in India and amongst the first few in the world to implement a provider payment mechanism through Diagnosis Related Grouping (DRG).
- The DRG system entails that the hospital gets paid based on the admitted patient's diagnosis and prognosis, rather than paying on the basis of booked HBP.
- This will address today's hospital concerns that package costs do not address/incorporate complications and co-morbidities.
- For example, if a hospital can treat a patient while spending less money than the DRG payment for that illness, the hospital makes a profit.
- If, while treating the hospitalised patient, the hospital spends more money than the DRG payment, the hospital will lose money on that patient's hospitalisation. This is meant to control healthcare costs by encouraging the efficient care of hospitalised patients.

- With DRG implementation, packages would not be selected by hospitals but instead assigned by a grouping algorithm using patients' underlying diagnosis and procedures which will be beneficial in many ways like increased objectivity, greater transparency, and workload reduction for pre-authorisations.
- It may create more incentives for increasing quality by providing the 'right' care in terms of length of stay, consumables, and number of tests/procedures.
- DRG can thus contribute to the empanelment of certain specialties like burns, trauma, etc., which at present, hospitals do not want to cater to, due to low payments or multiple specialty approaches.
- Adoption of Diagnostic Related Groups under AB PM-JAY will reduce the abuse of certain specialties and packages based on high volume, high costs, and large variation by making hospital-friendly grouping.
- DRG will also reflect various nuances related to the patient's healthcare needs, including the severity of the condition, the prognosis, how difficult or intensive the treatment is, and the resources necessary to treat the patient.
- The most important part of assigning a DRG is getting the correct primary diagnosis and this is where implementation of ICD/ICHI will play a pivotal role.
- DRGs support the rational use of hospital care as an effective way to achieve a balanced health service system and will be associated with quality assurance mechanisms.

### **Aapke Dwar Ayushman**

- Sustained beneficiary identification drives are necessary to improve the saturation of Ayushman cards and thereby increase awareness of the Scheme.
- Furthermore, there is a positive correlation between Ayushman cards generated and the demand for healthcare services under the Scheme. As a result, one of the key activities that I greenlighted upon assuming charge of NHA was the 'Aapke Dwar Ayushman'.
- Under Aapke Dwar Ayushman, a grassroots network of frontline healthcare workers, Gram Panchayat officials, and village-based digital entrepreneurs were used to

undertake door-to-door mobilisation of beneficiaries across communities. Special night camps were set up for daily wagers.

- These efforts translated into the creation of more than 4.7 crores Ayushman Cards since January 2021, an increase of 55% in the Ayushman cards generated by the NHA IT system. Aapke Dwar Ayushman, therefore, gave a big fillip to beneficiary identification activities under AB PM-JAY.
- NHA is launching Aapke Dwar Ayushman with renewed vigour. This time, we are focusing on States such as Assam, Bihar, Gujarat, and Uttar Pradesh.
- Besides, credit goes to the entire Ayushman Bharat PM-JAY ecosystem consisting of NHA, SHAs, DIUs, Implementation support agencies, Pradhan Mantri Arogya Mitras, frontline healthcare workers, Ayushman Card creators from partner agencies such as CSC/UTIITSL for their tireless support in making AB PM-JAY such a grand success. However, moving forward much more needs to be done to help the Scheme realise its full potential.
- To conclude, AB PM-JAY is a path-breaking intervention to address healthcare delivery holistically. I believe it has the potential to catapult India into the top countries of the world in terms of healthcare that's built on the 3As of Accessibility, Affordability, and Availability. The road ahead perhaps may seem long and not easy. But I believe that difficult roads often lead to beautiful destinations and with our collective efforts and hard work, we can help Ayushman Bharat Scheme touch and save more lives and ensure that no one's health is disregarded.





## Advancements in Medicine

### Why You Should Know?

- Medical technology can save lives, improve the health conditions of individuals and communities and contribute to sustainable healthcare. ‘It is said that the best way to predict the future is to invent it.’
- The past has invented the present, the present is endeavouring to invent the future. Any futuristic technology should be people-centric, for the sake of humanity and its well-being.
- Medical technology has grown by galactic leaps ever since the first invention of a wooden tube by René Laennec, which is the primitive form of the now-familiar stethoscope to amazing adoptions of high-end technology such as Artificial Intelligence (AI), Robotics, 3D printing, Data Science, etc., in almost all the specialties of the medical field.
- Augmented, Virtual and Mixed reality are all technologies which find application in not only diagnostics and therapeutics but also in imparting medical education, thereby making the learning of medicine— fascinating and lively. While AR helps the end-user to have augmented visualisation of the real world, VR shuts out reality and provides wholesome simulation.
- AR finds its application in operation theatres and helps the surgeons to get better visual projections of vital life-saving operating fields. VR can be applied to create simulated environments in treatment protocols in specialties like Psychiatry.
- Mixed reality on the other hand offers cutting-edge technology in medical education tools. Most of the modern education facilities are equipped with 3D image learning.
- An exciting development of New Age Medical technology is the brain implants which create a braincomputer interface wherein ‘a smart chip’ implanted in the human body

can provide a nearly total functional replacement of any lost brain function. (e.g. Retinal and Cochlear implants are already in the market). The futuristic models are brain implant therapies for patients paralysed by spinal cord injury or stroke.

- Cybernetic organisms (Cyborgs) are the leap forward in medical technology, not only in repairing and replacing the lost function but also in enhancing the existing ones. It will create Mini Super Human Powers in selective sensory functions like vision, and hearing (hearing aids powered with AI).
- Memory chips with astronomical memory capacity can revolutionise human cognitive abilities. 3D prints applied in medicine can be used to design anything from a tablet or a capsule in desired shape and size to implants, stents, and prosthetics. The 3D-printed forms ensure superior quality, functionality, and aesthetics.
- These give a wider viewpoint of futuristic technology in medicine. Let us look at certain specialised fields of medicine with a focused perspective.

## **Nuclear Medicine**

- India is a global leader in the medical field— as a knowledge and technological hub in recent times. Dedicated scientists from institutions like the Bhabha Atomic Research Centre (BARC) and the Institute of Nuclear Medicine and Allied Sciences (INMAS) etc., are actively inventing novel radioactive medications that can become a game-changer in the future practice of clinical medicine.
- The human body contains about 20,000 molecules only. Diseases happen whenever there is a random discord amongst them.
- In Nuclear Medicine, we directly visualise, measure, and modify these by administering tracer quantities of medications that emit electromagnetic or particulate radiations, long before they can get clinically manifested as physical disabilities and diseases.
- We can save considerable time and resources involved in diagnosing and treating several dreadful diseases.

- In addition to the conventional radioligands, we now make novel tracers tagged with <sup>225</sup>Actinium, <sup>177</sup>Lutetium, <sup>131</sup>Iodine, <sup>106</sup>Ruthenium, <sup>99m</sup>Technetium, <sup>90</sup>Yttrium and <sup>68</sup>Gallium for diagnosis and treatment in our country.
- AI enables us to reach large volumes of the population with greater precision, handle large volumes of data and deliver personalised medicine.
- Although enormous efforts are being made by these scientific institutions to reach the primary care physicians and the patients, much needs to be done by decisionmakers to translate the real benefits from bench to bedside.

## Orthopedics and Physical Medicine

- New-age technologies have the potential to find solutions for complicated scenarios faced by surgeons. 3D printing has revolutionised treatment in patients with bone loss due to severe trauma, tumours, infections, etc., by producing porous-coated customised implants that help in limb salvage, thereby preventing amputations in several such cases.
- 3D printing can also produce specialised polymer wears to aid people with neurologic illness. Bionic limbs, developed with cutting-edge technologies could give a new lease of life to patients with amputations by giving them functional limbs.
- Genomic sequencing can lead to early tumour detection, identifying implant-associated infections, and specific targeted treatment. AI/Machine Learning has given a deep insight into predicting success/major complications with mathematical models.
- These can predict the patients who are at risk for further revisions and help in patient counselling. Robotic surgery has induced perfection in the positioning of implants in complex arthroplasties that has largely helped in longevity. Advanced antimicrobial nanotechnologies are poised to treat resistant orthopedic infections more effectively

## Critical Care Medicine

- Critical care medicine is one of the dynamic fields with rapid advances, constant transformation by novel technologies, integration of AI support systems with algorithms to detect patient symptoms, and guide treatment with excellent operationalisation across diverse healthcare systems within federated datasets.

- These pandemic years have directed us towards wireless support systems including monitors and wearable devices which help the multidisciplinary team to give inputs without being actually present at the bedside.
- Critical care teaching has shifted to adopt a virtual reality form of teaching where the simulated scenarios create realism, hence enhancing learner competence without compromising patient safety. Simulation is widely being incorporated into the curriculum of teaching institutions, and simulation laboratories have made learning more interesting than the usual classrooms.

### Catering Public Health

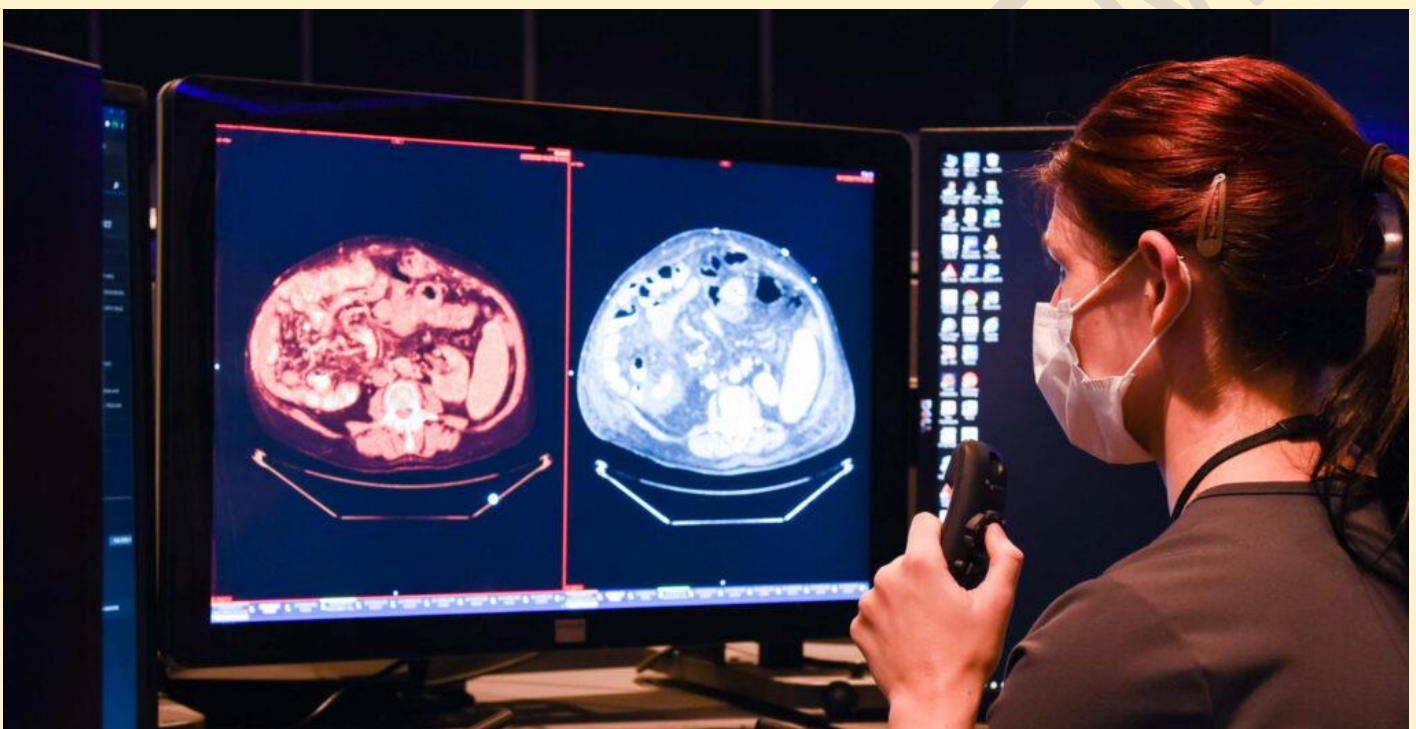
- Public Health's adoption of new-age technologies like AI, High-performance computing (HPC), IoT sensors, and 5G, and ever-increasing ownership of smartphones will result in accurate population data explosion and analysis, transforming public health interventions into more effective, actionable, real-time, personalised and precise 'Health for All' actions. New-Age Technologies like Geospatial Technology, Wearable Technology, Microblogging monitoring, 3D Printing, Telehealth, cloud-based Electronic Health infrastructure, Transportation (drone) Technology, and Internet of Medical Things (IoMT) will work with Public Health by profiling disease and demographic variables, health information pooling, predicting disease severity, public health facilities and services mapping, printing public health supplies to name a few, and this results in decisive and decentralised health intelligence, informed health governance, Intelligent Transportation Systems, streamlining the overall healthcare and ultimately reducing healthcare costs.

### Diagnostic Radiology

- Radiology is a medical specialty that is greatly impacted by the fastpaced technological advancements which include: AI and machine learning algorithms are used to flag abnormal images to expedite the reporting for critical patients.
- Some AI softwares are trained to diagnose common abnormalities. They help to improve the image quality with low radiation dosage, provide diagnostic accuracy,

enhance workforce efficiency, alleviate Radiologist burnout, reduce turnaround time, handle large patient volumes, and provide alerts to the doctor on their mobile phones.

- Radio Genomics is an interpolation of imaging details and genomic data of patients which will help to individualise treatment. Dimensional Printing, Cinematic Rendering, Virtual Reality (VR) & Augmented Reality (AR)— provide accurate anatomic and functional detail that guide complex cardiac procedures and serve as an educational tool. Wearables in Radiology— the Microsoft HoloLens and Google Glass, provide holograms for Interventional Radiology procedures.



## Radiology in Developing Nations

- It is imperative that imaging services reach the large rural population. Mobile imaging units, handheld ultrasound devices, mobile phone-based scanners, and radiology robotic devices will help achieve these Teleradiology
- Services, and enable radiologists in providing expertise to different geographical locations simultaneously. Cyber security helps safeguard the privacy of patient data in conformance with regulatory and medicolegal statutes.



## Endovascular Surgery

- Vascular surgery is an exciting, innovative, and vibrant specialty in today's medical era. The 20th century witnessed a tremendous explosion in the application of minimally invasive, catheter-based interventions in virtually all vascular bed territories.
- Novel devices such as drug-eluting stents, drug-coated balloons, cryoplasty balloons, cutting balloons, and focal pressure balloons have improved patency, and reduced or modified the anatomy of the plaque.
- The advent of IVUS (Intravascular Ultrasound)— the best technology to demonstrate the anatomy of the artery wall, and plaque morphology tailors the treatment of vascular diseases and assesses the completeness of treatment.
- Miniaturised in Vivo Robotic Assistant help to perform minimally invasive surgeries in the abdomen. Exciting development in vascular surgery is the implementation of Electronic Blood Vessels— flexible, biodegradable, and durable. Therefore, the new technologies will be relevant only if the focus is to emphasise, enhance and improve the 'human touch' in Healthcare.



# OJAANK IAS ACADEMY

## Our Selected Students in IAS 2020

Congratulations to Our Toppers

**01** Ranks in Top 10 | **10** Ranks in Top 50 | **26** Ranks in Top 100



**RANK 01**  
**SHRUTI SHARMA**



**RANK 58**  
**FAIZAN AHMED**



**RANK 96**  
**MINI SHUKLA**



**RANK 125**  
**MD. MANZAR HUSSAN ANJUM**



**RANK 133**  
**KISHLAY KUSHWAHA**



**RANK 176**  
**SHREYA SINGHAL**



**RANK 203**  
**MOHAMMAD AAQUIB**



**RANK 270**  
**HARIS SUMAIR**



**RANK 283**  
**AHMED HASANUZZAMAN CHAUDARY**



**RANK 389**  
**MOHIBULLAH ANSARI**



**RANK 447**  
**FAISAL RAZA**

**OJAANK IAS ACADEMY** **CREATED HISTORY**

**SHRUTI SHARMA**  
**AIR - 1**  
**UPSC 2021-2022**

**Pioneer Of Online Classes**

+91 - 8750711100/44  
[www.ojaankedu.com](http://www.ojaankedu.com)



SHRUTI SHARMA (IAS TOPPER) WITH OJAANK SIR

**Now In Karol Bagh-** 18/4, 3<sup>rd</sup> Floor Opposite Aggarwal Sweet  
Near Gol Chakkar Old Rajinder Nagar Karol Bagh, New Delhi-110060

ANDROID APP ON  
Google play

Download App  
OjaankEDU