

3rd Edition
December 2021



CEVs

HORIZON

A Visionaries' Digest



Dear Reader,

Issues of HORIZON are always special to us because they showcase the consequence of the efforts and the wholehearted engagement of the entire team of CEV.

"A magazine—a relevant one—should be a sound, not an echo."
— Tina Brown, *The Vanity Fair Diaries: 1983-1992*

This issue of CEV's HORIZON is meant to be an antidote. It looks at things that affected us during this global pandemic. Adding on, it highlights transforms and inventions that will make our future better than it looks from this precarious moment.

This issue brings with it a bevy of well-researched and structured articles. From the Indian EV Industry to the Economic Impacts of the Global Pandemic, we have included articles from various fields. Whether you are an anime fan or a computer technology enthusiast, we have something for everyone.

Understanding the things that will affect our present and the future will work as a guiding light. With global pollution rising, recognizing environmental friendly alternatives for everyday transportation is the need of the hour. Looking at the Indian automobile industry, electric vehicles could be the next revolution. Equally, revolutionizing technologies are Metaverse and Energy Storing Bricks. The writer takes an in-depth tour of these modern technologies and tries to provide an insight into them.

Social media, the modern era's lifeline, can be a fantastic place, but at the same time, it can have dreadful effects on an individual if he is not cognizant. Apart from the dilemma caused by social media, waste generation and economic ramifications after the global pandemic constitutes a significant concern for modern society. Here the writer tries to analyze both sides of the coin and make you aware of their essential aspects.

Finally, we leave you with a detour of 2021; revisit the year, cherish the moments of achievements, respect the change, and escape to the new HORIZON through words. Hopefully, the research, creativity, and preparation behind CEV HORIZON have created a product of potential value that is worth your time. Your feedback is of importance. Please mail us your queries and feedback through our webpage.

Keep Learning! Keep Hustling!

- Team CEV



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**TECHNICAL
BLOCK**

METAVEVERSE

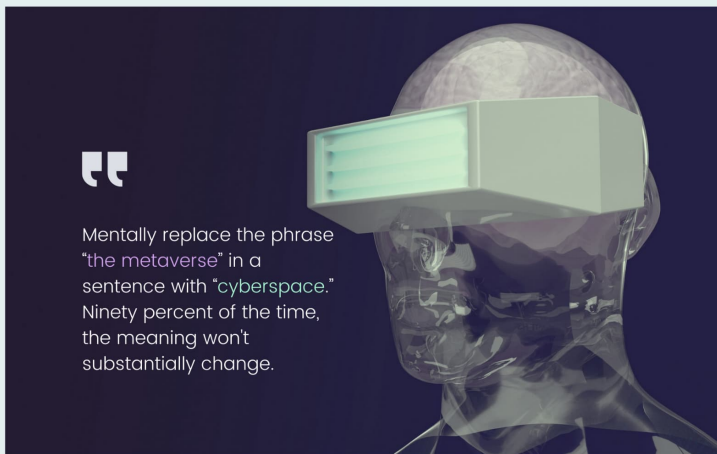
Facebook, Microsoft and others look towards the \$1 trillion dollar 'metaverse' opportunity — but that contradicts the base philosophy behind Web 3.0

CHAPTER

01

In 1992, when the fastest computer was 300 times less potent than today's desktop, Neal Stephenson wrote his sci-fi novel *Snow Crash* where he first coined the term **metaverse**.

The metaverse is a hypothetical virtual world supported by persistent online environments through computer-generated reality based systems, or digital representations of physical objects and activities, already present in some limited form, already present on VRChat or video games, like *Second Life*.



Metaverse now is an idea of extended reality – a combination of augmented, virtual and mixed reality. It can be a shared virtual space that will be persistently online and active with its economy, jobs, shopping areas, and media.

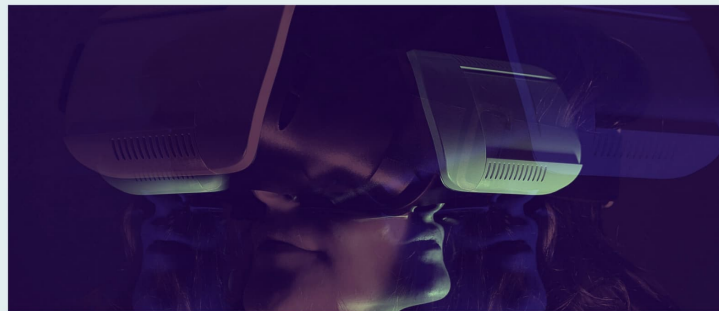
In a metaverse, you can do things like going to a virtual concert, taking a trip online, and viewing or creating artwork. The metaverse also could be a game-changer for the work-from-home shift. Employees could join coworkers in a virtual office instead of seeing them on a video call grid.

Facebook’s attempt to rename is to align itself with the focus on building the metaverse, which CEO Mark Zuckerberg sees as becoming a reality sooner or later. It’s been a factor behind Facebook’s investments in recent years in products such as the Oculus virtual-reality headset.

Video-game developers such as Roblox Corp. and producers including Epic Games Inc. and Microsoft Corp. all are trying to get into the world of the metaverse. The gaming industry has been tackling the possibility of creating it for years. Computer graphics chipmaker Nvidia Corp. wants its Omniverse platform to power some underlying frameworks, as does Unity Software software-maker.

There are still elements that could hinder the metaverse’s integration into mainstream media. The metaverse won’t reach its full potential without ultrafast, low-latency internet. Further, there are, of course, questions regarding what the metaverse will mean for privacy, whether it will be inclusive, and how to mitigate harmful content and environments that could be created.

It could be a technical leap forward akin to the 1990s, when the web evolved from static text and photos on a page to a location to buy a book or watch a movie, and then to a method to attend college lectures and collaborate on product design. Working on a metaverse will affect how we perceive value and demand portability in our virtual lives during the next two decades.



RISE OF ELECTRIC VEHICLES



TESLA

Tesla's Supercharger network is the largest in the world, with over 10,000 charging stations. The company's Supercharger network is the largest in the world, with over 10,000 charging stations. The company's Supercharger network is the largest in the world, with over 10,000 charging stations.

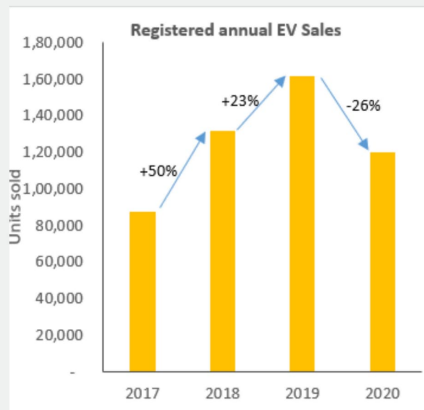
CHAPTER

02

Global pollution is rising, and every effort is being made to reduce CO2 emissions. One such effort is the introduction of Electric Vehicles. Recently, the Indian government mandated the transition from BS4 to BS6, but this isn't enough. EVs could reduce CO2 emissions by 37%.

The global automotive industry is undergoing a paradigm shift in switching to alternative/less energy-intensive options. India, too, is investing in this electric mobility shift. Its transition to shared, electric and connected mobility could help the country save nearly one giga-ton of carbon dioxide emissions by 2030. India also shows significant dependence on foreign countries for oil imports. The government has been implementing new reforms to make the EV ecosystem sustainable and keep in pace with the development of EVs globally.

Talking about the typical invention of electric cars, the credit goes to many people. Still, India's EV journey started way back in 2001, when Mahindra launched the country's first-ever EV, "THE MAHINDRA REVA." As the concern for the environment increases in the 21st century, gas-powered vehicles emit a lot of smoke and are incredibly harmful to the atmosphere. Therefore, the interest in electric vehicles increased too. Since then, sales of EVs in India have kept rising except for the year 2020 that saw the Covid-19 pandemic hampering the sales of automobiles worldwide.



In the first half of FY22, more than 1.18 lakh EV units were sold. Hero, Tata, Mahindra, Ather, Hyundai are the significant stakeholders of the EV industry in India.

Electric cars are still not as cost-effective as in developed nations, but they are still more effective than traditional fuel-based cars.

EV poses many advantages over traditional transportation measures. For instance, if we compare EVs with IC engine cars, EVs have superior energy conversion efficiency. In addition to it, there is no need for bulky components like exhaust, spark plugs, clutch, gears, piston, crankshaft, camshaft, etc.

So low maintenance cost. EVs are much safer as compared to standard IC engine cars because of three main reasons:

1. Because it lacks an IC engine that often transmits crash impact backward due to overly rigid engine blocks, shock waves are primarily transferred to the area right behind the engine.
2. Lower battery placement assures a lower center of gravity, so rollover is less.
3. It also eliminates the need for a highly volatile and flammable liquid.

In addition, EVs cause no emission of hazardous gases and generate less noise pollution.

EVs have more acceleration as electric motors generate maximum torque than IC engines.

- One of the biggest challenges in EVs is the **lack of a charging ecosystem** which leads to than **Range Anxiety**.
- EVs have **High purchase cost** as compared to ICE vehicles. The cheapest EV in India is TATA NEXON that costs Rs 13.9 lakh, whereas the NEXON non EV variant costs Rs 7.3 lakh. The insurance is also significantly higher than an ICE car.
- The most popular batteries used in EVs are li-ion batteries. India does not produce lithium as well as Li-ion batteries. Imported batteries are used in EVs, making them costly.
- The materials used in manufacturing batteries of EVs are very hazardous and should be disposed of properly.
- **Service and maintenance:** EV's repair and accessories availability are in the nascent stage.

The Indian government has launched many schemes that can transition from traditional IC engine cars to EVs plain sail.

- **National Electric Mobility Mission Plan (NEMMP) 2013:** It presents a framework for early adoption of EVs and aims to achieve a 100% EV nation mark by 2030.
- **Faster Adoption and Manufacturing of Hybrid and EV (FAME):** The first phase of FAME was implemented in 2015. FAME II was implemented from April 1, 2019, for three years. It was introduced to reduce the initial purchasing costs and early adoption of EVs and hybrid vehicles. The scheme aims at Technology Development, Demand creation, Charging Infrastructure, Pilot Projects.
- **National E-Mobility Programme (2018):** Launched by the Ministry of Energy, it focuses on the long-term growth of the EV industry, which is done by subsidizing the vehicle manufacturers, fleet operators, and charging infrastructure providers. State policies include exemption from road tax, subsidies to promote EVs, 30% electrification in public transport by 2030.

India has a massive challenge in shifting the transportation sector from ICE to EVs. Government policies need to be updated regularly to take the lead in the EV industry globally. The focus must be on improving the energy efficiency of EVs & also develop a charging ecosystem that can support the growing demand for EVs in the country and make this a reliable and promising alternative to fossil-fuels-based conventional automobiles.

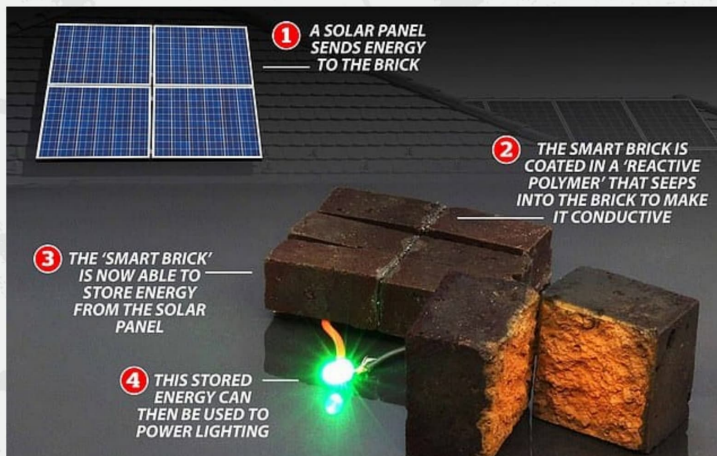


GO ELECTRIC !

ENERGY STORING BRICKS

CHAPTER

03



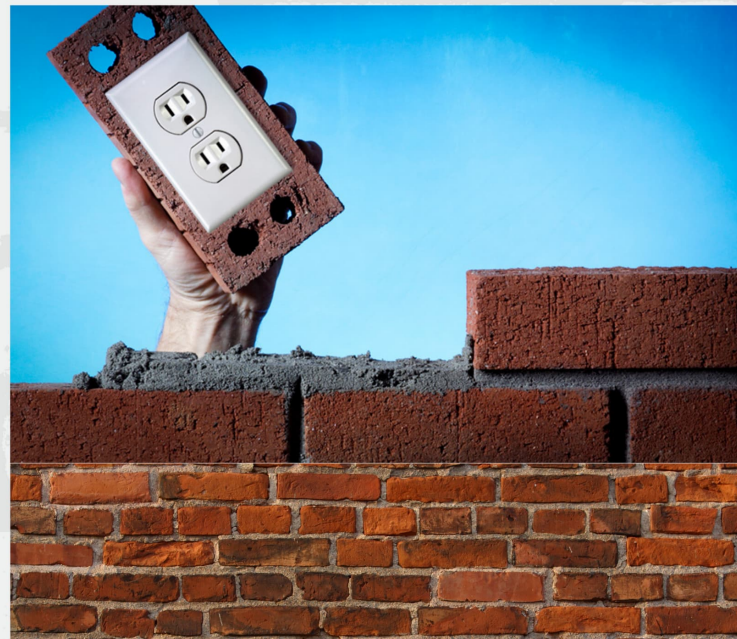
What if an entire home was composed of bricks that could power LED lights and charge phones. Red bricks are one of the most durable building materials used for more than 6,000 years in construction. The term brick initially referred to the block that consisted of dry clay. Currently, bricks are mainly utilized in walls and joined together using mortar. Fired bricks are also highly resistant to weather conditions.

Moreover, they tend to absorb heat transferred during the day and release it during the night, which is beneficial for preserving temperature conditions in a building. Nevertheless, according to a new study published in Nature Communications, **Red bricks** can store energy and act like batteries.

In particular, chemistry researchers from Washington University in St. Louis have created a technique that makes bricks capable of storing power and using it to power devices. The bricks can be connected to solar panels and store renewable energy.

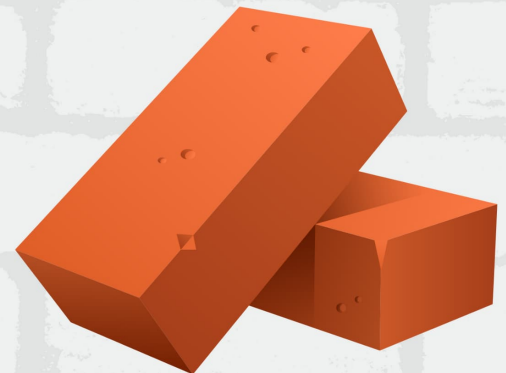
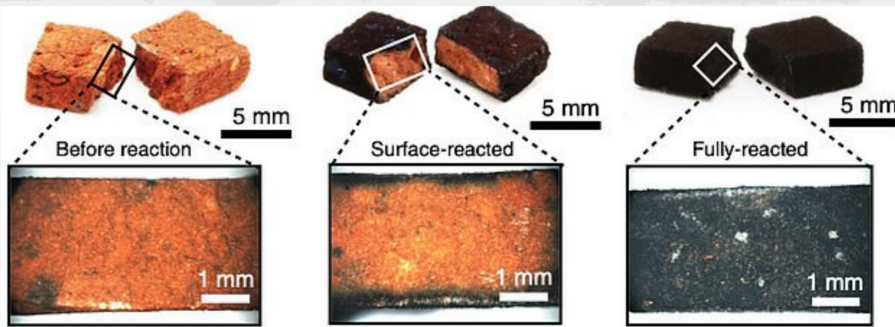
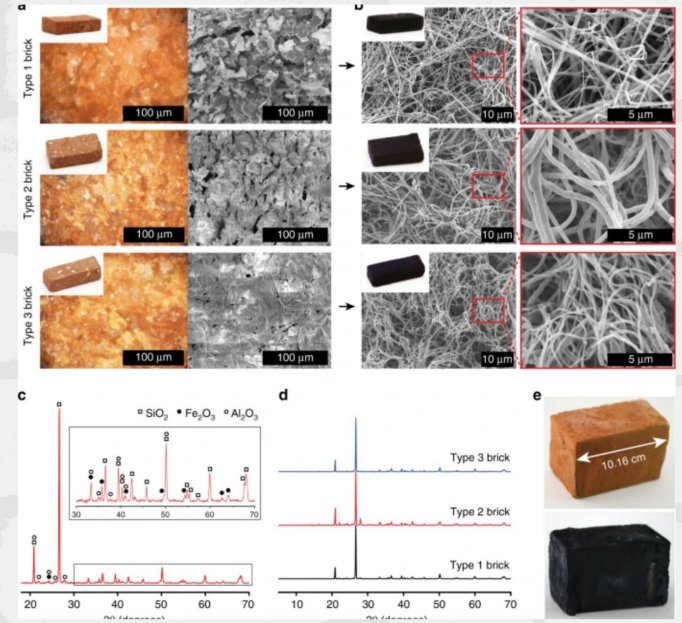
How do bricks store energy?

Bricks have a porous structure that enables the storing process. Those pores are filled with an acid vapor that acts as dissolved iron oxide (or rust) from which bricks are composed. Gas is transferred through the cavities of bricks filled with a sulfur-based material that reacts with iron. As a result, a conductive plastic, polymer **PEDOT**, surrounds the bricks' porous. In this work, a coating of the conducting polymer **PEDOT** comprises nanofibers that penetrate the inner porous network of brick. A polymer coating remains trapped in a brick and serves as an ion sponge that stores and conducts electricity.



According to the scientific team, the proposed technology can create a significant amount of renewable energy. Researchers calculated that it would take 13 minutes to charge 50 capacitor bricks, which would provide enough power to operate emergency lighting for at least 50 minutes. Sounds interesting, right? Among the other advantages, brick capacitors can be recharged multiple times within short periods without any deficiencies. Researchers emphasize that iron oxide, a waste material, has been turned into a valuable product that generates renewable energy. Supercapacitor technology adds value to "dirt-cheap" construction material.

It demonstrates a scalable process affording energy storage for powering embedded microdevices in architectural applications that utilize fired brick. So, in the future, it is feasible that when one says that they plugged a device into the wall, they will mean it literally.





"IF YOU CAN'T FIX IT, YOU DON'T OWN IT"

RIGHT TO REPAIR

The Right to Repair is to get companies to make spare parts, tools and information on how to repair devices available to customers and repair shops to increase the lifespan of products and to keep them from ending up in landfills.

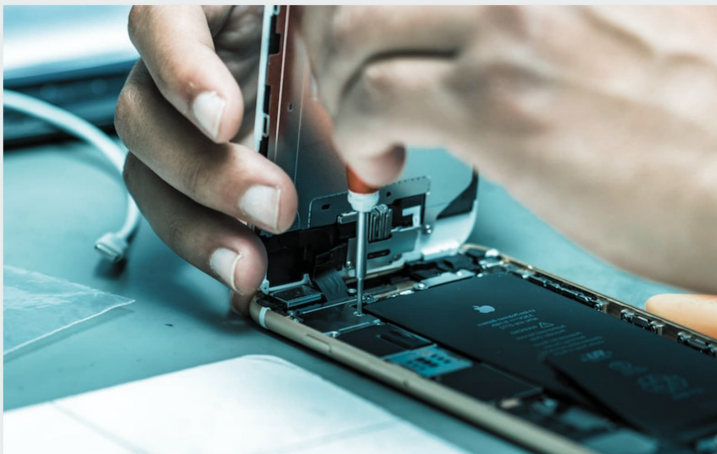
CHAPTER

04

We MUST HAVE ACCESS to products that can be repaired by technology-savvy consumers and repair shops.

As security and information technology professionals, we recognize that the freedom to repair, fix and tinker is core to the advancement of the technology industry. We also recognize that it is indispensable if we are to not only realize new products and services, but also keep them secure from hackers, cyber criminals and other unwanted adversaries.

Once you've paid money for a product, the manufacturer shouldn't be able to dictate how you use it—it's yours. Ownership means you should be able to open, upgrade, or



Ever wondered why it is so hard and expensive to replace your phone's battery or increase its storage or replace its screen? The same can be said for laptops, where the storage, RAM, and battery are either soldered or glued to the chassis in the name of lightness and portability. Thus, planned obsolescence is employed by companies like Apple, Samsung, Dell, and HP to force customers to buy new hardware whenever there is some issue with our electronics, to maximize their profits. Due to these practices, the amount of e-waste being developed has increased significantly.

The notion of the right to repair for electronics relates to the concept of allowing end-users, consumers, and businesses to repair electronic devices they own or serve without any legal or technical constraints. This concept aims to make electronics easier and less expensive to repair to extend the lives of such devices and reduce electronic waste created by broken or underutilized equipment.

While initially driven primarily by consumer protection organizations and the automotive after-sales service business, the concept of adopting a right to repair not only for vehicles but for any type of technological goods gained traction. This was due to the widespread availability of consumer electronics such as smartphones and computers, which resulted in damaged and old electronics becoming the fastest growing waste stream.

Today, it is estimated that more than half of the Western world's population owns one or more worn or broken electronic equipment that is not returned to the market due to a lack of inexpensive repair. The right to repair movement attempts to solve these issues by proposing legislation requiring manufacturers to provide access to spare parts and repair tools at fair market pricing and design devices that allow for easy repair to promote repair over replacement.

According to the restart project, increasing the lifespan of a Smartphone by 33% (i.e., replacing it after four years instead of three) may reduce annual carbon emissions equal to the entire country of Ireland's annual emissions.



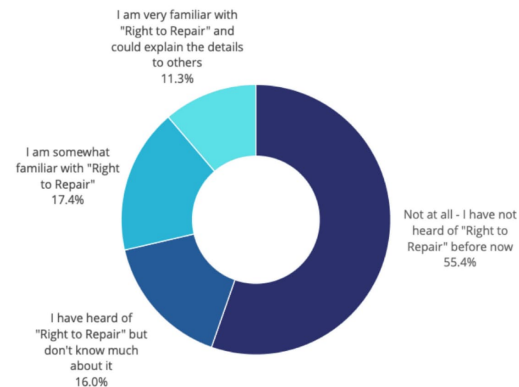
The good thing is that measures have been taken in the right direction to facilitate repairs for most electronics in the European Union (EU). As of March 1, larger electronics like televisions and monitors sold in the EU have to be repairable for at least ten years, which means manufacturers must guarantee the production of spare parts. Moreover, some companies specifically market their products for great repairability by providing spare parts and repair manuals to third-party repair shops. For example, Framework sells laptops with completely modular ports, replaceable SSD, RAM, battery, keyboard, and even the motherboard and readily available repair guides. Even the general consumer would be able to repair it. Another example is Fairphone, which provides smartphones that can be easily repaired by simply a screwdriver and provides spare parts for even cameras and five years of warranty.

Thus, as consumers, to promote repairability, we should pressure our lawmakers to force all possible companies to release repair guides for their products and make them more repairable instead of sealed products. Sealed products require a specific skill set to be able to repair.

Local repair and resale businesses would not exist without repair being made possible. Hence, it is a viable solution for avoiding being ripped off and correcting the e-waste problem of our planet.

Familiarity with Right to Repair

"How familiar are you with the concept of "Right to Repair" when it comes to electronic devices, appliances, or machinery?"

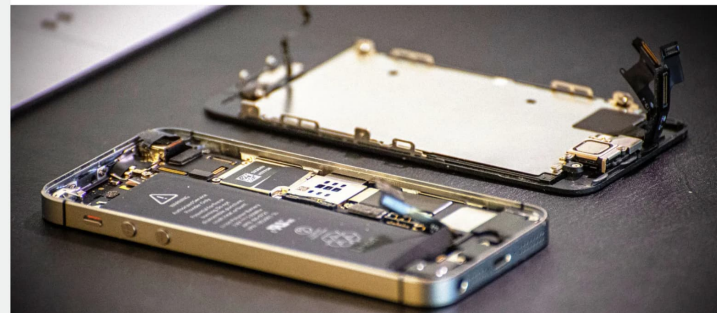


28.7%

of respondents are **at least somewhat familiar** with Right to Repair.

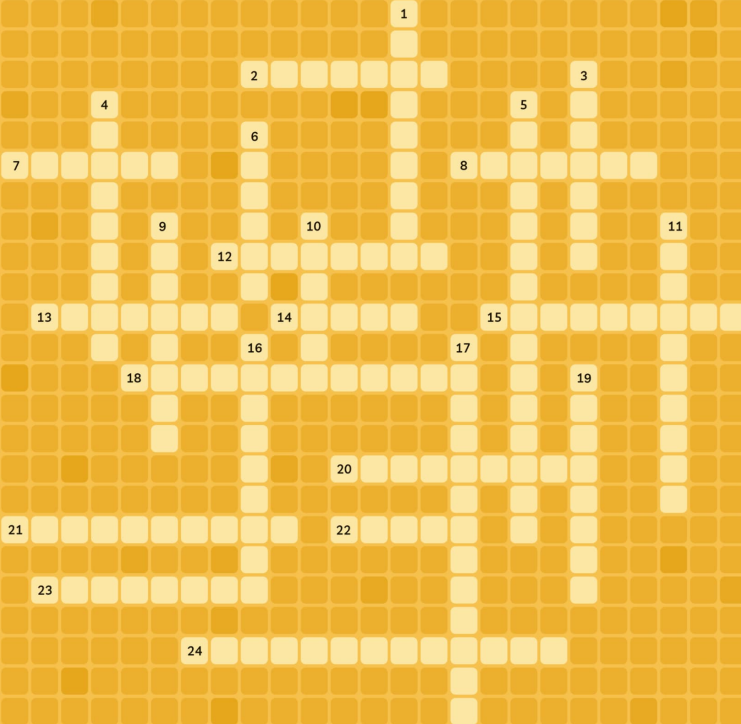
55.4%

of respondents **haven't heard of** Right to Repair.



Creative Corner

Solve the Crossword using following hints



Across

2. Software program developed to harm other computers
7. The set of rules that defines the combinations of symbols that are considered to be a correctly structured document or fragment in that language
8. It refers to the part of an application that performs an essential task not apparent to the user
12. The first page which appears on opening a web browser
13. A software program that allows you to surf the web
14. Unit of cryptocurrency
15. A graphical representation of a computer program in relation to its sequence of functions
18. This empowers IoT by bringing together everyday objects
20. Any word, phrase, or picture that, when clicked, take the user to another location
21. Encoded series of transactions used in cryptocurrency
22. It is temporarily stored on your computer
23. A type of scam where an intruder attempts to gain unauthorized access to user's information by pretending to be the user
24. Google, Yahoo and Bing are popular examples of

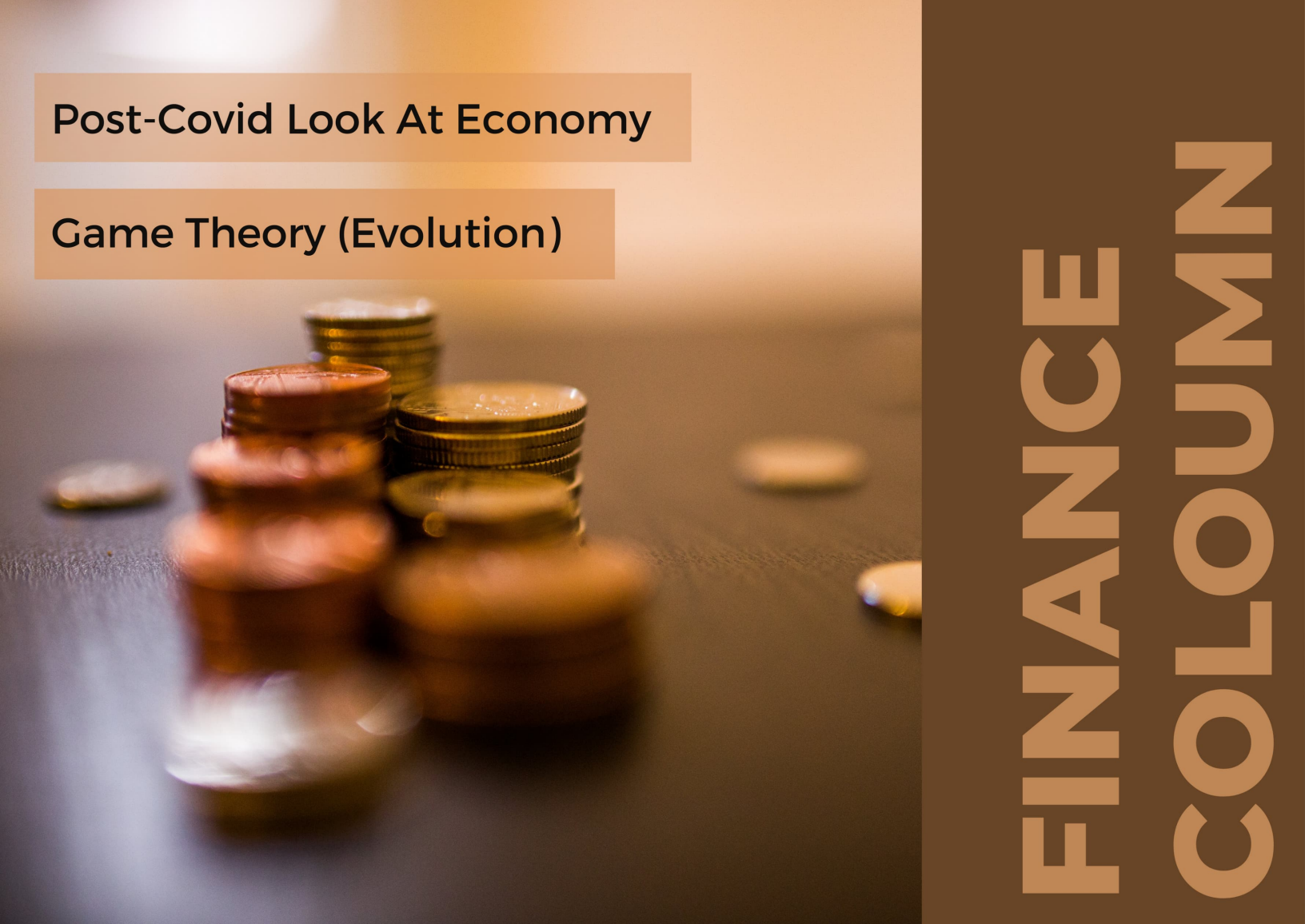
Down

1. Playing video and sound in real time
3. A point within a network that interconnects with other networks
4. Part of a file name that usually reflects the file format
5. The form of AI that make predictions from data
6. An easy-to-learn programming language
9. First line of defense
10. The term to load and initialize the operating system on a computer
11. The practice of examining large amounts of data in user databases and websites to find consumer patterns, behaviors, and relationships that can be useful in marketing goods and services online
16. Finding and fixing bugs in programming
17. Refers to measures designed to protect your computer
19. A saved link to a particular Web page

Post-Covid Look At Economy

Game Theory (Evolution)

FINANCE
COLUMN



POST-COVID LOOK AT ECONOMY



CHAPTER

05



For significant swathes of the Indian economy, the economic shock that followed the coronavirus outbreak has been nothing short of devastating. As the informal sector that had helped prop up the economy, came to a crashing halt as soon as the lockdowns were implemented. This highlighted the fragile nature of the economy's weak growth in the years leading up to the epidemic. Nonetheless, the road ahead does not appear to be as perilous as it did only a few months ago

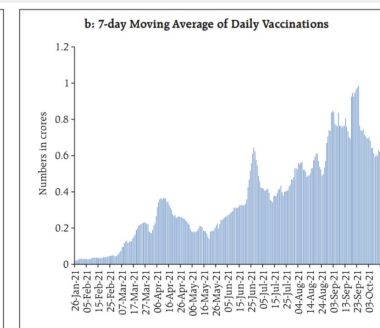
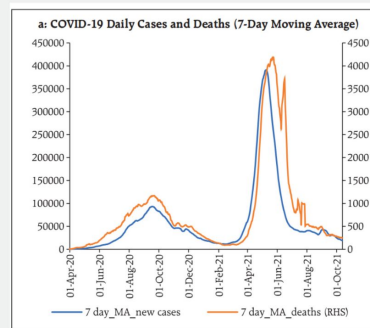
CMIE's Consumer Pyramids Household Survey shows an all-around improvement in September 2021. The unemployment rate has fallen from 8.3 % in August to an encouraging 6.9 % in September, resulting in job growth of about 8.5 million.

Quoting CMIE's Survey: "Employment in September 2021 is estimated at 406.2 million. This is the highest in 20 months or since the Covid-19 shock in March 2020."

This increase in employment was observed in urban areas, but rural areas also saw healthy growth. The most favorable part is that salaried jobs saw considerable growth among major occupation groups.

Covid Cases and Vaccines

As of November 25th, the country's active caseload had dropped to 1,11,481, the lowest level in 288 days, resulting in increased mobility and consumption as mobility restrictions had been relaxed throughout most of the country. Vaccinations have continued to be successful, with India surpassing the 1 billion dose mark on October 21st, with over 75 percent of the eligible adult population receiving the first dose and roughly 31% receiving both doses of either Covishield or Covaxin vaccines. This high vaccination percentage will ensure the return of domestic demand and economic activity

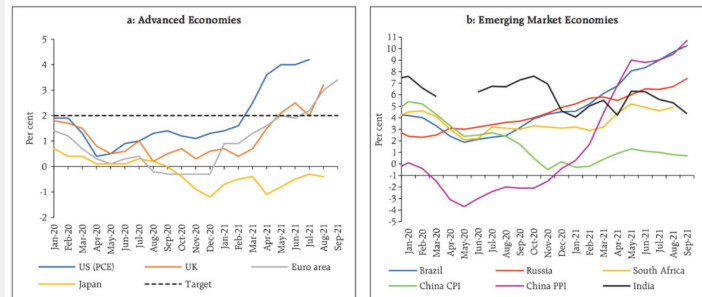


Source: Ministry of Health and Family Welfare (MoH&FW).

Inflation

According to the RBI's monthly bulletin, the Consumer Price Index (CPI) inflation declined by one percentage point to 4.3 percent. This was aided by a 1.1 percentage point month-on-month base effect when compared to prices a year ago. This lower inflation is now much closer to RBI's targeted 4%, thus giving RBI more leeway for performing more demand-side measures and stimulating the engine of growth.

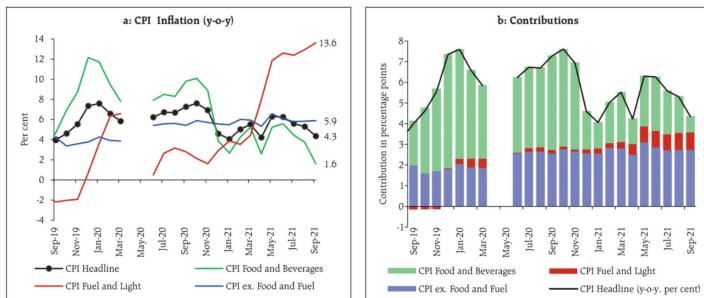
Interestingly, food and beverage consumers have seen a deflation recently as the opening up of the farming sector has allowed for better transport facilities and easier access to farming goods for the growers. While fuel inflation has been relatively high, this has not deterred the Indian economy from getting back to pre covid levels in consumption. Petrol sales have gone up 3.93% YoY and diesel 1.27% YoY.



Source: Bloomberg

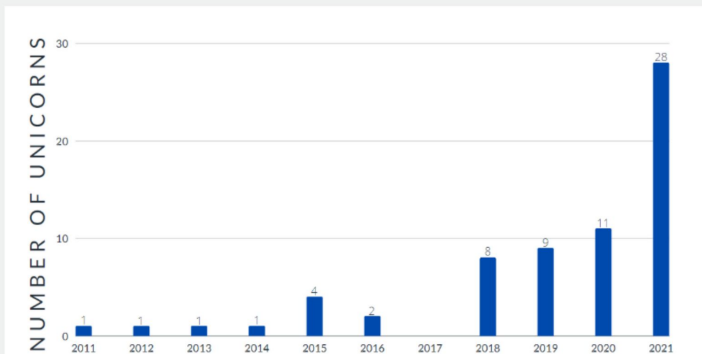
Domestic Markets and Unicorns

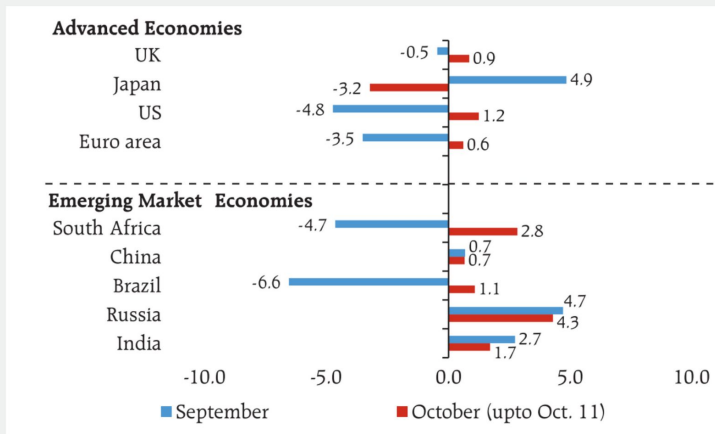
Even though the pandemic has a negative economic impact, the markets have not been happier. This might indicate a decoupling of the economy and financial markets, or more likely, the markets are working off the economy's growth potential as it appears today. As is often observed, markets are based on estimates for tomorrow rather than present conditions, but this has resulted in a massive influx of foreign direct investment (fdi), as evidenced by the number of unicorns India has seen recently, which stands at 28 at last count.



Note: CPI inflation for April-May 2021 were computed based on imputed CPI indices for April-May 2020.
Sources: National Statistical Office (NSO); and RBI staff estimates.

Number of Unicorns
created over the years





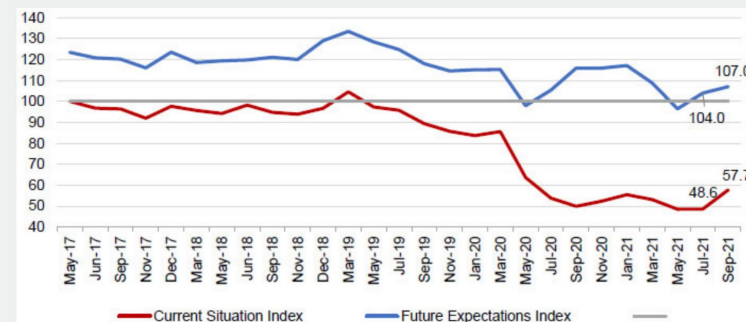
Formalization

According to SBI's Ecowrap research, India's formal sector had grown from roughly 48 percent of GDP in 2017-18 to 80-85 percent in 2020-21. One might ponder how this data was collected and how this will affect our economy in real terms growing forward. However, first of all, the data has been collated using financial transactions, tax net presence, and employment data from EPFO payroll and e-Shram portal data. The starkest effect of this will be better and higher quality data for the government to base its policies and schemes on, thus providing a better social security net for the newly formalized sector.

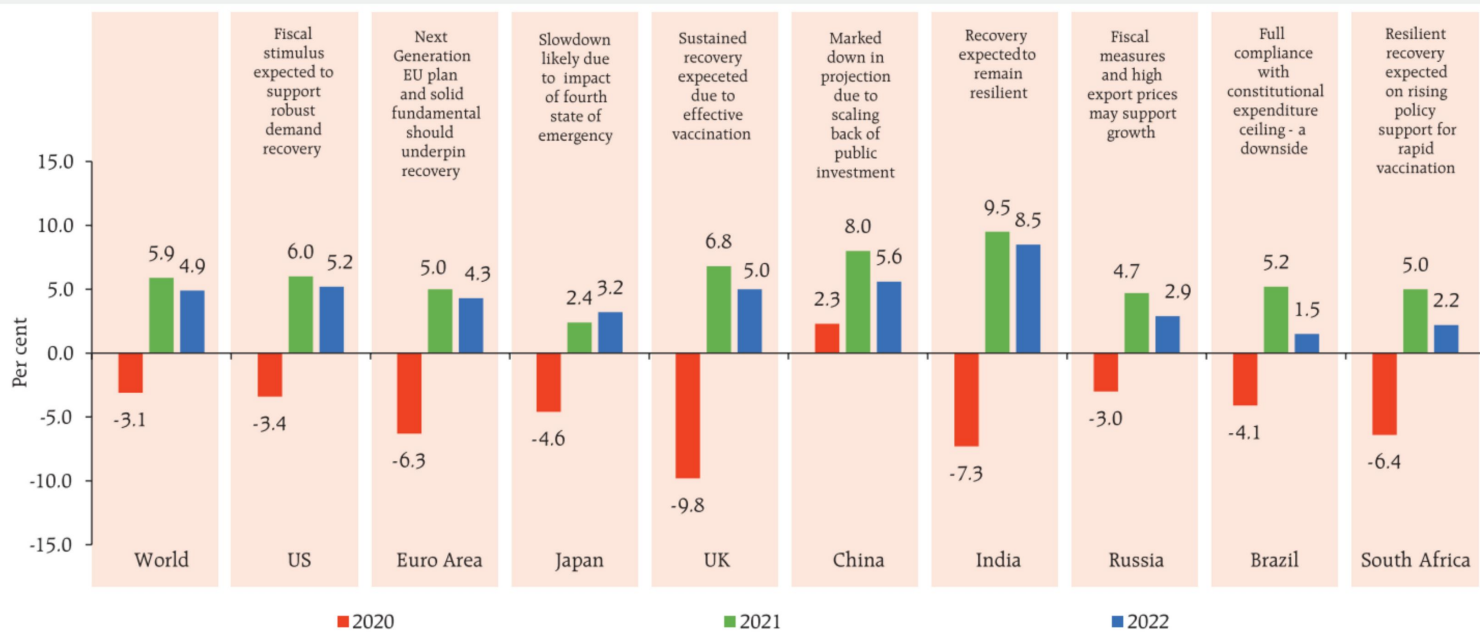
A populace that had been largely excluded from the benefits received by the formal sector earlier also gave India better transparency in our economics. Increased formalization has usually resulted in higher-paying capital-intensive jobs in the long run, which India currently lacks.

Overall, consumer confidence is increasing. The economy's constraints appear to be more on the supply side than the demand side, which is a consequence of global supply limitations and should not worry the Indian economy. The estimates have been acceptable, although from a lower base. However, a lot of high-frequency data appears to be painting a brighter picture of tomorrow. Though India has a history of disappointing in this area. The Indian economy would be able to sustainably meet the expected growth rates if the government can control its fiscals as well as it has been doing while transforming vast sections of the sector.

The last time the Indian economy had hit such numbers, it turned out to be an overheating of the economy. Shoddy regulation led to the lousy banking sector. We have seen this for the past few years; this time around, we have to be more careful with this massive growth potential. If we realize this, it has to be on the back of reform and better regulation.



Consumer confidence indices



Source: IMF.

Projected GDP growth figures for major economies

GAME THEORY



hmm..interesting move

what is he thinking

I am going to win

CHAPTER

06

Game theory is a collection of tools for analyzing states where there is an interconnection of the actions of individuals. Any strategic interaction in which your performance depends on other's activities as well as your own choice.

Rationality is one of the essential concepts of Game Theory; it refers to the player's understanding of the game and exercising the ability to reason. But common knowledge is required in Game Theory, i.e., an infinite loop of knowing that the other players are rational. This mutual rationality catalyzes what we call iterative reasoning. The result of every round starts for the next.

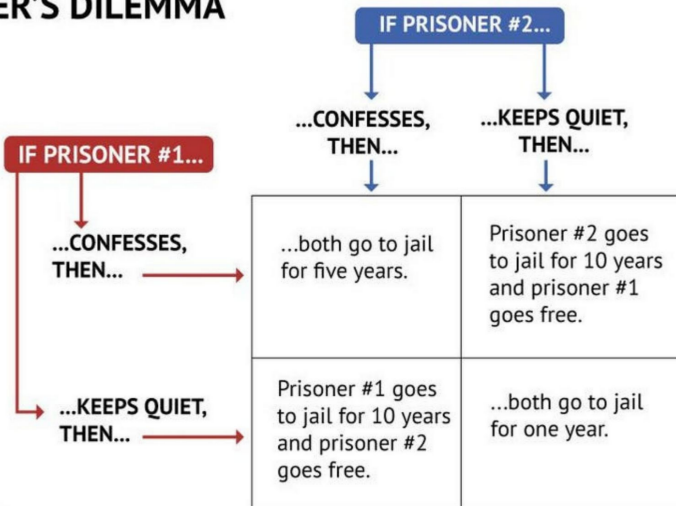
Simultaneous move games are when the players are unaware of each other's actions simultaneously (or decisions).

The majority of real-life scenarios are similar to this. A payout matrix (Strategic form) is a table that contains all potential game outcomes and provides the payoffs for each participant in those scenarios.

NASH EQUILIBRIUM

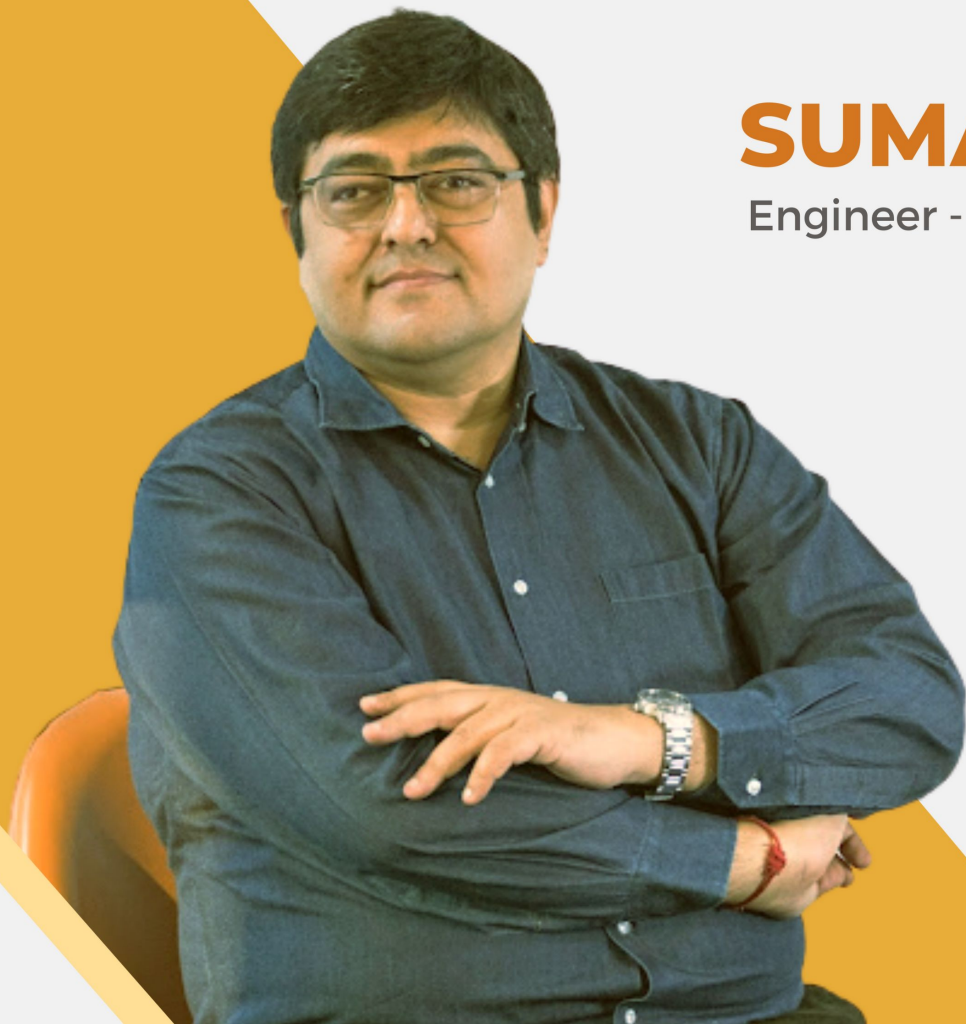
Nash Equilibrium is a game theory concept that determines the optimal solution in a non-cooperative game. Each player lacks any incentive to change their initial strategy. Under the Nash equilibrium, a player does not gain anything from deviating from their initially chosen method, assuming the other players also keep their approach unchanged. A game may include multiple Nash equilibria or none of them.

THE PRISONER'S DILEMMA



It conceptualizes the behavior and interactions between game participants to determine the best outcomes.

It also allows predicting the players' decisions if they are making simultaneous decisions, and the determination of one player takes into account the findings of other players.



INTERVIEW WITH

SUMAN SARAF

Engineer - CTO - Founder

BlueStacks

Founder and CTO

now.gg

CTO

Blue Whale Tech

Co-founder and Director



First things first, how did COVID-19 impact your life? The challenges you faced and the learnings you gained from the pandemic.

I lost my mother in the first wave. She was admitted to the hospital for another complication and contracted Covid in the ICU. The second wave was brutal, and I think almost everyone was affected. I have lost some friends and young ex-colleagues. Quite a few people in the office were affected too. On the flip side, working from home allowed me to spend time with family. My daughter will start college next year, so looking back, the last 20 months allowed me to spend a lot of time with her. On the work front, the business grew, and we also more than doubled our strength. I am surprised at how well we could all work remotely. As a company, we took several measures to ensure a healthy balance for all of our employees. The pandemic overall has transformed my thinking on family, work, and enjoying each day as it comes.

A future into this side of tech is still not so common. How did your peer react to your decision and development over the years?

Staying on the technical side and not moving to management was uncommon back in the day. When we graduated, India's typical progression was writing code for a few years and then moving into management. While that was the norm at most companies, Hughes, where I spent my initial years, was an exception. We had very senior engineers who were purely on the technical track. When I was working on projects abroad, it was common to find engineers who had purely been writing code for 20-25 years. I was clear in my head that I always had to be a hands-on engineer and most of my closest peers are like that.

As of February 2021, BlueStacks have been downloaded over 1 billion times and has more than 500 million users. Being the founder of million user project, can you share your journey

When we started in 2011, we were just 10 of us huddled in a room. We knew it was a good problem to solve, but to be honest, I never imagined it would see such broad adoption. On the day we released our Alpha version, we entered our predictions in a shared spreadsheet. In a couple of hours, even the most ambitious prediction had been surpassed. That was the first time it occurred, what have we unleashed on the world! The people haven't stopped coming ever since. We have users in over 100 countries and even on the Antarctic station. Every other day, we receive messages from users who are using our products in very creative ways. Often, when I am wearing a BlueStacks shirt or jacket, random people stop me and want to chat. My kids were initially surprised that all their friends at school were using it.

What, according to you, made BlueStacks make a mark in the market?

It solves a real problem for them, and it keeps improving. As a company, we always listen to our users feedback and innovate on their behalf. The market has changed, the demands have become more complex, and we have ensured that the product has kept up with everything. That's what keeps our users happy and us relevant.



You have been working in software development for quite a long time. How has the industry changed from the 90s to now?

It has evolved greatly in various dimensions. There are higher-level abstractions available for almost everything. The development and debugging tools have also evolved greatly. With free credits, pay as you go cloud, and other API providers, you can focus on solving the real problem without having to build a lot of infrastructures.

This allows for rapid prototyping and testing for market fit. In the olden days, it could take months to a couple of years to get an Alpha version out; now you can build out POC's in the order of weeks. Learning new skills has also become so much easier. There are so many free or inexpensive courses that are very high quality and so much shared expertise that can be relied upon. We joke in our office that when we started in this industry, 90-95% or more of the code backing any product or service had to be written by us. Now, companies probably have 5-10% of the original contribution in any product. Most of it is built by leveraging already available frameworks. The costs of starting a company have also come down drastically. You don't really need to invest upfront in servers and expensive software licenses on day 0. A few developers with laptops, internet connection, and a credit card, and you are ready to go.

What, according to you, are the most important managerial skills? The skills that help translate your ideas and vision to the teams?

I haven't directly managed large teams, but having watched some exceptional people do it, I have noticed the following qualities. They are extremely capable by themselves, can articulate very clearly why something needs to be done, and then leave the team to figure out the specifics. When the going gets tough, you will find them in the trenches with their teams. They care deeply about people and stand up for them. At the same time, they are very decisive and don't hesitate when it is time to have uncomfortable conversations. The best managers I have seen often inspire their teams to accomplish what they previously thought was impossible.

Throughout your professional career, you have had a fair share of both working for companies and working as an entrepreneur, which one did you enjoy more and why? How different were the challenges that you faced in both of the roles?

To be honest, I enjoyed both. Hughes provided me with a rich work experience. It was an opportunity to work with some of the smartest people on some of the most technically challenging projects of those times. I was young when I was at Hughes, so my focus was mostly on technology, not so much on the business aspects. As an entrepreneur, you are dealing with many dimensions - people, technology, product, customers, business, funding, etc, so there is a lot of learning every day. You also wield a much larger influence on the course of a company, and while it's very exciting, it comes with greater responsibility. I just want to be clear that you can do great and gratifying work in both places. You can be an entrepreneur even inside of a large company. What matters is when you go home, you should feel proud of what you accomplished during the day.

Mobile Cloud Computing is the future ahead. Can you share what do you feel about the future of the field ? How Now.gg, that you are a CTO of is working towards transforming the future of gaming?

We strongly believe that Mobile Cloud will revolutionize the world of gaming. The majority of the phones are severely inadequate, and the others are rapidly deprecated to be able to keep up with the growing CPU, GPU, and memory demands of mobile games. We were focused on this space for many years, but the hardware offerings in the cloud and the connectivity weren't right until 18-24 months ago.

We are now at a position where various pieces of this ecosystem are lining up correctly. I anticipate millions of users will be streaming intensive games directly from the cloud in the near future.

"Sometimes the best things in life come unexpectedly". What is your mantra for dealing with unprecedented situations?

As you grow old, you realize how little you control. You plan for everything, but life has a way of throwing unexpected surprises all the time. So my mantra is to take things as they come. That keeps life exciting. Looking backward, you realize how some of the best things to happen to you were purely by chance. I like to give this example from college - when I was there 1993-1997, we got an internet connection via EARNET. Just because I had shown some interest for Linux, Prof. Dhiren Patel let me have access to the Central Computer Center. For almost 18 months, I was the sole user of that connection, helped build the computer center, and in the process, ended up learning a lot. That experience gave me a head start in my career. If I had joined the college a year earlier, I wouldn't have got so much time, if I had joined a year later, the infrastructure would already have been in place, and I wouldn't have learned so much. It was sheer good luck and great timing. A lot of business deals and other opportunities have also arisen from some chance interaction in the past.

Does your present venture Now.gg see themselves hosting gaming competitions on their platform in the near future?

Definitely, we know from past experience that competitions create a lot of buzz and attract a lot of new and returning gamers.



Being in a field that requires constant upgrades, how do you keep yourself updated with the latest tech?

I read a lot, try to be hands-on, and hang out with smart people, especially the younger folks in the office. It is imperative for us to learn all the time, especially in our field.

You are a success story and a figure to look up to for our college. What are the skills and qualities that make such a personality as yours?

It is overwhelming to think of myself as a success story and a role model. I hope I can be that someday. I was a small-town boy who loved computers and just happened to find my place at NIT, Surat. The professors were very kind, helpful, and always very encouraging. As I said, the Computer Center experience gave me a huge head start. So looking back, I can say that you have to make the most of what is available, read and learn voraciously,

Learn through hands-on experience, be humble, and cultivate the desire to succeed. You should also always benchmark yourself against the best in the world! One last thing; a wise man once told me: you should either be able to build things or you should be able to sell things. Everything other skill is dispensable.

In the end, what advice or message would you like to give to the budding entrepreneurs out there?

Focus on a problem that is worth solving, which you are passionate about, and something which can give years to. You also need a team of people who are equally driven and have complementary skills. Work hard and have fun. It is also essential to enjoy this process as most days are full of extreme emotions, uncertainty, and little sleep. That's what makes it so exciting!

_____ ✕ _____

Age of Anime & Animated Series

Social Media For
Social Good or Evil
An Introduction

OTT Platform



READER'S
CHOICE



**AGE OF ANIME &
ANIMATED SERIES**

CHAPTER

07



"Sarada's eyes burned like the Sun, fervent with loss, love, and friendship. Sasuke's cloak whispered a solemn lullaby assuring warmth, comfort, and a forehead flick to her right. Mitsuki stood tall, his yellow eyes grave and sly, assessing the enemy in front of them. Team 7 stood alone, steadfast and peerless unfazed by the horde of Otsutsukis in front of them."

If you don't remember this scene in Boruto, don't worry because it isn't there. Just like millions of anime fans who binged through 200+ episodes, 63 chapters, 5 light novels, 4 Shidens, and 3 Restudens just for a hint of the time skip arc, I, too, imagined what; the endgame would be like?

It seems extraordinary that a 55-second animation compelled viewers to endure over 140 filler episodes containing no plot, direction, or character development whatsoever. However, the opening scene of episode 1 of Boruto epitomizes that, making the time skip in Boruto one of the most anticipated arcs in the anime community.

The anime patronage is estimated to have a market scope of about \$25 Billion in 2021. Ever since big players like Sony and Netflix have entered the market, the industry is forecasted to grow exponentially, doubling its value by 2022.

Lockdown removed most of the stigma surrounding anime. Bored and without face-to-face interaction, people hesitantly explored the 2D isekai that lay beyond their screen, finding themselves crying to Koe No Katachi or weaving the signs for Chidori like so many other children and adults had done before them.

What do anime creators want to convey? The answer varies according to whom you ask. In my humble opinion, creators, animators, illustrators, designers, and everyone involved in creating an anime want us not just to see an animation but to observe it. They want us to question each frame, drawing, panel, and character and try and justify why it was done or displayed the way it was. As long as people continue to do so, the anime industry and community will only continue to grow.





SOCIAL MEDIA FOR
SOCIAL 'GOOD' OR 'EVIL'
AN INTRODUCTION

CHAPTER

08



Let's admit it, we are attracted to our phones now and then, and as soon as we leave the world of social media, it does not feel good.

It might be because we've spent time doing nothing productive, but mostly because we see so many people happy and satisfied with their lives, we start comparing our lives with others.

As humans, we constantly crave social approval. This obsession with what others are going to think isn't doing much good for society. The cases of depression and anxiety have risen among teens. Though an increase in internet usage comes with benefits, it also comes with its drawbacks. Increased social media usage has led to:

Echo Chambers

One way to earn revenue from ads by internet companies is retaining the viewers for as long as possible. They want to prevent people from leaving their platform for as long as possible. A way to ensure this is by showing the viewers what they like and surrounding them with like-minded people.

Think of it this way. You watched a video on a show you particularly like, for example, "The Office." You like the video, and the moment you refresh the tab, your feed is filled with different clips from the show. You then go through hundreds of video clips related to that show. Slowly and steadily, you surround yourself with the kind of people who believe that Office is the only best show and none of the other sitcoms are parallel to it. You don't want to consider anybody's point of view other than the people who agree with you.

This whole situation described above is called an **Echo Chamber**, where people only encounter others who reinforce their own opinion about something. It doesn't matter if the given viewpoint is wrong. What if there is a particular community of people who believe in superstitions or some sort of pseudoscience? This can be detrimental to society. Many people have started to believe in things that have nothing to do with facts or science, and they don't want to listen to anyone who disagrees with them.

Chaos

As discussed earlier, people are unwilling to listen to any argument against their opinion nowadays because the internet has made them so biased and intolerant. In such cases, neither of the sides can win, and everyone will keep on believing what they once did without fail.

These contradictions lead to more and more chaos on the internet. People are trolling each other, tweeting about how wrong different viewpoint is and why the people who follow that viewpoint are stupid! The cancel culture on Twitter is where people criticize each other, including the "successful" people, over their perspectives.

Also, various easy-to-use online tools enabling **deepfakes** make it effortless to create fake content. With this advanced software, anyone can make public figures say anything, things they never said. With advanced editing tools, we can make people appear in events they never attended. The line between real and fake is becoming blurred, leading to more chaos on the internet!

Surveillance

The primary concern to be raised in these times of digitalization is surveillance by the authorities which undermines the right to privacy. Due to increased digitalization, the government often tries to look into people's devices to check whether someone is a threat to the state or not.

Some Governments worldwide have also started using **Facial Recognition System (FRS)** to spy on their citizens, and its laws are second to none. While the argument given by the government looks pretty noble that using FRS, they want to identify the criminals in society and apprehend them. China comes first in the list of illegal uses of FRS on citizens, and there are no laws or regulations regarding the use of FRS in the country. The use of the tech has grown to such an extent that almost every country's citizen is registered into it.

Though many European countries have come up with laws to tackle the problem of surveillance by enacting laws around it and tightening rules around FRS, it is yet to come by and be followed sincerely in India and many other countries around the world.



OTT PLATFORMS



CHAPTER

09



We are just a click away from exploring various horizons with the world at our fingertips, thanks to the internet !

Shedding some light on Over The Top (OTT) platforms, it is a live video streaming service offered directly to users via the internet. Unlike WhatsApp (which provides free SMS), users have to pay additional charges for surfing media other than their internet pack. There are currently about 40 OTT providers in India, the first being BIGFlix launched by Reliance Entertainment in 2008. Some major ones are Netflix, Disney+ Hotstar, Amazon prime, Eros now, Sonyliv, Zee5, etc.

How does OTT work?

When thousands of people are watching the same page simultaneously, it's the website speed that matters. Here Content Delivery Network (CDN) comes into play. It not only speeds up the website loading time but also protects main servers from local servers.

Pros and cons of OTT

We can enjoy our favorite movies and series from the comfort of our homes. Plus, it is cost-effective for binge-watchers as they don't have to pay separate money for each film they watch. Moreover, we are given multi-platform facilities, i.e., we can go for phones, laptops, desktops, tablets, and other handheld devices whenever and wherever we like.

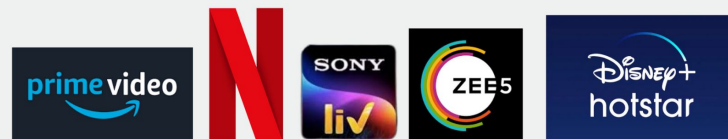
Every coin has two faces, so coming to disadvantages, we have the disturbance due to network glitches that hinder our enjoyment. Things like this are an addiction for youths, and they waste their valuable time on OTT rather than being socially active, which ultimately results in anxiety and stress in their lives.

Future of OTT

Today the OTT industry is booming at a swift pace. The revenue generated by over-the-top (OTT) media is expected to reach 158.84 billion dollars by 2024. This is more than twice generated in 2018. In general, OTT has grown massively over the eight years, with revenues growing exponentially from 6.1 billion U.S. dollars in 2010 to over ten times that amount in 2018.

Conclusion

Due to the outbreak of COVID-19, OTT is among the few but much-needed sources of entertainment these days. As long as we are spending limited hours, it is a legit and economical platform. Who knows? Traditional TV may even become distinct in the coming years.





COSMOLOGY CORNER

A long-exposure photograph of a night sky showing star trails over a mountain range. The stars appear as long, curved lines of light against a dark blue background. The mountains in the foreground are dark and silhouetted, with some snow visible on the peaks. The overall scene is serene and majestic.

**SPACE
EXPLORATION**

CHAPTER

10

There was a time when everyone, including politicians and prominent personalities, argued that we should be spending money on space exploration instead of trying to save the earth and its people. And while that question still pertains, we have come a long way in this avenue. We are not just spending money on space exploration now but also space tourism. Yes, you read that right. I am sure you have all heard about the space trip that Jeff Bezos went on recently. If not, let me tell you what our very own Jefferey has been up to. He blasted into space on 21st July on his own company's (Blue origin) first manned flight, along with three other civilians aged 17 to 82.

While it is claimed that all this is in the pursuit of setting up roots outside of earth and, therefore, the betterment of humanity, it isn't apparent how. Right now, it just looks like a hobby to amuse the rich.

However, one might argue that something like this could be revolutionary as it gives a chance to an ordinary citizen with no formal training to experience something extraordinary. At the end of the day, how much ever one may argue against all this. The curious and visionary part of us, humans, craves to explore and break free.

Space exploration has gained such significance in the last two to three decades that power giants like the USA, Russia, etc. Countries like Israel, UAE, and our very own India are making huge advancements in this field.



This goes on to reflect that space exploration has become a significant thing today, almost a must. It's helpful for all the obvious reasons like sustainable development, but it also helps build its image and reputation. The UAE has launched its first unmanned Mars orbiter 'Hope' in 2020, making them the first to do so in the middle east. The future of space exploration is looking bright.

Let's take a deeper look into one of our national space agencies, ISRO, to understand better. Today India is one of the biggest countries in the world, which is playing an essential role in this exploration. And ISRO is at the heart of it.

Indian Space Research Organization (ISRO) is the National Space Institute of India. The main important work of this institute is to find out Information about space and develop the technology for enhancing the space program. It was established in 1969 on the day of Independence Day.

Dr. Sarabhai is also called the father of the space program. Homi Bhabha, called the father of the Indian nuclear program, formed the Indian National Committee for Space Research (INCOSPAR) in 1962 and Dr. Sarabhai was appointed as the chairman.

Some recent achievements of ISRO have been

- On 22nd July 2019, ISRO launched 'Chandrayaan - 2' comprise a Lander (Vikram) and Rover (Pragyan).
- On 7th September 2019, the ISRO mission 'Chandrayaan - 2' was a big success, and the Lander 'Vikram' made a hard landing on the moon's orbit.

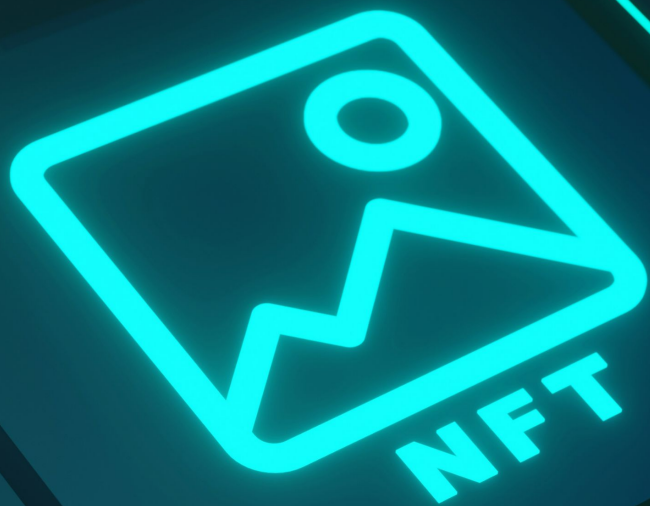


Demystifying
NFTs

IPO Era &
Company Analysis



IN THE
NEWS



DEMYSTIFYING NFTs

CHAPTER

11



In Feb 2021, "Nyan Cat," a cat GIF, was sold for about half a million dollars. Amitabh Bacchan launched an auction of his digital memorabilia, becoming the first Indian to join the massive NFT craze worldwide. NFT or "Non Fungible Token" has been a buzzword that has been on every person's mind and mouth recently. There are tonnes of web pages going around this stuff, but it seldom gives a precise meaning about what NFT is so:

What exactly is an NFT?

It's a non-replaceable asset that is unique. Think of it this way: there's a cloth-producing factory that produces t-shirts, and an influential person like, Elon Musk bought it and decided to sell it. Now, this particular t-shirt holds a unique value. Hence, the specific t-shirt, similar to the t-shirts produced by the factory, can't be duplicated and therefore is "non-fungible." An NFT refers to a digital entity or a digital asset that can be bought or sold digitally using cryptocurrencies. NFTs can be bought and sold using the Ethereum blockchain.

Is it that famous?

People around the world have been going crazy about it. The first tweet by Twitter CEO Jack Dorsey was sold to a Malaysian businessman for \$2.9 million, the jpeg image by American digital artist Beeple was sold for \$69 million, and the "Top Shot" clip by NBA of LeBron James dunk was sold for \$208k. Even big brands like Marvel and DC comics have launched their own NFTs. The global annual spending in NFTs combined to a \$1.05 trillion market in 2020. In India, the actor Salman Khan announced the launch of his NFT collections. The impugned fact here is, why are they paying so much for the ownership when anyone can copy it on their computers? NFT creates digital scarcity, which means the copies of that asset will not have any value because anyone can look into the decentralized ledger, where the owner is verified.



So apart from digital art, are there any other uses for NFT?

- Though people relate NFTs with only digital art, it has other uses as well. NFTs can be a very effective tool to reduce counterfeit merchandise in the market.
- Legal documents can be converted to NFTs, which will help resolve lengthy disputes in court as NFTs can't be replicated, which is often the case with physical documents.
- The tickets bought for any event can be converted to NFTs, which will help prevent fake tickets, reducing revenue loss.

- NFTs can also benefit content creators and artists. As of now, the streaming platforms or the 'middlemen' reap a large cut of profits, whereas creators should be the ones taking the bigger piece of the cake. Artists can convert their songs, videos, or any media piece into NFTs. As a result, they will be the piece's actual owner, and the profits will go straight to them.
- The other fascinating and currently the most active application of NFTs can be found in gaming. The preceding mention of NFT being immutable and trying to help reduce the fake items from the market can help gamers purchase the items in the games. The gaming items can be resold on secondary markets, loaned out, taken off-platform, and even fractionalized. Many games, such as Zed Run, a digital horse racing game, employ NFT to purchase gaming accessories.

NFT And Cryptocurrencies

Today, most of the transactions, from large to small, are done by banks. The bank works as an intermediate between the sender and the receiver. They maintain a database with specific entries of credit and debit of all accounts, which is confidential.

To avoid the intermediate branch, Cryptocurrency was introduced, which uses the blockchain network for maintaining the entries but in a different manner. NFTs are mostly exchanged for cryptocurrencies which also certifies the entity's ownership, as these entries are stored as a digital public ledger.

The Blockchain

In Banks, the transactions are stored in a database. But do you have accessibility to the database? Obviously, No and hence creates a doubt in the mind whether my money is safe or not? Following, we made an attempt to explain blockchain in very layman terms; the actual technology is way more complicated, though.

In 2008, Satoshi Nakamoto used the blockchain to create a cryptocurrency known as the BITCOIN. It is a decentralized distributed ledger, which is publicly accessible ledger. But all the data on the ledger is stored in a 'cryptographic' way, thus maintaining privacy.

As the name suggests, blockchain consists of several blocks, each containing the relevant data of the sender, receiver, amount transacted, etc., hash which is calculated for each block by applying some cryptographic functions on its data, and pre-hash, i.e., the hash of the previous block, thus forming a 'chain of blocks.' Hence, if a hacker tries to change the information of a single block, it won't work, as the hash will also change.

Adding to this, the copy of the whole blockchain is provided to each network user, so if someone tries to change data in a block, it must be changed for the majority of the users, which is almost impossible. Thus blockchain, in short, provides us with a decentralized, secure, immutable, private database whose applications range from DeFi, NFTs, Legal Documentations, and a lot more.



Any reason to be concerned about this whole NFT hype?

Yes. People should be slightly concerned about this hoopla going around NFTs because industry hotshots like the NBA are raising their money by just selling their video, which otherwise is viewed for free. It also has left many people worried about what would happen if the bubble around it dies down as it did in the case of the Dotcom bubble burst of 2000. Also, people are concerned about the legal issues that could arise due to this blind hype around NFTs. For instance, various digital artists have shared their thoughts on social media about their art being turned into NFT and sold on the internet without their permission. Also, the whole world around copyright ownership can become more convoluted. Recently DC Comics warned its freelancers not to sell NFTs of works based on DC characters.

NFTs have a long way to go in acclimatizing themselves with the laws of countries around the world, as the buyer and seller of NFT can be there anywhere around the world, hence creating legal complications in case of conflict.

The alarming rise in people indulging in blockchain transactions has alarmed environmentalists. New blocks need to be mined (their hash needs to be calculated by computers) for recent transactions, which alone requires a lot of energy. A single ethereum transaction takes up almost 70.32 kWh of energy, enough to power an Indian household in the country's poorest states. The solution to tackle this problem is moving to the proof of stake or other innovative technologies for new blocks, which consumes considerably less power than the current proof of work mechanisms on which most of the large blockchains today work. Ethereum has started shifting to proof of stake, Ethereum 2.0, which is supposed to be completed by 2022.

All said and done, the noise going around NFT has been immense and isn't expected to die anytime soon, but the unclear laws around it and the unaddressed environmental problem that could arise due to it are points of concern. Also, there isn't any indication whether this whole thing is just a bubble waiting to burst, and what would happen when it does? Will it have any sort of grave implications on people as it had during the Dotcom bubble burst of 2000? Or will it go on to change and shape the world as internet companies did after the Dotcom incident? No doubt the technology is revolutionary, and keeping a close look at the advancements in the domain will help us answer these questions.

IPO ERA AND COMPANY ANALYSIS



CHAPTER

12



IPO

Initial Public Offering (IPO) is when a privately owned company lists its shares for acquisition by Institutional Investors and Retail Investors. An IPO is typically underwritten by one or more investment banks, which arrange the shares listed on one or more stock exchanges.

Some IPOs also comprise an Offer For Sale (OFS), allowing existing promoters to reduce their shareholding in listed companies. However, the money raised through the OFS route goes to private investors offering their equity for sale.

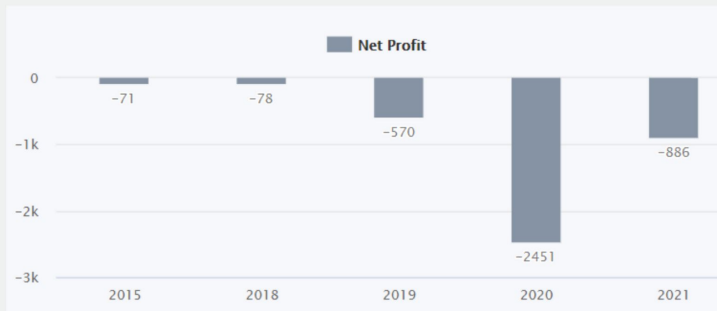
An IPO always fascinates investors with the listing gains. The year 2021 has been remarkable with the number of IPOs poured into the exchange, and it hasn't stopped yet. We're seeing a lot more as we get closer to the conclusion of the year.

With 44 initial public offerings (IPOs) now on the market and more than 80,000 crores in capital raised, this year is already smashing records. Such as the highest number of companies listed since 2007's IPO frenzy, the most increased funds raised through IPO in this millennia, and many more.

Year	Number of IPOs	Amount Raised (in Crs)
2021*	44	₹80,088
2020	15	₹26,628
2019	16	₹12,687
2018	24	₹31,731
2017	38	₹75,279
	* Ongoing year	

Companies are going public to cover losses faced during the covid-19 pandemic or to fund business expansion to feed the increased demands.

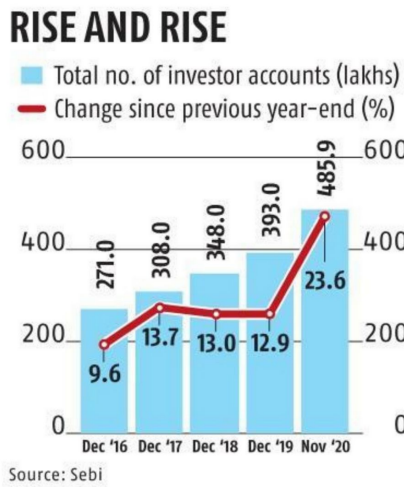
One of the reasons for such a surge in companies pushing for listing is the current bullish market profile. It is observed that investors tend to have a higher risk-taking mentality during a bull run, and all of the Investment Banks (IB) are trying to capitalize on this.



This can be seen from the financials of Zomato, a company operating in a highly competitive sector and has not reported any profit since its inception. But still, it was oversubscribed and listed at a premium of 52.63%.

The exchanges have also reported a sharp rise in new investors. National Stock Exchange (NSE) has witnessed over 90 lakh new investor registration since December 2019.

According to a report, the time between submitting a Draft Red Herring Prospectus (DRHP) and clearance by the Securities and Exchange Board of India (SEBI) is the Shortest in this decade.



Which will mark the start of a company's procedure for releasing an IPO. This adds concern regarding the level of due diligence SEBI is performing before approval.

Name	Issue Price	Listing Price	Listing Gain/(Loss)	Listing Price	Current Price	1 year Gain/(Loss)
Rossari Biotech Ltd.	425	671.5	58%	671.5	1388.75	107%
Gland Pharma Ltd.	1500	1710	14%	1710	3551.15	108%
Likhita Infra	120	130.08	8%	130.08	364.85	180%
CAMS	1230	1517943	23%	1517943	2999.45	98%
Chemcon Specialty	340	731	115%	731	402.55	-45%
Angel Broking	306	275.4	-10%	275.4	1225.25	345%
UTI AMC	554	490.2346	-12%	490.2346	1121.35	129%
Equitas Small Finance Bank	33	31.02	-6%	31.02	63.5	105%
Burger King	60	115.2	92%	115.2	160.65	39%
Mrs. Bectors	288	501.12	74%	501.12	406.65	-19%
Antony Waste cell	315	436.086	38%	436.086	310.95	-29%

When looking at the performance of some of the significant IPOs scheduled for 2020, it is clear that certain companies that perform poorly throughout the listing process are suitable long-term investments, while others that perform very well during the listing process are horrible long-term investments.

Is it the leniency of SEBI? Is it the investment banks that are exploiting the market sentiments and the new investors? We never know. All we can do is perform detailed research and analysis required to invest in good IPOs and prevent future losses



2021 SO FAR

HORIZON TIMES

Indian bagged its best-ever medal tally at the Tokyo Olympics 2020.

India won seven medals across six sporting disciplines, with Neeraj Chopra becoming only the second Indian to win a historic individual gold medal at the Games.



Jassy takes charge of Amazon, while Selipsky takes control of AWS.

In February, Jeff Bezos, Amazon's founder, and CEO said that he would step down from day-to-day operations and be replaced as the company's founder. In March, Amazon announced that Tableau Software's CEO Adam Selipsky would be the new CEO of Amazon Web Services (AWS).



Freshworks completes billion-dollar IPO, officially lists on Nasdaq

The Accel and Sequoia Capital-backed company becomes the first Indian SaaS company and unicorn to list on the US exchange. The shares are trading on the Nasdaq Global Select Market under the symbol "FRSH."

India's Covid-19 vaccine campaign hits a billion doses. On October 21, 2021, India celebrated the distribution of a billion doses of Covid vaccination.

Samudrayaan Mission: Dr. Jitendra Singh, Union Minister of State, launched India's first staffed ocean project, Samudrayaan, at the National Institute of Ocean Technology in Chennai on October 29, 2021. India joined an elite group of countries, including the United States, Russia, France, Japan, and China, specialized in technology and vehicles to perform subsea missions, launching the Unique Ocean Mission.

Facebook changed its company name to Meta on 28th October 2021,

reflecting its growing ambitions beyond social media.

Military Coup in Sudan

On Monday, October 25, Sudan announced a state of emergency after the military dissolved the country's power-sharing government. The former president was ousted in 2019. After this incident, many hoped for a peaceful transition, but now the country is in the midst of crisis.

On November 2, 2021, at the COP26 Summit, Prime Minister Modi and U.K. counterpart Boris Johnson jointly announced the Green Grids Initiative - One Sun One World One Grid.

WHO approves Covaxin. On November 3, 2021, the World Health Organization (WHO) granted Covaxin, India's first indigenously developed COVID-19 vaccine, its long-awaited Emergency Use Listing (EUL).

Twitter's Parag Agrawal, who succeeded founder and chief executive officer Jack Dorsey, is now the youngest CEO in the S&P 500, elbowing Meta Platform Inc's Mark Zuckerberg. Parag became CEO of Twitter in November 2021.

5G Has Entered The Room

5G's blazing-fast speeds and significantly lower latency technology is being put into practice this year in an authentic way as the country's largest carriers build out their 5G networks and extend service into new cities and regions

Top cloud providers in 2021: AWS, Microsoft Azure, and Google Cloud, hybrid, SaaS players Cloud computing in 2021 has become the de facto choice of the IT industry due to digital transformation shifts accelerated by remote work and the COVID-19 pandemic.

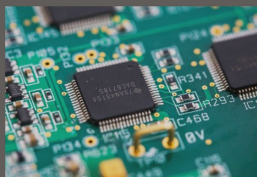
U.S. Withdraws Troops from Afghanistan on August 30, 2021.

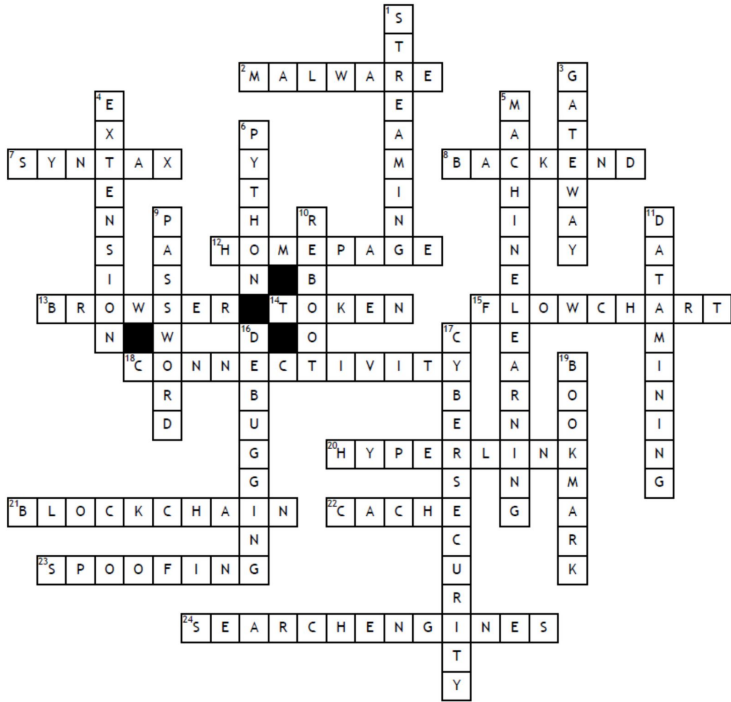
This marked the end of a two-decade conflict that began not long after the terrorist attacks of September 11, 2001.



The global chip shortage wreaked havoc across a variety of industries

A shortage in the supply of semiconductors first hit the automotive industry during the COVID-19 pandemic and has had a cascading effect, causing global disruption. The deficit can be traced back to the first half of 2020 when overall consumer demand for cars declined during the lockdown.





Creative Corner

ANSWERS TO CROSSWORD



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