**Contents**

**The future after the pandemic**

## PROLOGUE

The idea behind this book is to put light on the major events that happened during the pandemic and to highlight their consequences. Apart from that, it will also tell about the transitions that happened in covid and how one should be prepared for post-pandemic. Some technical innovations are also described in this book which will grab your attention so that you could be ready for the technology-driven world.

## The covid19 outbreak

Coronaviruses are a large family of viruses that may cause illness in humans as well as animals. In human beings, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS).
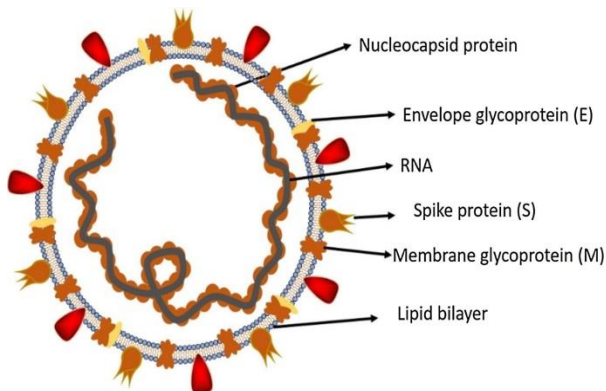


Experts believe that these are the new strain of the viruses that originated from bats or pangolins. The first transmission was founded in the wet market in Wuhan city, Hubei province of china .since then the virus has been spread through person-to-person contact. The University of Calgary shows that it has been evolving slowly since 2013. It has been suggested that the virus has been jumped from an animal into a human.

To be able to survive viruses keep on evolving with their host

organisms. Another one of their initial findings was the similarities between the bat and pangolin coronavirus. The SARS CoV genome has been founded to have at least 96% similarity with bat coronavirus - RaTG13 and about 90% to a pangolin coronavirus (Pangolin-CoV). Earlier it was suggested that the current virus is a combination of both these viruses that got created due to a co-infection in a host.

The rate of infection spreading is so fast, from 1.5 to 3.5 healthy people infected by each patient. The covid19 affected all nations very drastically, the future results will also be more dangerous and scary. Those who are with chronic diseases (e.g. diabetes), immunocompromised people, elderly people who are greater than 60 years, and infants are prone to more risk. However, it affects every age group.

The covid19 collapsed not only health and but also various other fields like education, the job sector, so we must come as a unity and serve the globe at its best with what resources we have as many people have lost their livelihoods and it's difficult for them to feed their families.

# 2

## The world in maps of lockdowns

As covid19 is ramping up, people get infected at a very high rate. To prevent a massive number of infections. Various governments across the globe implemented them in their respective countries to take control on people gatherings and movements in order to prevent them from the massive rate of infection.

The effect of lockdowns on the disease cannot – and should not- be looked at in isolations. In Colombia the days that you're allowed to leave the house depend on the number of your national ID card; in Serbia, a designated dog-walking hour was introduced; and in Belarus the president has gone against medical advice, recommending vodka and saunas as a way to stay safe.

Some of the most common approaches by the government is social distancing and avoid public gathering. All the events, internal movements' public places and sports leagues, and several religious activities have gotten closed.

More than 100 countries instituted either a full or partial lockdown by the end of March 2020, affecting millions of lives. It is not getting from city to city local movements also reduce one of the best things that happened is that earth is healing at a very good rate in lockdowns. The pollution level has been reduced significantly.

New Delhi Yamuna river march 21 2018 and April 20, 2020(source; The New York Times)

There are entwined humanitarian effects like hunger, unemployment, unprecedented migrant worker crisis, and loss of access to widespread healthcare services. As the national picture becomes increasingly complicated, the central government takes supervisory action to monitor the control over the diseases, and these powers are shifted to state governments and then the local authorities.

The countries like Columbia, the days you are allowed to leave a house depend on the number of national ID cards as well as in Serbia the designated dog walking hours were introduced and the Belarus president has gone against medical service recommends vodka and saunas to stay safe.

As of 31 March, residents in cities like Madrid, Paris, London, and New York were making fewer than one-tenth as many journeys using the app as they did normally, according to data from the travel app Citymapper.

In Milan, in northern Italy which has been lockdown for several weeks now, only 3% of trips were planned via the Citymapper mobile app which is compared to before the outbreak.

In Jakarta, Indonesia, where there has also been no official lockdown, congestion has already dropped to almost zero - similar to Los Angeles and New Delhi which shut down on different dates.

Tokyo didn't implement a lockdown, yet but schools have been shut since the beginning of the march. That, and a lack of tourists, could explain why traffic there has been marginally below last year's levels without the sharp downturn obvious elsewhere.

**The migration of the laborers**

Migrant workers are mostly employed in informal, low-skilled, precarious employment in areas such as agriculture, construction, and domestic work and are often subject to many forms of discrimination and engagement. As we know migrant workers earn their daily basis of livelihood. They don't have long-term security and future plans, these circumstances narrowed the livelihood of these migrant workers their lives came to a dangerous end.

Since January 2020, thousands of people have been stranded on their journeys as over 170 countries have put in place some sort of mobility restrictions. Although government come up forward with a solution of special trains called the "shramik special '' trains. But slightly it was too late because they already covered miles barefoot before the engines were started and the administration seems to be heedless in front of the pandemic war.

It has impacted more than 40 million migrants. Around 50000 to 60000 moved from the urban centers to the rural centers. According to a report – 'covid19 crisis through the migration lens'- the magnitude of internal migration is about 2.5x that of international migrations.

As the early phases of the crisis unfolded, many international migrants, especially from the Gulf countries, returned to countries such as India, Pakistan, and Bangladesh – until travel restrictions halted these flows.

The struggle of the laborers has not stopped here yet, in their

local destinations where they belong to be, people refused to accept them, before going to the shelters they had been sent to quarantine centers. The story does not stop here only many people including children, old age adults, pregnant women's and kids lost their lives before reaching their homes, these people suffered from hunger, lack of shelter, suboptimal environmental conditions, and lack of medical facilities in between their commuted paths.

Migrant and displaced children are among the world's most vulnerable populations of the world. Worldwide 52% of migrant children and over 90% of displayed children live in low and middle-income countries where health systems have been overwhelmed and under capacity for a protracted period of time.

Many home countries have very limited scope to reintegrate the large number. With the right policies, these workers can be converted into a resource for recovery. Helping returning migrants reintegrate will also reduce tensions in their home countries, where some communities may fear that returning migrants may bring the virus or take jobs away. Rebuilding the livelihood strategies of returning migrants will allow them to pay any debts related to their original recruitment abroad, avoiding the risk of forced labour and human trafficking, or re-migration through irregular pathways.

**4**

**The frontfoot warriors**

As the covid19 takes a high pace, the constitutional duties of frontline warriors came ahead to protect the nation from this pandemic. The doctors, nurses, healthcare staff, and policemen came into the restless service of 24*7. The pressure on healthcare resources is increasing at a very high rate. So it becomes mandatory in the near future for developing and underdeveloped nations to work in the healthcare and the life sciences field to reduce the pressure on individuals, doctors and police cops to get better performance and flexibility with them.

It's a similar story when looking at skilled health occupations (such as doctors, nurses, and midwives) per 10,000 people. Out of 97 countries with available data, the top 10 are almost exclusively high-income nations. Germany, Norway, Switzerland, the Netherlands, and the US make up the top five, while the Russian Federation is the only non-high-income country in the top 10( source: ILO).

In low-income countries, large parts of the population do not get essential health services due to a lack of health workers, particularly in rural and remote areas.

| Country | Income group | Health sector | | Health occupations | |
|---|---|---|---|---|---|
| | | Employment per 10'000 population ▼ | Female share | Employment per 10'000 population | Female share |
| India | Lower-middle | 43 ▪ | 47% | -- | -- |

*ILO modelled estimates for 2019 for the human health and social work sector (ISIC category Q), latest available national figures for skilled health occupations (ISCO categories 22 and 32) and UN estimates for population.*

Source: ILOSTAT · Get the data · Created with Datawrapper

Apart from this the virtual battle force also came into the existence to support the people to fight the covid19 pandemic. The Disha call-in facilities along with its social volunteering are helping to provide the people to get what precautions and safety measures to be taken and whether to refer to the treatment or not.

The network works on the Oricom software developed by OrisysIndia Consultancy Services, a Technopark-based start-up that has a social support history of its own.

GoK Direct is the app that would be on the Keralites' phones now, giving info on everything from the Chief Minister's announcements to the latest figures.Developed by Qkopy, a Kozhikode-based start-up, this app disseminates information in Malayalam, Tamil, and Hindi.

The flow charts put together by the technical workforce of the Information Technology (IT), Health and Police Department had become popular as a one-of-a-kind exercise in a pandemic scenario.

On the other hand, it has also been seen that doctors are also losing the battle against the covid19 because they are surrounded by their responsibilities and prone to the covid virus.

Till now in India, more than 1000 doctors including nurses and health care staff too had lost their lives in the covid battle. Here we must take a lesson at least those who are on duty for our survival; we must also take care of their lives too.

The same case also with the traffic police too, in the early days of the pandemic more restrictions are there but as time passes,

we have gotten more independence with the cop system. The efforts were appreciatable, the unnecessary travel was restricted for the first few months only essential services were allowed.

The health facilities vary in India along with its demography. For better treatments, people travel from urban and rural areas to metro cities for better treatment and major operations, not only this but doctors also gives referrals to the major higher cities.

### Number of health facilities that reported data over the past three months

| | Jan 2020 | Feb 2020 | Mar-2020 |
|---|---|---|---|
| Total number of health facilities reporting | 204,761 | 201,577 | 155,373 |
| Number of districts reporting | 703 | 702 | 627 |

Source: National Health Mission Health Management Information System

## Covid impact on the education

As the pandemic took its big form, it become essential to shut down all the schools, colleges, universities, and various types of coaching/tuition centers. This becomes a challenging part of the education system to prevent the 1 academic year of students from ruining it.

So the only last option that was left for the teachers is to switch to the various online modes and conferencing applications and software like ms teams, cisco WebEx, zoom, and so on. This becomes hectic for both teachers and students just because of a lack of technical skills and more reliabilities on the conventional education systems, however, the shown by both the teachers and the students were appreciable.

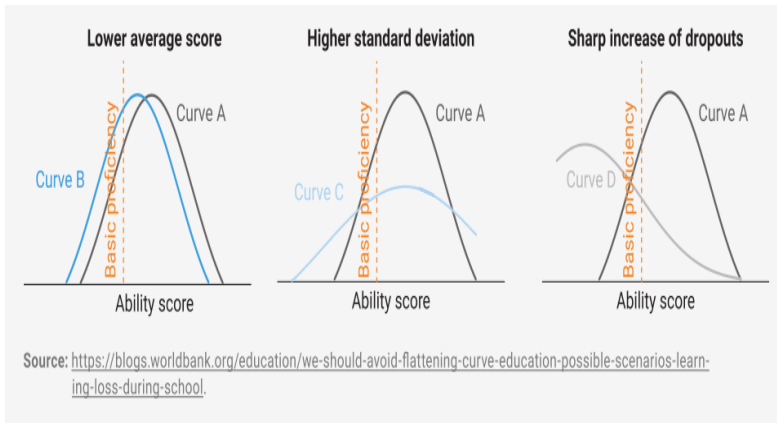This time was a new phase of the education system globally, the whole system switched to online mode. The impact of education, the ability to respond to school closures changes dramatically with a level of development: for instance during the second quarter of 2020, 86% have been effectively out of school in countries with low human development compared with just 20% in countries with high human development.
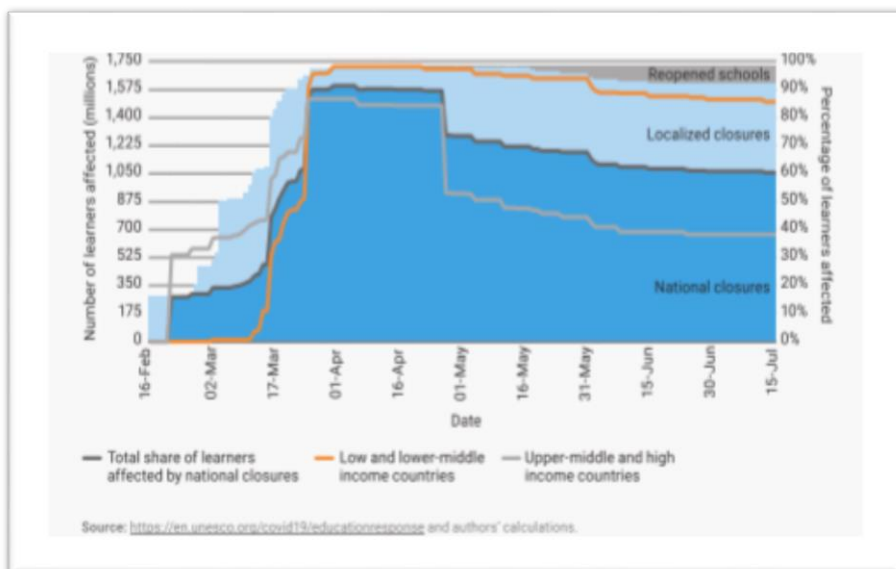
Source: https://en.unesco.org/covid19/educationresponse

In technical and vocational education vulnerabilities among the low-level digitization among the long-standing structural weaknesses have been brought to light by the crisis. The lack of IT (information technology) has been seen clearly. Disruption in workplaces to implement apprenticeship and work-based learning mode has been came into the picture.

In addition to the learning loss, the impact on the household is likely to widen inequalities to widen the education environment. Millions will be pushed towards severe poverty where they have to give up education as the basic need and they are unable to complete primary and secondary lower education this will have major impact sub-Sahara countries as well as Nepal, Pakistan, and Jordan.

Source: https://blogs.worldbank.org/education/we-should-avoid-flattening-curve-education-possible-scenarios-learning-loss-during-school.

The after-condition of the corona will be different. The whole learning ecosystem will be changed. The online class will become the major learning as they will play a vital role in distance education. Although **India TV** also become a popular platform, 32 different channels on DTH were introduced by the government called **swyamprabha** which was a good initiative. Various online programs and certifications also gained a massive boost in covid conditions just to ram up the skills for those who have been layed off and college students. These popular platforms were EDx, Coursera, Udemy, Udacity, Future learn, etc.
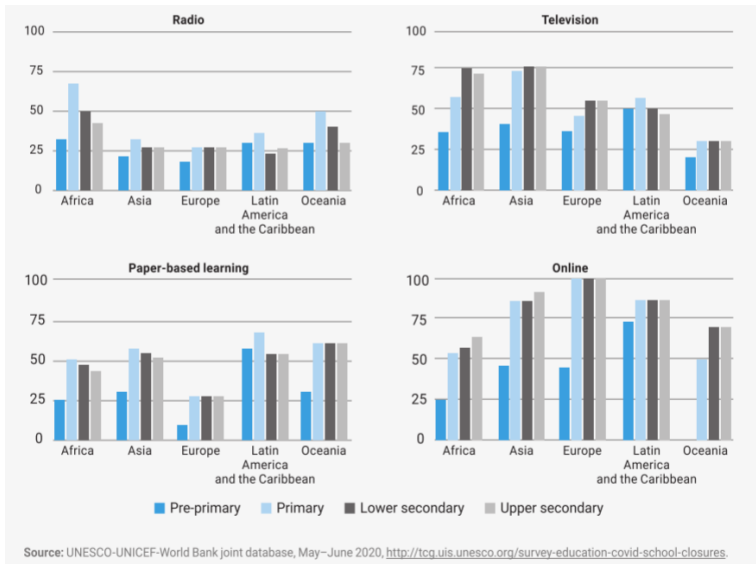
The above figure shows the country's choice of different learning mediums while the school closures in covid situations are influenced by various education mediums.

Non-payment of the teacher's salary not only poses a problem for an individual family and community's well-being but also hinders the delivery of quality education. In short, many teachers may need to turn to alternative sources of income and will be unable to support people in distance learning. In the long term, schools may face teacher shortages due to attrition. The crisis will be a reminder for the governments to take care of the teachers and education.

## The employment crash- layoffs

When the covid was in the middle of the phase i.e. in the month of May and June. Millions of people are striving for basic needs like food and shelter. It became extremely difficult for the daily wagers to survive for themselves and feed up their families. Job loss has an immediate impact on the covid18 crisis.

The short-term policy requirements were come out in favour to supports the MSMEs and expansion of MGNREGA, job creation, social security, and cash transfer, while if we talk the about long-term measures would include a strong public health system, universalization for the social security and policy for the welfare of the rights of the migrants.

On one side people have lost their jobs on the other work from home culture gets into recognition, where working hours are usually expanded by 45minutes to 1 hr. The takeaway from the conference was that overall, there has been about a 25 percent decline in total GDP with the industrial sector (especially MSMEs) highly disrupted and down by 54 percent.

"According to the International Labour Organization, it is estimated that the pandemic could reduce global working hours by nearly 7% in Q2 of 2020 - equivalent to 195 million full-time jobs."

In India, from March-end, most government and private sector companies have resorted to either sacking employees asking them to go on indefinite leave without pay or slashing salaries by as much as 85% – A report by Outlook India.

As per the data suggested by the National Sample Survey (NSS)

and Periodic Labour Force Surveys (PLFS), it is estimated that overall 136 million government and private sector jobs are at immediate risk in post-corona India.

It is very clear that the post-corona conditions won't be easier to survive. The job markets will be limited seats and candidates. The various sectors will get good expansion in post corona like ed-tech start-ups and health care services. Although the IT sector will grow at a constant rate after surviving ups and downs.

McKinsey's analysis suggests that up to one-third of India's entire workforce is vulnerable to reduced income, furloughs, or layoffs as a result of the crisis that, in turn, would largely weaken consumer spending, with knock-on effects across economies. The analysis also suggests that - India needs to create nearly 10 million jobs every year to absorb people moving into the working-age population, besides those who are already unemployed.

To give a good job and better future opportunities we need job craters rather than job seekers. For this entrepreneurs and business enthusiast must come forward with their innovative ideas and explore and purify the opportunities. Tourism, education, and health sector finance will be going to be scalable ideas after the crisis will be going to over.

India has already taken decisive actions to safeguard jobs including the implementation of wage subsidies, allowing freelancers and sole traders to claim unemployment benefits without shutting down their businesses, and supporting working-from-home policies through tax incentives or transfers.

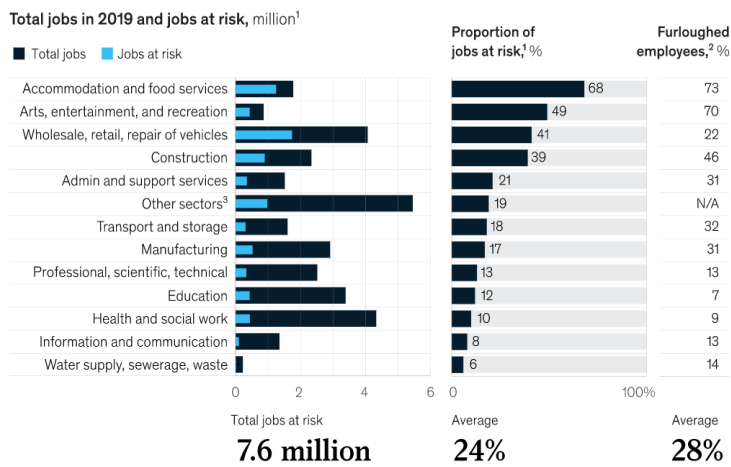Small and medium-sized enterprises (SMEs), which account for

the majority of jobs in India are more likely to be put at risk by the crisis as SMEs account for 68 percent of all jobs in various departments, including food and accommodation services.

But the macro picture shows a concerning loss of employment across all sectors:-

38 million or 70% of jobs at risk in the tourism industry – an estimation by KPMG India

10 million jobs are at risk in the entire textile chain if there are no government-announced packages or subsidies.

In agriculture, India may witness debt-creating paralysis for farmers, if proper measures are not taken.

**Total jobs in 2019 and jobs at risk,** million[1]

■ Total jobs  ■ Jobs at risk

| Sector | Total jobs at risk (million) | Proportion of jobs at risk,[1] % | Furloughed employees,[2] % |
|---|---|---|---|
| Accommodation and food services | | 68 | 73 |
| Arts, entertainment, and recreation | | 49 | 70 |
| Wholesale, retail, repair of vehicles | | 41 | 22 |
| Construction | | 39 | 46 |
| Admin and support services | | 21 | 31 |
| Other sectors[3] | | 19 | N/A |
| Transport and storage | | 18 | 32 |
| Manufacturing | | 17 | 31 |
| Professional, scientific, technical | | 13 | 13 |
| Education | | 12 | 7 |
| Health and social work | | 10 | 9 |
| Information and communication | | 8 | 13 |
| Water supply, sewerage, waste | | 6 | 14 |

| Total jobs at risk | Average | Average |
|---|---|---|
| **7.6 million** | **24%** | **28%** |

Source:
https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-in-the-united-kingdom-assessing-jobs-at-risk-and-the-impact-on-people-and-places#

If you are in a job role where your primary output is on the

computer or the telephone then working from home and remote work conditions will be going to favour you. Thus, various options will emerge in roles related to coding, designing, writing, coordinating on e-mail, customer support, recovery, pre-sales, and post-sales support, creative fields, finance and accounts, recruitment, consulting, advisory, analytics, and data entry. Complete work-from-home, need-based, or rotational/Flexi attendance will contribute to reducing seat costs without compromising on output.

If your role involves physical interaction with tangible assets or other people or is related to physical or data security, expect no change. The first category is where you are in manufacturing, production, repair and maintenance, construction, handling transportation and storage, or working with equipment in a lab. Here, you will continue to go to work until the technology used to remotely pilot drones in the military is cheaply available to the industry. In the second category are roles in patient care. These are some sectors where you can not expect work from home culture.

**US polarization by the George Floyd killing**

In a recent book, why are we polarized the American journalist Ezra Klein explored the depth of political polarization that afflicts the United States.

If you are a Democrat you shop differently, you live in different neighborhoods and you do other sports than you would do as a Republican.

Favoring Republicans or Democrats is ever less a question of transactional politics (what do they do for me?) and ever more one of identity (what does it say about me?).

In brief, the US has two political tribes. Political gridlock, a lack of any compromise to bring the country forward, and an erosion of democratic rule. Klein blames the Republicans and to a lesser degree the Democrats, as well as the political system.

One of them: rediscovering the politics of place. Go local. Instead of spending time on Trump's last tweet, people should give far more attention to state and local politics, where they have a bigger impact and where they are confronted with other opinions in tangible contexts.

In Germany, many people went to the street to demonstrate racism in his name. But practically nobody in Germany knows of Mercedes Kierpacz. The 35-year-old mother of two was working in a kiosk in the German city of Hanau on the evening of 19 February when a man stepped out of a car and shot her dead.

The protest became vigilant and it may swing the direction of the voters toward the US presidential elections. The protest

across the nation on George Floyd's killing will test the notion of voters that provokes both anger and grief.

Could the demonstrations that have devolved into mayhem, looting, and assault lead to victory for President Trump? Will they empower Republicans in the way that Richard Nixon used his "silent majority" and Ronald Reagan invoked the idea that "the jungle is always there waiting, to take us is over" to propel themselves politically in the wake of the riots and rebellion in watts, Newark and Detroit in the 1960s?

The voices had been raised from all over the world from various media both electronic and print media. Various people also raised their voices from all different backgrounds some of them are cricketers like Darren Sammy from West Indies and many others.

In Minnesota, where the protests first began, there are Democrats who worry that voters will turn to the right. The protest was triggered by the people in the US.

The police killed him brutally just because he used the 20 USD duplicate note at the grocery shop. They killed him by putting their knees on the neck of Floyd, they simply arrest him and take them to the police station. The crowd was shouting but they didn't listened.

The protest has taken place is more than 400 cities in the USA and across the globe. In some places, it also takes a violent face. In some places, people were in support whereas in some places people were in opposition.

What Democrats fear most is a repetition of the voter reaction to urban rioting in the 1960s that brought an end to decades of

Democratic hegemony at every level of government as Republicans were able to set much of the federal, state, and local agenda for the next 52 years.

The transformation of voting patterns that manifested in the 1968 election is documented by Omar Wasow, a political scientist at Princeton. In his May 2020 paper, "Agenda Seeding: How 1960s Black Protests Moved Elites, Public Opinion and Voting," Wasow compared voting in predominately white counties close to violent protests in 1968 to those that were not.

His conclusion:

Violent protests likely caused a 1.6 percent to 7.9 percent shift among whites toward Republicans and tipped the election.

In contrast, the Democratic vote in white counties that directly experienced, or were in proximity to, nonviolent protests rose by 1.6 percent.

Based on these calculations, Wasow estimated what the outcome of the 1968 election would have been under a "counterfactual scenario that Martin Luther King had not been assassinated on April 4, 1968, and 137 violent protests had not occurred in the immediate wake of his death."

Under this scenario, Wasow wrote, "Hubert Humphrey would have won an additional 763,040 votes nationally," including

a majority of the votes in five additional states: Delaware, Illinois, Missouri, New Jersey, and Ohio. These swing states would collectively have provided Humphrey with an additional 84 electoral votes and allowed him to win the 1968 election with a total of 275 electoral votes.

The current situation not only raises Democratic concerns over a repetition of 1968 but also a repetition of 2016.

At last, we all are human, we should treat others the way we want to be treated ourselves. Everyone needs love, affection, and respect.

**Locusts swam in east Africa and south Asia**

Locusts are insects similar to grasshoppers and cricket and also their biological family is the same. Locusts have two phases one is solitary and the other is the Gregarious phase. They can be transformed from a solitary state to a gregarious state at any time with certain weather conditions. The environmental conditions are there must be rain, moist soil, and nearby vegetation. And in the gregarious phase, they are capable to make their swarms. They can eat all types of crops and non-crops whether it is grass, fruits, wheat, vegetables, and date palms. This is why complete destruction follows wherever they go.

**How bad locust plagues are?**

The swarm that was found in Kenya in 2020 was 40km x 60km by the dimension that covers an area of 2400 sq. km. in 1 sq. km there as many as 150 million locusts can be possible. They can eat the food which is enough for one-day food of 2500 people. That's why it is also been said that the locust is the only animal species which have a strong economic impact as compared to any other animal species. The locust attack majorly hit Africa, middle Asia, Pakistan, and west India.

**History**

This was the worst locust attack in India in the past 27 years and the last attack was in 1993 that was in Maharashtra. The locust attack was not a trending phenomenon that came instantly in covid. There were locust attacks in ancient history too which were thousand years ago in Egypt. Ancient Egyptians have also

drawn locusts in their tombs.

## How did it happen in 2020?

Due to climate change, the Indian Ocean is supercharging and heating due to which there are heavy rains. Torrential rains hit east Africa in around December 2019, in fact, there are floods too. East African countries were hitten badly by the floods like Somalia, Tanzania, Kenya, and Uganda. Due to these floods, the right environmental conditions were created which are suitable for locusts like rain moist soil, and vegetation. This becomes the opportunity for locusts to breed and change the phase into the Gregarious phase. They traveled Iraq, Pakistan, and then India.

They want to be traveled to India furthermore but at that time cyclone Amphan was also there and the cyclone winds supported their migration movement. Locust swarms hitted the areas like Delhi, Uttar Pradesh, Madhya Pradesh, Rajasthan, Haryana, and Punjab.

## Solutions

The very common solution to blow away the locust attack is pesticides but somehow they are dangerous for the crops and yields and ultimately the food we eat. If we talk about eco-friendly pesticides, they don't have a strong effect on the locus and these are also not sustainable solutions. Here Pakistan comes up with a good idea, in a district Okara, the people and the farmers have trapped the locust and used it for chicken feed as food that contains good protein and this also generates profit. For this solution, the credit goes to Mohd. Khurshid who is a civil servant in the ministry of national food security and research in Pakistan and Johar Ali- a biotechnologist at the Pakistan agriculture research council. When locusts are used as

chicken feed they contain as much as 70% proteins. Indian farmers must learn from this idea and should implement them.

## A fragile economy

According to the IMF, it is expected that the global economy will shrink down by 3% which is 6the steepest since after the great depression of the 1930s. Amid the coronavirus pandemic, several countries tried to restore the pandemic to lockdowns to "flatten the curve" of the infection. The lockdown just means to confining millions of people in their homes and shutting down all business activities.

The covid19 pandemic has pushed the global economy into a recession which means the economy starts shrinking and the growth stops.

In the US covid19 disruptions led to millions of people filing for unemployment benefits. In April alone, the figures were at 20.5 million, and are expected to rise as the impact of the pandemic on the US labour market worsens. Since March 21, more than 36 million filed for unemployment benefits which is which quarter of the US work-age population.

**Oil and natural gas**

Due to a fall in travel and a reduction in transportation activities global industrial activities have been affected. Oil prices fell which accounts for 60% of oil in demand. Not only this has the demand for natural gas felt as a result of which many Chinese LNG buyers halted their imports as storage tanks filled.

The crude oil prices have already been affected in a row between OPEC, the group of oil producers, and Russia. The coronavirus drove the oil prices further.

Brent crude is the benchmark used by the Europe and rest of the world. If the price is dipped below 20$ to the lowest in past 18 years.

**Industrial metals**

Due to the lockdown in china us and Europe, the demand for metals has been reduced as the factories shut down, as per IMF, China accounts for roughly half of the global demand for industrial metals.

**Food and beverages**

IMF projects a decrease in food prices by 2.6 percent in 2020, caused by supply chain disruptions, border delays, food security concerns in regions affected by Covid-19, and export restrictions.

In the lockdown, the prices of cereals, oranges, seafood, and Arabica coffee has been increased, and the prices of tea and meats have declined. Further, the decline in oil prices has put downward pressure on the prices of palm oil, soy oil, sugar, and corn.

**Online business sector**

The online business share in today's world is 950 billion USD. It contributes 10% to the Indian GDP and showed a drastic in the employment sector in FY19 viz 8%. Its major segments are the household and personal care products (50 %), the healthcare segment (31%), and the food and beverage sector (19%).

Sectors that depend on imports such as electronics, pharmacy, consumer durables, etc are facing a downfall causing a huge rapture across the value chain. As a splash of relief came the RBI

announcement of a three-month moratorium on repayments of loan and a reduction in the repo rate as most of the MSMEs depends on loan funding from the government.

The global economic reforms also shifted employment downwards. Many people have lost jobs and the extreme layoff by the companies is also a reason for the downfall of the economy.

**Risk of a recession**

If the economy is growing which generally means more wealth and more jobs.It is measured by looking at the percentage change in the GDP, or the value of goods and services produced, typically over three months or a year.

**How countries have coped up**

As per the WEF, small businesses and SMEs are crucial to maintaining their financial stability and employment. In India government come up with the Atma Nirbhar Abhiyan package to support the MSMEs. In form, if increase in the credit guarantees.

Many advanced economies in the world have rolled out support packages. While India's economic stimulus package is 10 percent of its GDP, Japan's is 21.1 percent, followed by the US (13 percent), Sweden (12 percent), Germany (10.7 percent), France (9.3 percent), Spain (7.3 percent) and Italy (5.7 percent).

South Korea stands out here because business and economic activities here are not completely stopped and therefore economy was not severely affected.

In US the government has also given the "forgivable" loan to

small businesses to enable them to retain workers. Yes, the loans are forgivable means they don't have to repay them with fully provided conditions to be met.

Germany went into the crisis having surplus finances since 2012. The crisis will bring that run to an end. The nation adopted a supplementary budget that covers spending on healthcare including vaccine research. The scheme kurzarbeit has often been credited with helping limit in the    rise in unemployment in the wake of the financial crisis. Kurzarbeit, Germany's short-time work scheme, was instrumental in keeping employment stable during the global financial crisis.

**Boost in the OTT services**

The pandemic has shown an enormous impact on various businesses and industries in unpatrolled ways. The scenario is like that people are stuck at the home, schools/ colleges are closed, gyms are closed, and shopping centers and the theatre are shut down in order to curb the spread of the covid19.

The appetite for content consumption has been increased over the various OTT platforms like Amazon prime, Netflix Disney hotstar, etc. The scenario was like YouTube and Netflix had to reduce the standard video quality. According to a recent survey by the mobile marketing platform InMobi, 46% of viewers are watching more content online. Another consumer survey conducted by Hammerkopf has found that OTT consumption primetime has moved to 7 pm onwards, as opposed to 10 pm-12 am before

**Some substantial high Impact points of coivd19 effect on the OTT services-**

**1 double streaming rate**-during the pandemic. According to Brian Fuhrer, SVP, Nielsen, on April 4, Americans watched 27 billion minutes of streaming content on TV which is 50,000 years of content in. just one day, versus about 70 billion per week a year ago. Breaking all the records was Prime Minister Narendra Modi's 21-day lockdown announcement which was watched by 197 million viewers.

**2. Consumers exploring the new entertainment options-** while viewing movies and web series over OTTs, has given businesses a good move to understand the consumer attitude. With most

of the films being premiered behind a paywall – the aim of these acquisitions is essentially to drive subscription revenue

**3. the lack of live sports is stimulating consumption**- 54% growth in news, 60% spike in gaming, and a 134% rise in content consumed for entertainment.

**4 tremendous changes in video compression technology-** this has helped to gain competence and reduced bandwidth consumption in the last few years. There will be some shifts in streaming behavior post-pandemic and video streaming service providers should invest in operating expense optimization to cope with changes in consumer streaming behavior.

As now people have a maximum time to stream content, the OTT services are low-cost subscriptions that come up with a budget-oriented alternative for entertainment.

In the period between March 1 and 21, gaming witnessed a 41 percent increase in time spent while entertainment and OTT registered a 34 percent increase. According to industry sources, Disney+Hotstar bought Akshay Kumar's Laxmi Bomb for roughly about Rs 150 crore. The Cellular Operators Association of India asked OTT platforms to reduce the quality of the video to reduce the strain on the cellular network infrastructure.

So now OTT will be a new trend in the post-pandemic times and it will take over the multiplex viewers. The long hours web series and its multiple seasons will surely drive the audience which will be good to see in later times.

**The rise in ed-tech start-ups and businesses**

As the global scenario is changing, the demands for skillset are increasing at a very expeditious rate. Not only the knowledge but the ability to grasp the trending technology and to make a balance along with it and working on it will make you sustain in the employment and business race. Now businesses are not only adopting technology but also relying on them too. If there's one sector that continues to see extraordinary growth during these unprecedented times, it is education.

A report by BARC and Nielson India that there has been a 30% increase in time on education apps on smartphones during lockdowns time.

Byjus is India's earliest and most valuable ed-tech start-up. The time spent on its app increased from 70 minutes pre-lockdown to 91 minutes during the lockdown.

Great learning is a Gurugram based startup founded by Mohan Lakhamraju, former head of the Tiger Global said it saw rising demand for upskilling in digital competencies like data science, analytics, AI, machine learning, cloud computing, cyber security, and digital business over the last year, and especially during the lockdown.

Vedantu, board infinity, unacademy, and topper have also shown massive growth in their learners. Apart from this skill and certification courses were also became very trending and got a huge demand among students, fresher and job seekers to upgrade their skills and knowledge.

Already this year education-focused startups have raised twice

the funds they did in all of 2019. Venture capital firms have invested about $795 million in Byju's, Unacademy, Vedantu, InterviewBit Academy, and Doubtnut.com, according to data provided by Venture intelligence.

As we all know that data science, machine learning, artificial intelligence, and blockchain are the top trending technologies, the company and workforce rely on these, which is a big clue for college students to work on it and get their desired jobs, because these are the things that companies are expecting with students to land in an industry with prerequisites so they have less initial efforts in training. Coding among kids becoming the rage in India in the ed-tech sector right now.

By capitalizing on this development, Edtech startup 'Learning matters' launched 4 products: Tara (virtual voice teacher), Tool Box (activity-based teaching), Star Teacher and Konnect (Teacher skill development), and Kengine (Library of videos).

As the world is inclining towards automation, more people from technical backgrounds are required to be familiar with automation so that it will be easier to work with it. Indian workers have also recognized the importance of upskilling in the current environment. Python and data science have been the two trending search topics during the lockdown. Pre-lockdown, the UPSC syllabus was one of the most searched keywords, which has now seen a drop in traffic.

Apart from this people also used Coursera, Edx, Udemy, Udacity, and Solo learn, for various types of nano degree programs and certifications which also collaborated with various top MNCs and global institutions. People have also learned soft skills, business management, leadership skills, and personal development too, which are also very popular. The use of

Artificial Intelligence will help to customize learning to suit every child's unique needs and the one-size-fits-all approach followed in traditional classrooms will make way for a more customized approach that eventually leads to better learning outcomes.

**Increased resilience on the robots**

As robots are becoming a part of the industrial revolution, they are playing a very crucial role in the development of things by reducing human efforts or making the human task easier. Robots have the potential to be deployed for disinfection, delivering medications and food, measuring vital signs, and assisting border controls. As epidemics escalate, the potential roles of robotics are becoming increasingly clear.

For disease prevention, robots of controlled UV rays are used as surface disinfectants because covid19 is not only transferred from person to person but also from contaminated surfaces. You can imagine in the future when you enter the hospital waiting room, instead of encountering a person you are facing a robot, that can help you, that hands-free, touch-free speech interface will be in more demand in near future.

In china disinfectant robot UVD was in high demand. A large number of robots are ordered by the hospitals which are manufactured by Denmark blue ocean robotics. These robots have played a key role in controlling the virus in Wuhan, the epicenter of the virus.

While changing times, robots play an important role in the field of medicine and health care systems. It will not help in just assisting the patients but also keep doctors and health care staff safe.

Frontline robotics application includes cleaning and disinfecting the surface area to make humans risk-free. From service robots delivering food and essentials to drones and mobile robots

delivering medicines and consumables like PPE, robots have a clear role to play in the movement of materials and products.

Walmart, the USA's biggest retailer is using robots to scrub the floor. Robots in South Korea have been used to distribute temperatures and hand sanitizers.

Including robotics artificial intelligence is also playing a very crucial role in the teaching sector where a student will interact with a virtual teacher this will also be helpful in gyms and fitness centers.

Phygital is becoming a new customer behavior attraction that is bridging the digital world to the physical world to bring out a new customer experience. Now more than ever, companies and business owners must find ways to include and integrate their physical stores into the online experience.

If we talk about pepper, is the world's first social humanoid robot able to recognize human faces and basic emotions, developed by Softbank robotics. Pepper is able to send messages to customers about any specials, their receipts, and much more. Pepper is bringing the online world to the physical world. It can handle anything which we can do online.    EDEKA, which counts over 4,100 stores, is the first supermarket chain in Germany to use a humanoid robot as a COVID-19 measure.

Robots were first adopted by AIIMS in India and later on by various multi-specialty hospitals. These robots we 92cms tall, move at a speed of 2.9km/h    record all activities using their in-built three-dimensional (3D) data and high-definition (HD) camera, and also connect patients with their friends and family members via its 10-inch screen. These humanoid robots use LIDAR (light detection and ranging) and SLAM (simultaneous

localization and mapping) technologies to detect objects in their path to avoid any collisions and have more than 60 sensors. Additionally, they use open API (application program interface) to allow further customizations, if required. Created by Milagrow Robotics, their battery capacity is 12 hours on a single charge and takes four hours to recharge.

Mitra, another robot that is deployed at Yatharth super specialty hospital Noida. The main function of this robot is to connect patients and their family members and to patrol the ICU units. Its piercing eyes are equipped with facial recognition technology to help it recall people it has previously interacted with. A tablet attached to Mitra's chest allows patients to see loved ones, as well as medical staff unable to access the wards.
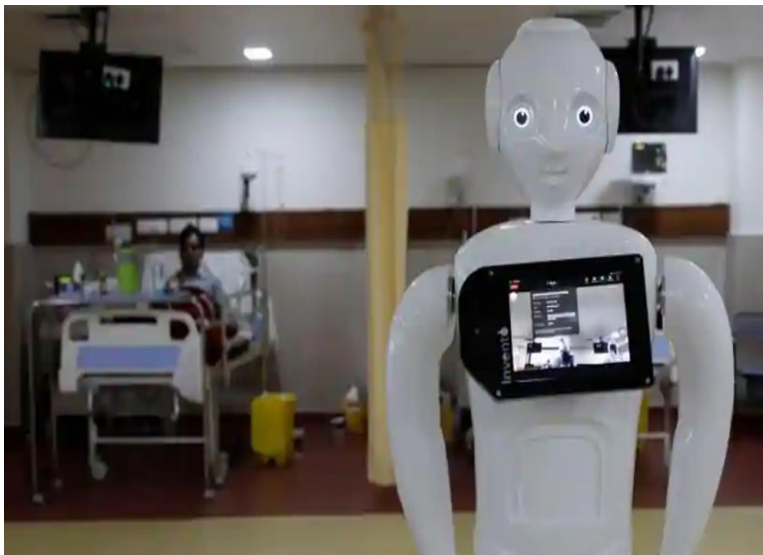


mitra robot

**Telemedicine-benefits and challenges**

Telemedicine is a science that allows doctors to take care of patients remotely without any physical interaction. In brief the remote diagnosis of patients by doctors with the use of telecommunication technology. The pandemic has caused a significant disruption in healthcare services which has accelerated the use of telemedicine or virtual consultations.

News and media coverage of the recent spurt in E-clinics have bode well for virtual medical consultations as about 35% became aware of telemedicine through this medium. The option to access healthcare facilities remotely for health purposes by the use of digital information and communication technology is driving the growth of telemedicine at a time when people are unable to make physical visits to doctors.

Some of the top platforms that are used in big numbers are Practo, foreign OPD, and DocVita. The most significant limitation to telehealth use in the COVID-19 response right now is that while some hospitals and large physician practices are equipped to deliver care in this way, most hospitals and private practices are not,

There are some limitations; the main one is a lack of endpoints within hospitals to be able to implement telemedicine – meaning limited access to the hardware. While some hospitals may have dedicated technology for programs like stroke care, hospitals are now repurposing some of these endpoints for other work like tele-triage, while many telemedicine programs are hardware-agnostic, providers still need to ensure this technology is equipped with the right tech for the type of exam,

such as camera quality, sound, etc

Another issue is broadband access – some hospitals struggle with running a quality connection within their facilities and now we are faced with taking this to potential new areas of care, Wi-Fi connections need to be considered. The acoustics within a building can also be a limitation depending on the room construction. However, with the introduction of the Ayushman Bharat Scheme, the Indian government has come up with ICT (Information and Communication Technology) focusing on the development of the health sector in the country. The scheme includes telehealth care for better medical facilities.

With telemedicine relying 100% on technology, cyber security has become a necessity. The healthcare industry is no stranger to cyber attacks, but with telemedicine becoming increasingly popular, information protection has become a top priority. We will continue to see massive changes in the way the telemedicine industry goes about protecting confidential information.

The combination of patient information, advanced algorithms, and remote interaction platforms for communication with physicians is turning into one of the great opportunities of the moment. Overall, patient-doctor interaction is far from what it should or could be in most countries, and the pandemic has only made this evident.

With more people becoming aware of telemedicine and its many options, the world will soon be taken by storm by this growing industry. The trends prove that telemedicine has gained momentum and it shows no signs of slowing down anytime soon.

## Dark kitchens

Dark kitchens (or ghost or virtual restaurants) are commercial establishments with no physical restaurant dining space in the traditional sense. Instead, these kitchens are designed to produce food that can only be ordered through a mobile app. This model offers a number of benefits to restaurants and hotels, including:

**low occupancy cost**

**low production rent**

**reduce labour cost**

Restaurants, food joints, and hotels are actively looking forward to these dark kitchens because of delivery services as they diversify their focus from in-house diners to at-home delivery. There are many examples across the globe in the U.S, Europe, and the Asia Pacific, like Deliveroo has been working with a number of mall owners to support their F&B tenants. These kitchens may be "dark," but they are offering a bright spot for many in the food industry during this incredibly challenging time.

Swiggy launched its cloud kitchen initiative "Swiggy Access" in 2018 and since then it has created over 1,000 kitchens for its restaurant partners. In India and the globe, all the food ventures are shifting towards the dark kitchen like KFC and McDonald's to expand consumer access.

New Delhi based Lite Bite Foods, which runs restaurants such as Punjab Grill, Pino's Pizza, and Zambar, said it will add at least 20 dark kitchens this financial year to expand its business. Bengaluru-based Chai Point, which already runs dark kitchens, plans to add more on the back of growing consumer demand for convenience and access to food services across multiple channels.

The company, which runs more than 218 restaurants across India will add at least 20 dark kitchens in this financial year for some of its key restaurant brands, including Street Foods by Punjab Grill, Zambar Tiffin, Asia Seven Express, and Pino's Pizza.

Dark kitchens are typically no-frills attached kitchens that are developed to service high-demand areas. They work as back-end kitchens that service delivery orders.

The cloud kitchen sector is dominated by heavily funded internet-first restaurant players with their core strength in tech, process and discount doles. Equipped with delivery fleets backed by huge funds, online food aggregators have also expanded the market for online ordering in India, this results in the cost of customer acquisition having to come down and making the dark kitchen business more viable.

**More Contactless interfaces and interactions**

A touchless tomorrow is not just a remote possibility but a future gateway for a new style of interaction among customers and retailers. A new door of various technologies and innovations. A couple of years ago, the hype was that we are moving towards a world free of passwords, touchscreens, and pins. Then it did not sound to be true, but now it is a reality.

As there is so much fear of contracting a disease. This also pushed for innovation in contactless biometrics too. These include thermal body imaging, retinal scanners replacing pins, etc. Besides, the world has also welcomed the idea of live video streaming for future seminars and events.

There will be some new consumer trends that will be seen in the near future are listed below:-

Touchless interfaces have become integral to the customer experience in a health and safety-conscious world.The pandemic is offering a unique opportunity to accelerate the use of voice-based interfaces in physical settings.The pandemic has caused an upsurge in the adoption of facial recognition technologies.

Mobile-based contactless transactions, such as retail store self-checkouts that use mobile apps, are gaining ground as consumers try to avoid any shared interfaces.

Consider, Valyant AI, for instance. This Colorado-based company is pilot-testing a new way of ordering food at quick-serve restaurants, using a voice-controlled kiosk supported by artificial intelligence. This can enable quick-serve

restaurants (QSR) to employ a voice ordering system. The voice-ordering kiosks utilize Valyant AI's conversational AI software to simplify the order-placing process. The ordering process of this technology is quite akin to the traditional one. As soon as a car approaches the drive-thru, it is detected by a sensor. Then the customer has to push a button on the kiosk to initiate the conversation with chatbot Holly

Apple's voice-user interface, Siri, is already being used to send voice texts and for enhanced dictation for text message transcription. In the future, more business brands will employ a voice-user interface to create a more personal connection with customers using their website or a dedicated app.

India-based ICICI Bank introduced voice assistant services during the pandemic. Consumers could use voice-enabled smart speakers to access a range of banking services, such as account details, credit card history, or transaction details. In 2019, Spain's CaixaBank rolled out a new service to give customers the option of using facial recognition technology to withdraw cash from ATMs instead of using their personal identification numbers

In-store ordering-McDonalds announced the introduction of voice recognition for drive-through orders in September 2019.7 During the pandemic, this has continued. Starbucks, for example, when it recently re-opened some stores in the US, emphasized the availability of voice-based ordering.

In-store engagement-H&M previously introduced smart mirrors to its stores, which are enabled by voice and facial recognition. Solutions are also evolving to provide product recommendations in-store, with voice being positioned as a "store assistant".

In car functionalities-Automobile, players like Volkswagen are already positioning voice assistants as a central interface for the car's infotainment systems and for drivers to control the vehicle. , Volvo Cars India and BMW India have initiated contactless programs that allow customers to book car services online from the nearest dealership through mobile websites and third-party applications. Customers can collect newly purchased cars from a designated delivery location by unlocking the car via the mobile app, Volvo Cars India and BMW India have initiated contactless programs that allow customers to book car services online from the nearest dealership through mobile websites and third-party applications. Tesla has rolled out contactless deliveries enabled by the Tesla mobile app. Customers can collect newly purchased cars from a designated delivery location by unlocking the car via the mobile app

**Self-checkouts**- Back in 2016, MasterCard had launched its "selfie pay" application in Europe for payment authentication. This allows a customer to simply make an online payment by displaying their face to their smartphone cameras.

Several technology companies have also been working on enhanced versions of facial recognition that can help accurately identify individuals even when they are wearing masks – a challenge with existing facial recognition systems. China-based Hanwang Technologies, for instance, has devised a system that can identify mask-wearers with 95% accuracy

**Computer vision**- computer vision is the subfield of artificial intelligence. It allows the computer to get a detailed understanding of the visual through the images and the videos.

**Application in social distancing and traffic management-**A range of tech companies have come up with use cases and

prototypes for tracking and monitoring social distancing norms, using multi-object tracking in three-dimensional spaces. US-based Numina has developed a tool that has been used to understand how social distancing is being followed in New York City, the worst-affected megacity in the world.

**Application in physical retail stores-**Computer vision has proven to have numerous applications in brick-and-mortar retail stores. These include automated payments, shelf management, theft prevention, and employee performance monitoring. Amazon Go has already begun implementing automatic checkouts and payments using computer vision. As with facial technology, this helps deliver a contactless store experience, thereby reducing the chances of infection

**Application in patients identification**-Radiologists have been developing computer vision use cases that identify COVID-19 positive cases, using techniques such as segmentation of CT scan imagery. This helps radiologists accurately detect lung infections, a potential indicator of COVID-19. Alibaba Group has developed an AI-based diagnostic and analytical tool that uses CT imagery to detect the virus with 96% accuracy and in less than 30 seconds.28 Thermal imaging is another computer vision-enabled technique that can be used to detect whether people are infected by reading body temperature.

Overall these are the new door of opportunities that will not only change the world but make a new and much safer way of living with more advanced technologies.