The Next New

Navigating the 5 th Industrial Revolution

PRANJAL SHARMA

Pranjal Sharma is Ex head of Bloomberg India and a board director in a few companies. He writes on technology, globalization and inclusive growth. The Next New is his third book.

Prepared people are core to the success of making things . The winning hand is a highly trained, engaged workforce working in concert with cutting edge technology and automation.

The 4 th industrial revolution was about the application of emerging technologies which were connected, interactive an intuitive.

The 5 th improves upon the fourth, it is more caring, the additional objectives are sustainability, governance and social impact.

The 5 th industrial revolution = (ESG + 4 th Industrial revolution) x SDGs

The key pillars of the 5 th Industrial revolution are:

Technological breakthroughs like AI, material science
Values, ethics, safety and
climate change goals and sustainability.

Managing change has never ben easy. And today, change is on every front- technology, regulation, geopolitics, consumer preferences and climate change.

Confronted with change, CEOs often loathe giving up a revenue generating model. They hold on to a dying structure and lament when it collapses.

The new space industry is composed of more than a 1000 companies worldwide. Small satellite constellation architectures, reusable launch vehicles, space travel and other technologies have attracted new investors to this industry.

In the coming years, there will be an increase in public and private space exploration with a converging interest in moon exploration.

The increasing use of drones in various civil and commercial applications due to their superior endurance, low operation costs and enhanced payload capabilities has resulted in their increased production and the growth in the market.

In early 2022, more than 2000 commercial drone deliveries were taking place daily. Walmart and amazon are doing drone deliveries this year. The cost of single package delivery is between $ 2 and 1.50

Drones in agriculture can create a $ 100 billion GDP boost and help millions get better livelihood. The drone applications include seed propagation, pesticide spraying, yield protection, land records, insurance assistance and crop monitoring.

The world population is expected to touch 9.7 billion by 2050. the agricultural sector will need to push itself by 70 % compared to the current production standards to provide food to this level of population.

Agriculture has transformed into a technologically intense and data rich industry with guidance systems, variable rate technology, IOT, AI and remote sensing.

At present, precision farming has become one of the most significant applications of IOT technology.

The future is in vertical farming and vertical farms can use 70 pc less water than traditional farms, which is critical in drought prone areas.

Emerging new technologies are now bringing deep changes in the way food is prepared, stored and disposed.

The rise in demand for 3 D printing of food can be attributed to the critical need to reduce wastage. Hospitals can install 3 D food printers since they need to serve customized food to their patients.

Digitization in food is streamlining quality, regulator restrictions, seasonal changes, hygiene, low shelf life and higher scale of production.

According to McKinsey, three fourths of food service and accommodation tasks will get automated. Kitchens will get automated fast.

Metals are tough and solid, they stay reliable in the shape or form they are created.

The discovery of a new category of shape memory materials made of ceramic rather than metal could open up a new range of applications.

A pair of jeans needs 2500 gallons of water, a pound of chemicals ad large amounts of energy.

Green jeans using new chemicals etc. need 92 % less water and use 30 % less energy.

The increasing demand for environmentally friendly characteristics has been most observed in the coatings industry in the last ten years.

The demand for adhesives has increased in healthcare, electrical, electronics and automotive industries.

The materials market is seeing a huge disruption, there is demand for lightweight materials in industries ranging from aerospace to sporting goods.

The capability of composites to maintain a greater strength to weight ratio allows more efficient structural and aerodynamic designs. Car manufacturers are using new lightweight materials.

High performance plastic has emerged as a key material in the 3D printing material market. For this 3D market, plastics are used in filament form while metals are in powder form

By themselves robots might not be a mass product right now, but will find use in mining, energy, manufacturing and construction.

In the 5 th industrial revolution, the goals of efficiency are being complemented by sustainable production objectives.

There is a surge in demand for batteries due to increased automation and battery operated material handling equipment.

According to markets and markets report, the cost of lithium ion batteries would decline to $160 per kwh by 2025, which will fuel the adoption of batteries across various applications.

In September 2020, Samsung announced the launch of wireless charging that can charge 3 devices simultaneously.

Every year, consumers expect more and more form their devices and an always charged battery is one, RF wireless charging will make than happen.

Drones are new in Japan where they have been used in agriculture for 30 years. Drones have the ability to accelerate internal delivery processes between production points and use space better.

A cobot is a robot that physically communicates with people in any shared workspace.

AGVs – automated guided vehicles were used as towing trailers. Vehicle to everything or V2 X is the next big step that will unlock the power of AGVs.

Companies that want to keep up with technology have to invest as much in skilling as in technology.

Uber has partnered with Motional, a JV between Hyundai and Aptiv to deploy driverless cars. These cars are there since December 2022, they are for daytime rides and have a human safety operator in the front seat.

Car hacking can be as dangerous as car jacking. The cybersecurity for cars is becoming as important as for other connected devices we use.

Cars of the future will be like supercomputers on wheels, it is moving from hardware to software defined mobility platform.

Self driving cars are currently base don the level of human intervention required to operate the vehicles. 0 to 5 is the scale where 0 is completely manual control and 5 is completely autonomous.

Saudi Arabia plans to have 30 % EVs by 2030 and eliminate planet warming emissions by 2060.

People will continue to move but the vehicles they move in will take far more independent decisions on their own.

The next key development to smart highways is the rise of automated toll management.

Roads and highways are the intersection of smart cities and smart mobility.

2022 is the year 5 G matured. 205 operators in 80 countries ran 5 G.

The age of mass customization is being driven by predictive technology in apparel. The first question for a consumer is fit.

A full body 3 D scanner will happen soon.

The green digital economy is happening. Four things are leading it –
sustainability
energy storage
digital in energy
smart transmission

China is a growing mkt for green hydrogen

Prevention is better than cure and new technologies are helping healthcare providers to know more about patients before a formal diagnosis is done.

Market size estimates

$ billion	2018	2020	2021	2022	2023	2024	2025	2026	2029	2030
Ride sharing end use mkt			1.6							4.6
Electric aircraft market										27.6
Sustainable aviation										15.7
Food and agriculture technology &products mkt	494.5				729.5					
Precision farming mkt				8.5						15.6
AI in agriculture		1						4		
Plant based meat market		1.6								

Market size estimates

$ billion	2018	2020	2021	2022	2023	2024	2025	2026	2027	2030
Paints and coatings			184					212		
Biodegradable plastics mkt			7.7					23.3		
Global light weighting material mkt			90					130		
Composites		76.2						126.4		
3D printing material mkt		1.6					4.5			
Global smart manufacturing mkt			88.7						228.15	

Market size estimates

$ billion	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030
Battery technology mkt		85.9						152.3			
Wireless charging mkt				4.5					13.4		
NFC wireless charging mkt				0.03					1.36		
Global AI chipsets mkt			7.6						57.8		
Global automotive cybersecurity mkt			1.9					4.0			

Market size estimates

$ billion	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030
Cybersecurity mkt				**218**					**345**		
Cloud security mkt				**41**					**78**		