

NATIONAL**75th anniversary of establishment of Azad Hind government observed**

75th anniversary of establishment of Azad Hind government observed October 21, 2018. Prime Minister Narendra Modi announced launch of national award in name of Netaji Subhash Chandra Bose to honour those involved in disaster response operations.

The national award named after Netaji Subhash Chandra Bose will be given every year to police personnel who do excellent work in rescue and relief operations during any kind of disaster. It will be announced every year on January 23 i.e. on Netaji's birthday.

The award will help to recognize exemplary services rendered by National Disaster Response Force (NDRF) and State Disaster Response Force (SDRF) personnel in rescue and relief works during the time of any disaster.

The Azad Hind Fauj

Indian national movement grew even more strong after the formation of the Indian National Army (INA), popularly known as the 'Azad Hind Fauj'. A pioneering role in its formation was taken by the Indian Independence League, an association formed by Rash Behari Bose. General Mohan Singh was an important leader of this army. The army comprised largely of Indian prisoners of war who were serving under the British and had been captured by the Japanese during the war. Some Indians settled in South-east Asia also joined this army, raising its strength to about forty-five thousand soldiers.

In AD 1943, the leadership of Azad Hind Fauj passed into the hands of Subhas Chandra Bose, also called 'Netaji'. He was a very popular leader especially among the youth. On 21 October 1943, he proclaimed the formation of the Provisional Government of Independent India in Singapore. He went to the Andamans and hoisted the Indian flag there. In AD 1944, the Azad Hind Fauj took part in the attack on the north-eastern parts of India to free the country from British rule. Netaji also took the help of Japan to organize an anti-British revolt. His slogans of 'Delhi Chalo' and 'Jai Hind' won many supporters to his cause. Women also joined the army in large numbers. A separate women regiment called the Rani Jhansi Regiment was created. It was led by Lakshmi Swaminathan.

The Azad Hind Fauj failed to liberate India from British rule. Subhas Chandra Bose was reportedly killed in an air crash. The brave soldiers of the Azad Hind Fauj, however, become national heroes and songs of their bravery were sung throughout the country. Ram Singh Thakur was composed by the inspirational song "Kadam Chacha Ho Jaay" of Azad Hind Fauj.

Netaji Subhash Chandra Bose

He was great Indian freedom fighter born on 23 January 1897 in Cuttack, British India (now in Odisha). Initially, he had joined Congress and was the president of the Congress during 1938-39. Later, due to differences in Congress, he resigned from Congress and established Forward Bloc. He tried to liberate the country through the Azad Hind Fauj.

India's longest river bridge will be built on Brahmaputra river in Assam

- India's longest river bridge with total length of 19.3 kilometers will be built on Brahmaputra river in Assam. This bridge will connect Dhubri of Assam to Fulbarani of Meghalaya.
- At present, India's largest river bridge is Dhola-Sadia bridge, its length is 9.15 kilometers.
- This bridge will have total length will be 19.3 kilometers and will be four-lane. Its construction will be completed by 2026-27 and will be public-funded work.
- Japanese Finance Agency (JICA) has approved the loan for this project as part of road infrastructure improvement package in the north-east after assessing the economic benefit of the big project.
- At present, the road connecting Assam and Meghalaya is about 200 kilometers long. This bridge will reduce travel time to 15-20 minutes to cross the river after it becomes operational from two and a half hours.
- Two northeastern states of Assam and Meghalaya will be connected by NH127B with the help of this bridge.

INTERNATIONAL**US to pull out of Intermediate Range Nuclear Forces (INF) treaty signed with Russia**

United States (US) President Donald Trump has announced that US will unilaterally pull out of three-decade-old Intermediate-Range Nuclear Forces (INF) treaty signed with Russia during Cold War.

What exactly is the INF treaty?

- For decades during the Cold War, the United States was obsessed with defending the homeland against the Soviet Union's nuclear-tipped intercontinental ballistic missiles.
- But by the late 1970s, it confronted a new threat from the Soviet nuclear arsenal: the deployment of shorter-range ballistic missiles capable of targeting America's NATO allies with little advance notice.
- The United States responded with what the inexorable logic of the Cold War demanded: stationing similar missiles, capable of striking the Soviet Union, in Western Europe. But it simultaneously pursued negotiations that culminated in a 1987 agreement between US President Ronald Reagan and his USSR counterpart Mikhail Gorbachev.

- The treaty banned all nuclear and conventional missiles, as well as their launchers, with ranges of 500–1,000 km or (short-range) and 1,000–5,500 km (intermediate-range). This treaty was central to ending arms race between two superpowers during cold war and protected America's NATO allies in Europe from Soviet missile attacks. It was designed to provide measure of some strategic stability on continent of Europe.

Reasons of US withdrawal

- US President Trump has alleged that Russia has violated treaty and has been violating it for many years.
- This violation comes after Russia's alleged development and deployment of Novator 9M729 missile (also known as SSC-8), that could strike Europe at short notice.
- Accusations of Russia violating this treaty pre-dates Trump presidency and go back to 2008 during President Obama administration.
- Under former President Barack Obama raised issue of Russia testing ground-launched cruise missile with Russian President Vladimir Putin in 2014.
- But Russia had denied allegations and raised counter-allegations of the US installing missile defence systems in Europe. While two countries failed to find resolution using dispute resolution mechanism in treaty, US continued to remain party to treaty under pressure from its European allies.

This decision is part of the US policy course to withdraw from those international legal agreements that place equal responsibilities on it and its partners and make vulnerable its concept of its own 'exceptionalism'. The unilateral withdrawal from this treaty will allow US new nuclear weapon options in Pacific in its efforts to counter China's growing influence. There are also concerns that unilateral termination of this treaty could mark beginning of new arms race between US and Russia.

Moscow is in a very different position and could rapidly expand deployment. The number of operational 9M729 missiles has been quite limited, but released from its official obligations under the treaty, Moscow could deploy more units rapidly.

Russia could also effectively reclassify the RS-26 Rubezh, an experimental system that has been tested just above the INF Treaty's 5,500-kilometer limit. To avoid violating the INF, Russian officials previously described the RS-26 as an intercontinental ballistic missile. However, it could form the basis for a missile of a slightly shorter range if Moscow wished to boost its INF forces — without counting it under the U.S.-Russian New Strategic Arms Reduction Treaty, or New START, governing longer-range systems.

United States could deploy to Europe or Asia in the near term. The U.S. military has not developed any land-based missiles within the prohibited ranges for decades and has only just started funding a new ground-launched cruise missile to match the 9M729.

27th Fusion Energy Conference held in Gandhinagar, Gujarat

- The International Atomic Energy Agency (IAEA) fosters the exchange of scientific and technical results in nuclear fusion research and development through its series of Fusion Energy Conferences.
- The 27th IAEA Fusion Energy Conference (FEC 2018) aims to provide a forum for the discussion of key physics and technology issues as well as innovative concepts of direct relevance to the use of nuclear fusion as a source of energy.
- With the participation of international organizations such as the ITER Organization and the European Atomic Energy Community (Euratom), as well as the collaboration of more than forty countries and several research institutes, including those working on smaller plasma devices, it is expected that this conference will, like previous conferences in the series, serve to identify possibilities and means for continuous and effective international collaboration in this area.
- The IAEA is the world's centre for cooperation in the nuclear field. It was set up as the world's "Atoms for Peace" organization in 1957 within the United Nations family. The Agency works with its Member States and multiple partners worldwide to promote the safe, secure and peaceful use of nuclear technologies.
- It seeks to promote the peaceful use of nuclear energy, and to inhibit its use for any military purpose, including nuclear weapons.
- IAEA reports to both the United Nations General Assembly and Security Council.
- The IAEA has its headquarters in Vienna, Austria.

What is Nuclear Fusion?

- Nuclear fusion is a reaction through which two or more light nuclei collide into each other to form a heavier nucleus. This reaction takes place with elements which have a low atomic number, such as Hydrogen.
- It is the opposite of nuclear fission reaction in which heavy elements diffuse and form lighter elements. Both nuclear fusion and fission produce a massive amount of energy.

Nuclear Fusion in the Universe:

- Every star in the universe, including the Sun, is alive due to nuclear fusion. It is through this process that they produce such mind-boggling amount of heat and energy.

- The pressure at the core of any star is tremendously high and that is where the nuclear fusion reaction fusion takes place. For example, the temperature at the core of the sun is around 15 million degrees Celsius.
- At this temperature coupled with a very high pressure, two isotopes of Hydrogen, Deuterium and Tritium, fuse to form Helium and releases the massive amount of energy in the form of heat. Around 600 million tons of hydrogen is converted into Helium every second in the Sun.

Applications of Nuclear Fusion

- We are still at an experimental stage as far as nuclear fusion reactions are concerned.
- Clean: No combustion occurs in nuclear power (fission or fusion), so there is no air pollution.
- Less nuclear waste: Fusion reactors will not produce high-level nuclear wastes like their fission counterparts, so disposal will be less of a problem. In addition, the wastes will not be of weapons-grade nuclear materials as is the case in fission reactors.
- If utilized properly, nuclear fusion is the answer to the world's power crisis problem. It is clean and produces a minimal amount of nuclear waste as compared to fission reactions. The fuel for fusion, Deuterium, and Tritium, are also readily available in nature. Scientists are hopeful that in the coming centuries, fusion will be a viable alternative power source.

The problem is that the process only produces net energy at very high temperatures of hundreds of millions of degrees – too hot for any solid material to withstand. To get around that, fusion researchers use magnetic fields to hold in place the hot plasma, a gaseous soup of subatomic particles that fuels the process, to stop it melting through the metal reactor.

The ultimate goal of fusion research, yet to be achieved, is creating a fusion reactor that produces more energy than it took to ignite and contain the process.

The challenge to create a source of energy similar to that of the sun itself in a reactor is yet to be conquered. With dedicated research and unprecedented international collaboration, scientists believe that there is light at the end of the tunnel to re-create this energy in a reactor that can deliver energy to the electricity grid.

This innovative experiment is to be carried out at a global nuclear fusion experiment facility presently under construction. Known as ITER and located in Cadarache, in the south of France; it is an international project with seven members: China, India, Japan, South Korea, the European Union, the Russian Federation and the United States.

Green Climate Fund approves \$1 billion to assist poor countries to tackle climate change

- Green Climate Fund, the UN-backed fund has approved more than \$1 billion for 19 new projects to help developing countries tackle climate change. The decision was taken during a four-day meeting in Manama, Bahrain.
- The officials overseeing the Climate Fund also agreed to start seeking fresh money next year as its initial capital of about \$6.6 billion will soon be used up.
- The green fund, considered a key vehicle for climate-related development programs, was originally meant to receive over \$10 billion from rich countries by 2018.
- However, US President Donald Trump's decision to withhold \$2 billion of the \$3 billion pledged by his predecessor, Barack Obama, has contributed to a shortfall in its projected assets.

Green Climate Fund

- The Green Climate Fund (GCF) was adopted as a financial mechanism of the UN Framework Convention on Climate Change (UNFCCC) at the end of 2011 in CoP 16.
- The GCF is intended to support projects, programmes, policies and other activities in developing country for combating climate change.
- The GCF finances activities to both enable and support adaptation, mitigation (including REDD+), technology development and transfer (including CCS), capacity-building and the preparation of national reports.
- The important distinction of GCF is that it has an independent legal status and personality and nationally designated authorities have a paramount role to play. This has been achieved after many rounds of different negotiations.
- The GCF follows a 'country-driven approach', which envisages effective involvement of various stakeholders at all levels and also enables the developing countries to evolve their climate policy keeping in consideration their immediate development priorities like poverty reduction and improving standards of living for a large proportion of their population. The effectiveness with which a country is able to tap the resources from the GCF and use them effectively is dependent on how well the country's government and its various institutions have prepared themselves to access the Fund.
- India has moved forward in this regard by selecting the Ministry of Environment, Forests and Climate Change as India's Nationally Designated Authority (NDA) for the GCF, which will recommend to the Board of the GCF funding proposals in the context of national climate strategies.

- Further NABARD has been accredited by Green Climate Fund (GCF) Board as one of the National Implementing Entity (NIE) for GCF in India.
- NABARD will be responsible for management and oversight of project implementation, which includes the origination and preparation of a funding proposal, the subsequent management of the necessary stages of the implementation process until its conclusion (project management) on behalf of GCF, and reporting obligations.
- It is based in South Korea and governed by a Board of 24 members and initially supported by a Secretariat.
- The World Bank serves as the interim trustee of the GCF, and the Fund functions under the guidance of and remains accountable to the UNFCCC Conference of Parties.
- The Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.

GCF approves \$43 million to boost climate resilience for India's coastal communities

GCF approves \$43 million to boost climate resilience for India's coastal communities

UN-backed fund Green Climate Fund (GCF) has approved US \$43.4 million for enhancing climate resilience for millions of people living in India's coastal communities as part of its efforts to combat extreme impacts of climate change. The grant is part of more than US \$1 billion approved by 21st meeting of GCF Board held in Bahrain's capital Manama for 19 new projects to help developing countries tackle climate change. This GCF funded multi-dimensional project in India will focus on selected vulnerable areas of Andhra Pradesh, Maharashtra and Odisha states.

PM inaugurates National Police Memorial in New Delhi

- Prime Minister Narendra Modi inaugurated and dedicated National Police Memorial (NPM) to nation in New Delhi on the occasion of National Police Commemoration Day (Observed on October 21).
- The memorial has been built on 6.12-acre land in central Delhi's Chanakyapuri area. It built a few years ago, has now been refurbished and central structure has been enhanced by replacing old rock structure. This memorial represents all State/UT Police Forces and Central Police Organisations of the country.
- Its design was conceptualised by Advaita Gadanayak of National Gallery of Modern Art (NGMA).

US-based Dalit writer Sujatha Gidla wins 2018 Shakti Bhatt Prize

US-based Dalit writer Sujatha Gidla (55) has won 2018 Shakti Bhatt First Book Prize for her debut book "Ants Among Elephants: An Untouchable Family and the Making of Modern India". Her book was shortlisted by award panel from of other six contestants.

Shakti Bhatt First Book Prize

The Shakti Bhatt First Book Prize is funded by the Shakti Bhatt Foundation. It was set up in 2008 in memory of young writer and editor Shakti Bhatti. It honours first-time writers from Indian sub-continent for their outstanding work of fiction or non-fiction. It carries cash prize of Rs. 2 lakh. Sri Lankan author Anuk Arudpragasam had won the prize in 2017 for his debut novel "The Story of a Brief Marriage" set in the backdrop of the civil war

China opens world's longest sea bridge linking Hong Kong, Macau and Zhuhai

China inaugurated Hong Kong-Zhuhai-Macau Bridge, world's longest sea bridge with total length of 55 km. The new sea bridge will connect the east and west sides of Pearl River Delta of the South China Sea, connecting two Special Administrative Regions of Hong Kong and Macau with Zhuhai i.e. mainland China.

Hong Kong-Zhuhai-Macau Bridge

It includes dual three-lane, overseas stretch (22.9 km) and undersea tunnel (6.7 km) which reaches depth of 44 m. The rest 25.4 km of the bridge runs over land. The two ends of tunnel of bridge are connected to two artificial islands, each million sq ft, constructed in shallow areas of Pearl River Estuary to allow transit between bridge and tunnel sections.

The project was initially conceived in 2003, and construction began on December 2009. Its total cost was 120 billion yuan (\$17.3 billion). This has been shared in different proportions by Hong Kong, Macau and Zhuhai governments. It is estimated that 29,000 vehicles would cross the bridge every day.

China considers this mega structure as key component of its plans to develop Greater Bay Area. This area will be business hub comprising Hong Kong, Macau and nine cities of Guangdong province (mainland China). This bay area is being developed with aim to rival New York (US) and Tokyo (Japan) in terms of technological innovation and economic success. This bridge will play vital role in facilitating creation of a single market by connecting.

The bridge will put three cities within hour's commute of each other and is expected to boost economic development. It will cut travel time from Hong Kong International Airport to Zhuhai from 4 hours to 45 minutes. It will also bring down trip between Kwai Chung Container Port (Hong Kong) and Zhuhai to 1 hour and 15 minutes from existing 3½ hours.

This bridge is considered as another move of China to assert more control over Hong Kong and Macau special administrative regions. Both provinces are former European colonies (Hong Kong was under British control and Macau was under Portuguese control), handed back to China in late 1990 and are run under “one country, two systems” principle, which allows them to retain their economic and democratic systems of government (multi-party system) independent of China for 50 years. Concerns of affecting ecology of area especially to White Chinese dolphin also have been raised. Safety concerns of bridge also have been raised after reports that artificial islands has drifted.

MISCELLANEOUS

Earth's inner core is solid, softer than thought: Study

Contrary to the fact the Earth's inner core is solid, researchers from Australian National University (ANU) have found that it is comparatively softer. In a groundbreaking discovery, Associate Professor Hrvoje Tkalcic and PhD Scholar Thanh-Son Pham are confident that the earth's inner core is solid.

Facts about the inner core of the Earth:

- Radius: 1,220 kilometres (760 miles) i.e. 70 per cent of the Moon's radius
- Composed of: Nickel-iron alloy
- Temperature: 5,700 K (5,430 °C) or 9806 °F, which is almost the temperature of Sun

What is inner core made of?

- The inner core is made up of two layers outer and inner.
- Outer core is 1,355 miles (2,180 km) thick.

Why is the radius of inner core unknown?

- There is no estimated radius of the inner core; however, it plays a distinct role in making Earth's magnetic field.
- The inner core is measured by shear waves, a seismology term, which is so tiny and feeble that it can't be observed directly.
- In fact, detecting them has been considered the 'Holy Grail' of global seismology since scientists first predicted the inner core was solid in the 1930s and 40s.

Purpose of the Earth's inner core:

According to space.com, when charged particles from the solar wind collide with air molecules above Earth's magnetic poles, it causes the air molecules to glow, causing the auroras - the northern and southern lights.

How has it been discovered?

- Researchers came up with a way to detect shear waves, or “J waves” in the inner core – a type of wave which can only travel through solid objects.
- According to the research published by the university, the wavefield method looks at the similarities between the signals at two receivers after a major earthquake, rather than the direct wave arrivals. The study shows these results can then be used to demonstrate the existence of J waves and infer the shear wave speed in the inner core.
- It has been found that the inner core shares some similar elastic properties with gold and platinum.

What is the significance of this method?

- The understanding of the Earth's inner core has direct consequences for the generation and maintenance of the geomagnetic field, and without that geomagnetic field there would be no life on the Earth's surface.

BILATERAL

India and Bangladesh sign agreements for enhancing inland and coastal waterways connectivity

- India and Bangladesh has signed three agreements, including one to use Chittagong and Mongla Ports in Bangladesh for goods movement and for enhancing inland and coastal waterways connectivity between the two countries.
- The two countries also signed a standard operating procedure (SOP) for movement of passenger and cruise services.
- An addendum to Protocol was also signed on Inland Water Transit and Trade (PIWTT) for inclusion of Dhubri in India and Pangaon in Bangladesh as new ports of call.
- The two countries had also arrived at an agreement to open a new route to land-locked Tripura by making Gomti and Haora rivers navigable for which dredging would be required in 20 kms on Indian side and 75-80 kms in Bangladesh side.
- Prior to the secretary-level talks, the 19th edition of the Standing Committee meeting under ‘Protocol on Inland Water Transit and Trade’ (PIWTT) between high-level delegations of the two countries were held

Benefits and significance:

- The new arrangement will facilitate the movement of fly ash, cement, construction materials from India to Bangladesh through IWT on Rupnarayanriver.
- The North Eastern states would get connected to directly to the ports of Kolkata and Haldia in India and Mongla in Bangladesh through waterways which would facilitate movement EXIM cargo and would also reduce the logistic costs.
- The reconstruction and opening up of Jangipur navigational lock on river Bhagirathi subject to the provisions of the Treaty between India and Bangladesh on Sharing of Ganga Waters at Farakka,1996. This move has the potential to reduce the distance to Assam by more than 450 kms on the protocol routes.

India, Afghanistan and Iran meet in Tehran in a bid to fast-track Chabahar port project

- Afghanistan, India and Iran met in Tehran to discuss the development of the Chabahar port, a sign that India is committed to the project despite the threat of looming US sanctions on the West Asian country.
- The Indian delegation to the first meeting of the Coordination Council on Chabahar was led by T.S. Tirumurti, secretary, economic relations
- Detailed discussions were held between three sides on full operationalisation of trilateral Agreement for international transit and transport through Chabahar port. They shared view that full operationalisation of Chabahar port will promote connectivity and economic development of Afghanistan and region. They also reviewed its implementation.
- They also decided to constitute follow-up committee that will hold its first meeting within two months in Chabahar port. This committee will discuss and aim to finalise protocol to harmonise transit, roads, customs and consular matters for making the route attractive and decrease logistic costs. It was also decided to hold next meeting of the coordination council in India in the first half of 2019.
- India is committed to Chabbar project despite threat of US sanctions on nations doing business with Iran including buying oil or investing in the country.

Chabahar port

It was in 2003 that India first proposed developing the Chabahar port seen as a gateway for the country to access the landlocked markets of Afghanistan and Central Asia given New Delhi's tense ties with Pakistan have blocked overland trade through Pakistan.



Chabahar is located less than 100 nautical miles from the Chinese built port of Gwadar in Pakistan. In February, India and Iran signed a pact to lease to New Delhi the contract for operation of the Shahid Beheshti port or phase 1 of Chabahar. Under the terms of the pact, India Ports Global Ltd (IPGL), an Indian company, is to take over the interim operations of the port at Chabahar and operate the terminal for 18 months. Under this project, India is not only get a port for trade but also a place from where Indian Navy can give befitting reply to China in case China decides to flex its navy muscles by stationing ships in Gwadar port to reckon its upper hand in the Indian Ocean, Persian Gulf and Middle East.

Costs of imports of products like iron ore, oil, sugar, and rice to India will be significantly lowered. A study commissioned by the Ministry of Commerce has found that cost of imports via Chabahar port along with INSTC is 30% cheaper than those via Mediterranean-Suez route.

Economic ties between India and Afghanistan which were in limbo due to political uncertainty will significantly improve once Chabahar is completely operationalized. India will link Chabahar port to Zaranj-Delaram highway in Afghanistan and is keen on developing a rail link there with the cooperation of Iran.

India will also be developing various industries(aluminum and urea plants) in the Chabahar Economic Zone.

Geo-strategic push

The consignment of wheat is the first of six shipments to be sent to Afghanistan over the next few months via Iran

- The Iranian port of Chabahar will be New Delhi's primary gateway to Afghanistan and Central Asia
- Chabahar will help ramp up trade between India, Afghanistan and Iran in the wake of Pakistan denying transit facilities

Internet of Things

Internet of Things (IoT) is the inter-linking of digital devices, machines, people and other objects etc with each other through wireless networks. It allows anything and everything to connect and communicate with each other. The basic idea behind IoT is that all the objects, people, and businesses etc. should be able to easily communicate with each other. The rapid development in the IoT is leading to the beginning of the next digital revolution. It has opened new frontiers in digital technology with multi-dimensional uses.

Example:-

One of the most highly visible and popular pieces of Internet of Things technology is the Nest, a smart thermostat that's connected to the internet. The Nest learns your family's routines and will automatically adjust the temperature based on when you're home or away, awake or asleep, hot or cold, to make your house more efficient and help you save on heating and cooling bills. The mobile app allows you to edit schedules, change the temperature when you're away from home, and even receive alerts when it looks like something has gone wrong with your heating or cooling system.

Who coined the term the Internet of Things?

In 1999 Kevin Ashton, then at P&G (later MIT's Auto-ID Center), coined the term 'Internet of Things'. It was a new term, but not a new operation. It was known as pervasive computing, ubicomp, and ambient intelligence.

Which devices can be part of IoT?

- Anything that can be connected, will be connected.
- Any device, if it has an on and off switch then chances are it can be a part of the IoT. Very often the connected devices will have an I.P address. With Internet Protocol Version 6 (IPv6), assigning an IP address to billions of devices has become very much feasible.

Examples of 'things' which can be connected to internet include:

- Connected Wearables – Smartwatches, Smart glasses, fitness bands etc.
- Connected Homes – connecting household appliances to the network.
- Connected Cars – vehicles that are connected to the internet.
- Connected Cities – smart meters which analyse usage of water, gas, electricity etc connect cities to IoT

Operationally this means that we can define the Internet of Things as the seamless flow between the –

- BAN (body area network): wearables,
- LAN (local area network): smart home,
- WAN (wide area network): connected car, and
- VWAN (very wide area network): the smart city.
- Key to this flow is having control of the data.

That is why Google is offering a Glass and a Lens so you can synchronize your health data into the NEST and the Google Car throughout the smart city applications of google.org. The idea is that in consumer applications and services you never have to leave the Google Cloud. The products are gateways linking up the networks.

Applications of Internet of Things

1. Day to day lives: There can be many IOT examples in our day to day lives. For example, a person returning home after his office hours can call his coffee-maker to make the coffee ready as soon as he reaches his home. One can use IoT to water the plants of his/her garden as soon as the moisture level falls below a certain level. We can use IoT to convert a normal home to smart home. It can be used in energy efficiency in homes and office places.
2. Industry: In manufacturing industries, IoT can be used to improve its performance, reduce human-induced errors and ultimately improve the overall quality of the manufactured products. It can also be used to develop good quality internet of things products etc. In IT sector it can lead to improvements in its services, development of more sophisticated digital software and digital services etc. In totality, its effects would vary from industry to industry.
3. Agriculture : IoT can be used to collect information about rainfall, soil moisture, nutrient content of the soil, pest infestation etc. It can help in talking informed decisions with app-based monitoring technologies to increase agricultural production and reduce associated risks of crop failures etc. It can promote smart techniques in agriculture and help in making it remunerative with better price-discovery for farmers.
4. Healthcare: In healthcare, Medical practitioners and doctors can use IoT to develop remote health monitoring systems to remotely monitor the patient's health. Doctors can use IoT in the Smart Beds to detect when the patient is trying to get up etc. With the help of IoT specialized sensors can be developed for senior citizens. Wearable heart monitors can be helpful to track the heartbeats, blood pressure of patients. It can truly revolutionise telemedicine applications.

5. Media: Corporate media houses can use IoT to detect consumer habits for behavioural targeting etc. This can help them to display consumer specific advertisements etc. They can use Big Data and Data Mining for this purpose.
6. Transportation: In the Driverless cars, we can use IoT to improve the intra-vehicular communication to reduce accidents and traffic jams etc. We can use it for electronic toll collections, Smart parking, Smart traffic management etc. IoT can be helpful in logistics and fleet management, safety assistance etc. As automation gains ground in automobile manufacturing and there are experiments with driverless cars, the IoT can immensely help in efficient management of these new practices.
7. Smart Cities: In Smart Cities, we can use IoT in solid waste management systems to improve the cleanliness of the city. We can use it in Smart energy management systems to develop Smart Power Grids which can improve energy efficiency and reduce transmission losses. We can use IoT to monitor the air pollution levels in the cities and give warning when it breaches prescribed safety levels. We can also use IoT to develop Smart transportation systems to reduce congestion in the cities.
8. Government policies and services: The central government is going to bring a regulatory framework for the promotion and protection of Internet of things (IoT). Department of Telecommunication is going to bring Machine to Machine (M2M) roadmap standards for the industry as well as for individual users.
9. The Union government has allowed 100 percent FDI in the telecom sector. This is expected to help in the development and growth of the Internet of Things (IoT). Department of electronics and information technology (DeITY) has brought a draft policy for IoT. Its target is to create a market of USD 15 billion by 2020 for IoT and having a share of 5-6 percent in the global IoT industry. The supportive ecosystem can really work wonders for this emerging sector.

IoT offers many other benefits industrially, such as:

- Unprecedented connectivity: IoT data and insights from connected applications and devices empower organizations with the ability to deliver innovative new products and services faster than their competitors.
- Increased efficiency: IoT networks of smart and intelligent devices provide real-time data to arm employees with the information they need to optimize their day-to-day efficiency and productivity.
- Cost savings: IoT devices provide accurate data collection and automated workflows to help organizations reduce their operating costs and minimize errors.
- Time savings: Connected smart devices can help organizations enhance the performance of systems and processes to save time.

IoT security and privacy issues

- The internet of things connects billions of devices to the internet and involves the use of billions of data points, all of which need to be secured. Due to its expanded attack surface, IoT security and IoT privacy are cited as major concerns.
- One of the most notorious recent IoT attacks was Mirai, a botnet that infiltrated domain name server provider Dyn and took down many websites for an extended period of time in one of the biggest distributed denial-of-service (DDoS) attacks ever seen. Attackers gained access to the network by exploiting poorly secured IoT devices.
- Because IoT devices are closely connected, all a hacker has to do is exploit one vulnerability to manipulate all the data, rendering it unusable. And manufacturers that don't update their devices regularly -- or at all -- leave them vulnerable to cybercriminals.
- Additionally, connected devices often ask users to input their personal information, including names, ages, addresses, phone numbers and even social media accounts -- information that's invaluable to hackers.
- However, hackers aren't the only threat to the internet of things; privacy is another major concern for IoT users. For instance, companies that make and distribute consumer IoT devices could use those devices to obtain and sell users' personal data.
- Beyond leaking personal data, IoT poses a risk to critical infrastructure, including electricity, transportation and financial services.

The future of IoT

- There is no shortage of IoT market estimations. For example:
- Bain & Company expects annual IoT revenue of hardware and software to exceed \$450 billion by 2020.
- McKinsey & Company estimates IoT will have an \$11.1 trillion impact by 2025.
- IHS Markit believes the number of connected IoT devices will increase 12% annually to reach 125 billion in 2030.
- Gartner assesses that 20.8 billion connected things will be in use by 2020, with total spend on IoT devices and services to reach \$3.7 trillion in 2018.