EpIC NEWSLETTER

Technological Innovations in Independent India

ENTREPRENEURS AND INNOVATORS CLUB (EPIC)

DIRECTORATE OF INNOVATION, PROJECTS AND CONSULTANCY

SAM HIGGINBOTTOM UNIVERSITY OF AGRICULTURE,

TECHNOLOGY AND SCIENCES, ALLAHABAD

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Characteristics of Innovative Universities

In order for any country to progress ahead and establish their footprint at global level, the youth of the country is to be nurtured in the right direction and at the right time. A student is exposed to the outside competitive world in his or her college days. Therefore, universities and institution of the country play a major role in developing the culture of innovation and entrepreneurship.

After Graduation the students are unable to find good and quality jobs related to their fields. More than that Colleges and Universities face competition from distance learning schools/courses and students who attend institutions of higher learning that have adopted innovation are more likely to be competitive in the job market. Here are five signs of innovative universities that helps students in building their career.

1. Keeping an eye on the current job market:

A truly innovative university holds a good Industry-Academia relationship because they know the current and future aspects of jobs in the market. University offers coursework that prepares students for jobs in the current market while giving students credit for experiences they gain working with partner companies.

2. Collaborating with reputed National and International Institutes:

Innovative universities go outside the boundaries of their institution to conduct research, perform service and participate in other types of collaboration internationally, thus preparing students for their future in a global community and proving themselves as valuable resources for the world. A quality collaboration represents the future of education.

3. Adopting latest technology:

An innovative university offers the training and resources for making everyone comfortable using available technology and trains its students to be lifelong learners when it comes to new developments. Faculty uses latest technology to improve the learning skills of the students as well.

4.Not afraid to imitate what's in trend:

Innovative universities are not afraid to copy what makes other successful institutions succeed, whether they are their competitors or examples from the business world.Sometimes only focusing on your own innovation niche leads to fall behind your peers and taking inspiration from others keeps you on the cutting edge.

5. Understanding the needs and aspiration of the students:

Innovative universities know that a four-year program of study immediately following high school graduation does not work with modern students' lives and goals. Some students wants flexibility with admissions criteria, enrollment procedures, how courses are held and how credit is given. So the University help students to gain skills they need in the workplace and the confidence to create their own knowledge more than learning to regurgitate facts from textbooks and lectures.

Er. Varun Paul
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"Technical Salt"

The beauty of technology lies in its versatility and simplicity. If we take time to stop and look around, you would notice that technology is intertwined with our daily life, even with our table salt!

Salt is our staple seasoning. This mineral has stood the test of time, even being the focus of protest in the Indian Independence struggle. While Gandhi used salt as a power symbol during the salt satyagraha movement, Technology now uses it as a vehicle to provide optimal health.

Fortification is the process of fortifying or enriching food with specific vitamins or minerals. Salt is an excellent tool in fortification as it is used by everyone at every meal, every day. It is primarily fortified with Iodine to prevent Iodine deficiency disorders. Double-fortified salt (DFS) is salt fortified with both Iodine and Iron (to prevent anemia). Public health policies worldwide have mandated iodization of salt in their countries.

Iodine is an essential trace mineral required by the body for growth and development. Its deficiency is the leading cause of mental retardation in infants. The vulnerable populations - children, young women, and pregnant women are at risk of the deficiency disorders of Iodine such as goiter, cretinism, hypothyroidism etc. Technology has made it possible to deliver this essential nutrient to populations at large. Its role is seen in the production of salt in salt farms and salt industries, in iodine food fortification process, in the production of iodine supplements and also in detection of iodine levels in salt samples by using instant detector kits. A recent development was in the area of wearable technology where an entrepreneur developed "Iodine Bindis". By wearing the traditional "Bindis" women rural women of India could get the required amounts daily and fight Iodine deficiency without much effort. However this concept is controversial. With Universal salt iodization, awareness programmes and innovative technology by the public health sectors, Currently, Iodine deficiency disorders, though a reality in India is no longer a threat to the country.

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Science and Technology Development in India.

Introduction

India ranks third among the most attractive investment destinations for technology transactions in the world. Dr Harsh Vardhan, Union Minister of Department of Science & Technology, has reiterated that technology is a strong priority area for the government and it aims to make people science-centric. Modern India has had a strong focus on science and technology, realising that it is a key element of economic growth. India is among the topmost countries in the world in the field of scientific research, positioned as one of the top five nations in the field of space exploration. The country has regularly undertaken space missions, including missions to the moon and the famed Polar Satellite Launch Vehicle (PSLV).

Currently, 27 satellites including 11 that facilitate the communication network to the country are operational, establishing India's progress in the space technology domain. India is likely to take a leading role in launching satellites for the SAARC nations, generating revenue by offering its space facilities for use in other countries.

Market Size.

India ranks second in terms of contribution to high-quality scientific research. It is among the world's top 10 nations in the number of scientific publications. Position-wise, it is ranked 17th in the number of citations received and 34th in the number of citations per paper across the field of science and technology (among nations publishing 50,000 or more papers). The country is ranked ninth globally in the number of scientific publications and 12th in the number of patents filed.

India has been ranked as the top exporter of information and communication technology (ICT) services and second in innovation quality in 2017. The country has moved up six places to 60th position in the Global Innovation Index (GII).

Innovation centres are quickly being set up in India by organisations around the world, backed by the Government of India's move towards a digital economy and plenty of digital talent.

The Government of India is extensively promoting research parks technology business incubators (TBIs) and (RPs) which would promote the innovative ideas until they become commercial ventures.

India's Engineering R&D (ER&D) Globalization and Services market reached US$ 22.3 billion in 2016 and is set to rise to US$ 38 billion by 2020. India has a total of 25 innovation centres in the country and has been ranked as the top innovation destination in Asia and second in the world for new innovation centres, according to a Capgemini report. The country accounts for 27 per cent of Asia's new innovation centres.

Developments/ Investment

With support from the government, considerable investment and development have incurred in different sectors such as agriculture, healthcare, space research, and nuclear power through scientific research. For instance, India is gradually becoming self-reliant in nuclear technology. Recently, the Kudankulam Nuclear Power Project Unit-1 (KKNPP 1) with 1,000 MW capacities was commissioned, while the Kudankulam Nuclear Power Project Unit-2 (KKNPP-2) with 1,000 MW capacities is under commissioning.

Recent Development.

Some of the recent developments in the field of science and technology in India are as follows:

• As per the Government records, the number of Indian scientists coming back to India to pursue research opportunities has increased from 243 in 2007-2012 to 649 between 2012 and 2017. In the span of 5 years, 649 Indian scientists have returned to pursue research opportunities.

• India's space business to witness tremendous growth in the next five years, on the back of technology advancement, global space business opportunity and a sharp rise in Indian Space Research Organisation's (ISRO) satellite launch capability.

Investment Scenario

• Higher Education Funding Agency (HEFA) has approved projects US$ 320.89 million, of six institutions, which will be used to improve the research infrastructure in these institutions.

• Spending on artificial intelligence (AI) by Indian companies is expected to increase by 8-11 per cent over the coming 18 months backed by the rising influence of AI-based solutions across verticals.

• The state of Karnataka aims to become the electric vehicle (EV) capital of India with investments worth Rs 31,000 crore.

• India has successfully launched the GSAT-17 satellite, which carries communication payloads in C-band, Extended C-band and S-band to provide various services to the country.

Government Initiative.

• A five-year technology fund with US$ 4 million yearly investment, called Israel India Innovation Initiative Fund (I4F), has been launched by India and Israel to boost bilateral ties.

• Mr Nitin Gadkari, Minister for Road Transport, Highways and Shipping, Government of India, is planning to introduce biofuel vehicles for road and water transportation on a large scale and has already directed Niti Aayog to conduct a research on methanol-powered vessels like cars and ships developed by China.

• The Department of Science and Technology (DST), Government of India has launched a scheme named 'Visiting Advanced Joint Research Faculty' (VAJRA), in a bid to bring together the Indian scientists abroad and India-based researchers for conducting joint researches in India.

• The Government of India aims to develop India into a global innovation hub by 2020 on the back of effective government measures taken to provide an enabling environment for growing research and development in India, says Mr Y. S. Chowdary, Minister of State for Science and Technology & Earth Sciences, Government of India.

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The Union Budget 2018-2019

• The allocation to the Department of Science and Technology has been increased by 8.21 per cent to Rs 5,114.78 crore as against the previous budget.

• The budget for the Ministry of Science and Technology has been increased by 6.11 per cent to Rs 12,322.28 crore (US$ 1.9 billion) as against the previous budget.
• The Department of Atomic Energy has been allocated Rs 13,971.41 crore (US$ 2.16 billion), an increase of 5.76 per cent against the previous budget.
• The Ministry of Earth Sciences was allocated Rs 1,800 crore (US$ 278.04 million), which is an increase of 12.66 per cent as against the previous budget.

The Road Ahead

India is aggressively working towards establishing itself as a leader in industrialisation and technological development. Significant developments in the nuclear energy sector are likely as India looks to expand its nuclear capacity. Moreover, nanotechnology is expected to transform the Indian pharmaceutical industry. The agriculture sector is also likely to undergo a major revamp, with the government investing heavily in the technology-driven Green Revolution. The government of India, through the Science, Technology and Innovation (STI) Policy-2013, among other things, aspires to position India among the world's top five scientific powers. 'Chandrayaan-II', India's space mission to moon, is set to take place between January-March 2018, stated Dr Jitendra Singh, Union Minister of State (Independent Charge), Ministry of Development of North Eastern Region (DoNER), MoS PMO, Personnel, Public Grievances & Pensions, Atomic Energy and Space, Government of India.

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Some technological innovations start-ups that are revolutionizing Indian agriculture

As per estimates by the Central Statics Office, the share of agricultural products/agriculture and allied sectors in the country's Gross Domestic Product (GDP), which was 51.9 percent in 1950-51, has come down to 13.7 percent in 2012-13. That contribution is abysmally low for a sector that employs about 50 percent of the country's population. However, this is mainly due to the farmers' inability to generate income from their crops and curb their growing debt.

What can we do about it? Some start-ups came up with an innovative answer to that question. Here are ten notable innovations such companies have produced:

1.Barrix Ago Sciences

The Bangalore-based start-up offers eco-friendly crop protection methods after much research on products that support organic farming to increase crop produce and quality with minimal expenditure.

Products:

Barrix Catch Fruit and Fly Lure + trap: Toxic pesticides contaminate water, soil and leave behind harmful residue, besides being expensive. Barrix's pheromone-based pest control traps have artificially synthesized smelling agents that attract and traps pests. Instead of eating the crops, the pests are attracted to the pheromones in the traps.

Fly pest sticky sheet: Barrix uses bright yellow and blue colored recyclable sheets of wavelengths between 500 nm to 600 nm, proven to effectively attract and trap at least 19 high-risk pests from a long distance.

2. Anulekh Agrotech

Set up by Mumbai-based entrepreneurs, Anulekh focuses on increasing soil fertility to achieve higher agricultural productivity and crop yield with lower resource use.

Product:

BIOSAT: BIOSAT (Biochar based organic Soil Amendment Technology), a soil additive, is made of biochar mixed with different organic nutrients. The product preserves soil fertility, traps carbon emissions, maintains the topsoil strength and increases crop production, thus reducing dependency on chemical fertilizers.

3.Mitra

A Nashik-based start-up, MITRA (Machines, Information, Technology, Resources for Agriculture) aims to improve mechanization at horticulture farms with the use of R&D and high-quality farm equipment.

Products:

Air blast sprayers: Developed for fruits and vegetables in general, and grapes and pomegranates in particular, the sprayers, used to add hormones that help the growth of crops, reduce the expenditure on manual labour and are less time-consuming.

4.CropIn Technology Solutions

A farming technology solutions start-up founded by a Bangalore software engineer, it provides agri businesses the technology and expertise to create a smarter and safer food supply for consumers around the world.

Product:

CropIn offers information on a cloud-based platform, integrated with a mobile app for Android. Called Smart Farms, it allows large food companies to track the growth of crops on farms around the country with details about what the crop is and the conditions it is grown in to help companies remotely monitor farms, interact with farmers and make every crop transparent and traceable. It also aids farmers in adopting global agricultural practices and improves productivity by offering productivity insights and harvest forecasts.

5.Eruvaka Technologies

An organization based in Vijayawada, Andhra Pradesh, its mission is to accelerate the use of technology in aquaculture, an area where farmers face problems due to unavailability of adequate technology to measure and control water health.

Product:

Eruvaka Technologies, to help farmers monitor aquaculture ponds, develops solar-powered floating buoys that measure different water parameters, such as oxygen levels, temperature and pH range, crucial for the growth and survival of fish and shrimp. The collected information is uploaded to the cloud and transmitted to individual customers through an Android app, SMS, voice call or the internet. Farmers can also remotely control automated equipment such as aerators and feeders.

6.Skymet

Skymet is India's largest weather monitoring and agri-risk Solutions Company. According to their website, they are the experts in measuring, predicting, and limiting climate risk to agriculture, thus reducing losses incurred due to bad weather conditions.

Product:

Launched to aid farmers, Skymet's weather website offers services such as weather forecast, crop insurance,and agri-risk management. Prediction of weather conditions can help prepare farmers for a drought or heavy unseasonal rainfall and help them take appropriate preventive measures, they say and claim to accurately measure and predict yield at the village level for any crop.

7.Ekgaon

A Gujarat-based venture started in 2001, Ekgaon Technologies is an IT-based network integrator that provides a technology platform and offers a range of services to farmers in rural areas including financial, agricultural inputs and government assistance.

Products:

Financial: A mobile phone enabled financial services delivery platform, it provides information on microfinance institutions and banks for delivery of door-step services such as credit, savings, remittance, insurance, investment,and mortgage.

Agricultural: Offered in Hindi, Gujarati and Tamil languages, the system uses mobile, voice recognition, interactive voice response system (IVRS) and web technologies to provide information on weather, commodity market prices, soil nutrient management and crop management.
Citizen: The web and mobile applications help citizens monitor the delivery of government programmes and services entitled to them.

8.Digital Green

Digital Green is a not-for-profit international development organization that focuses on training farmers to make and shows short videos where they record their problems, share solutions and highlight success stories as community engagement to improve lives of rural communities across South Asia and Sub-Saharan Africa.

Products:
It uses technology-enabled behavior change communication that is cost-effective, scalable and brings together researchers, development practitioners, and rural communities to produce and share locally relevant information through videos.
Two social online games Wonder Village and Farmer Book: In the games, players simulate a village economy and relate with actual farmers that Digital Green works with, on the field. The players are placed in a resource-constrained setting in which they have to complete quests such as set up paddy and maize farms and supply raw materials to the farmers' markets.

9. FrontalRain Technologies

Product:
The company's offering Rain+, according to their website, is a comprehensive suite of products in the cloud for food and agribusinesses. Rain+ can help companies at every stage of the value chain starting from growing, processing, logistics, wholesale trade, retail trade,and exports. This technology, accessible through desktop, tablet, and mobile devices is used by companies dealing with commodities like spices, herbs, basmati rice, seeds, animal feed, seafood, dairy and edible oil.

10. Agrostar

A Pune-based 'direct to farmer' m-commerce platform, Agrostar strives to provide quality agro-inputs at the farmers' doorstep.
Product:
AgroStar enables farmers to procure a range of agricultural goods such as seeds, crop nutrition, crop protection and agri-hardware products by simply giving a missed call on the company's 1800 number or through their mobile app to eliminate unavailability of products, substandard products, duplication,and adulteration.

References- Media reports, barrix.in, anulekh.com, eruvaka.com, Wikipedia, skymetweather.com

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Interesting Facts about Mars Orbital Mission (MOM).

After a 300 days journey in deep space, on September 24, 2014, India's Mars Orbiter Spacecraft successfully entered into an elliptical orbit around planet Mars by firing its 440 Newton Liquid Apogee Motor along with eight smaller liquid engines.

With successful Mars Orbit Insertion, ISRO became the fourth space agency to successfully send a spacecraft to Mars orbit and India became the first country in the world to do so in its first attempt.
Also referred to as Mangalyaan, the Mars Orbiter Mission is world's cheapest interplanetary mission with a total cost of Rupees 450 crores.
At 450 crores of the total cost, the expense each Indian had to bear is less than Rs. 4.00!
First interplanetary mission realized by India and the first Indian spacecraft to incorporate full-scaleonboard autonomy to overcome the long distances and the communication gaps due to non-visibility periods.

First Mars mission in the world to succeed Mars Orbit Insertion in the first attempt.

First Indian spacecraft to successfully survive Van Allen belt crossing 39 times. First Indian spacecraft to escape the Sphere Of Influence of Earth and orbit Sun.

Most economical interplanetary mission in the world and paved way for cost-effective access to deep space.

Indian Space Research Organization (ISRO) - Mars Orbiter Mission (MOM) team won the US-based National Space Society's "Space Pioneer Award" for science and engineering category for the year 2015.

The Indira Gandhi Prize for Peace, Disarmament,and Development is awarded to ISRO in recognition of its path-breaking achievement, culminating in Mars Orbiter Mission, its significant contribution in strengthening international cooperation in peaceful use of outer space.

The spacecraft is laden with methane sensors. Methane is a key chemical for determining life process. This means that if the spacecraft manages to detect methane in Martian atmosphere, it will prove the presence of most elementary form of life on the planet.

Source: eoi.gov.in, factslegend.org, Wikipedia.

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TECHNOLOGICAL INNOVATIONS IN INDEPENDENT INDIA

The Government moved from scientific policy resolution (1958) to the technology policy statement (1983) to the science and technology policy (2003) and finally to the science, technology and innovation policy (2013). These are a number of innovationsand discoveries made by the well-known Indian scientists and people in the fields of science and technology, military and defence, nuclear energy, railways, and space research.

Science and Technology:

Birth of IIT's (1951): The minister of education MaulanaAbulKalam Azad, inaugurated the Indian Institute of Technology at Kharagpur in West Bengal which was modeled after the Massachusetts Institute of Technology.

Green Revolution India (1961): India started its own green revolution byadopting modern methods of agriculture such as plant breeding, irrigation development, and financing of agrochemicalsto replace the older methods in order to save the country from mass famine.

Synthesis of Artificial Gene (1970): HarGobindKhorana, an Indian-American biochemist, became the first to synthesize an artificial gene in a living cell. His work became the foundation for much of the later research in biotechnology and gene therapy.

White Revolution (1970): VergheseKurien also known as, the 'Father of the White Revolution' in India, launched the project, 'Operation Flood', the world's largest agricultural dairy development programme (also known as "billion-litre idea") made dairy farming India's largest self-sustaining industry and the largest rural employment provider. The project was launched under India's National Dairy Development Board (NDDB), which was the world's biggest dairy development program.

Pseudomonas putida (1971): Ananda Mohan Chakrabarty, an Indian inventor, andmicrobiologistcreated a species of a man-mademicroorganism to break down crude oil. He genetically engineered a new species of Pseudomonas bacteria ("the oil-eating bacteria").
United States Supreme Court granted his invention patent even though it was a living species.

World's second IVF baby(1978): SubhashMukhopadhyay, a Bengali physician, performed India's first and the world's second IVF (In vitro fertilization) baby which later resulted in the birth of baby Durga.

Good Knite's Mosquito Repellant (1984): India's first free mosquito repellant.

The Kalam-Raju Stent (1998): Dr. A.P.J. Abdul Kalam,along with cardiologist Dr. Soma Raju, developed a low-cost Coronary stent which was named as "Kalam-Raju Stent" honouring them.
Crescograph: a device invented in the early 20th century by Sir Jagadish Chandra Bose, a Bengali scientist, which was used to measure growth in plants.

Nuclear Energy

Apsara Nuclear Reactor (1954): On 4thAugust 1954, India's first large-scale Atomic Energy Nuclear Reactor and first in the East World, was commissioned in Bombay. It is the older of India's first nuclear research reactors designed by the Bhabha Atomic Research Centre(BARC) and built with assistance from the United Kingdom, which also provided India with the fuel supply consisting of 80 percent enriched uranium.

Missile Technology Control Regime (MTCR)(2008): India signed a key civil nuclear deal with the US, gaining access to some nuclear materials and technology. More to come in the future Indian scenario.

Nuclear Agreements (2016): India signs civil nuclear agreements with 14 countries: Argentina, Australia, Canada, Czech Republic, France, Japan, Kazakhstan, Mongolia, Namibia, Russia, South Korea, the United Kingdom, the United States, and Vietnam.

Railways

Indian Railways zonal creation (1949-1950):Indian railways take the majority of control over railway franchises after the partition and British departure.
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Electrification of Trains (1980): Around 4,500km of the track was electrified between 1980 and 1990.

India's First Metro station (1984): India's first metro system opened in Calcutta.

India's fastest train (2016): the Gatimaan Express, with a top speed of 160km/h, made its maiden journey from Delhi to Agra on 5 April 2016.
The future of Indian Railways (2018):Indian Railway is the fourth-largest rail network in the world, with tracks spanning more than 120,000 km of the country.

Military and Defence

Integrated Automatic Aviation Meteorological System:The Indian Navy inaugurated the Integrated Automatic Aviation Meteorological System (IAAMS) at INS Garuda and INS Parunduto modernizethe Meteorological infrastructure of 9 Naval Air Stations (NAS) by bringing accuracy in weather monitoring mechanism in the Indian Navy.

Indo-Israel Negotiation(1962): PM Jawaharlal Nehru writes to Israeli PM Ben Gurion seeking arms and ammunition supply during the war with China. Israel responds, making it the basis for defence ties between the two countries.

Prithvi missile (1988): It is a tactical surface-to-surface short-range ballistic missile (SRBM) developed by DRDO of India under the Integrated Guided Missile Development Program (IGMDP). It is deployed by India's Strategic Forces Command.

Joint Venture BrahMOS Project (1998): Dr. A. Sivathanu Pillai, an Indian scientist and currently, an Honorary Distinguished Professor at ISRO, developed the concept of the joint venture BrahMOS, is a joint venture project signed between India and Russia (with the US as an initial contributor) and is the fastest cruise missile in the world at present. This made India one of the few countries to develop its own missiles as well as supply missiles in other major areas of the world.

Agni-I Missile (2002): is a short-range ballistic missile used by the Indian army which was developed by DRDO of India under the Integrated Guided Missile Development Program after the Kargil War.

Tejas (2001): Dr. KotiHarinarayana, the person behind India's first built combat aircraft designed Tejas. It saw first flight in 2001. It is India's country's first self-made light combat aircraft built by HAL and developed by Dr. Koti which replacedthe outdated Russian aircraft, Mig-21 fighter jets.

INS Karanj Launched (2018): The Navy's third state-of-the-art Scorpene class submarine, INS Karanj, was launched in Mumbai which is named after the earlier Kalvari class INS Karanj, which was decommissioned in 2003.

OPV Vijaya Launched (2018): built by the Larsen and Toubro Shipyard near Chennai, is the second offshore patrol vessel (OPV) for the Indian Coast Guard.

ISRO Projects and Space Missions

Aryabhatta (1975): India's first satellite and has been named after the famous astronomer and a designed in the Indian subcontinent itself, thus, leading to a breakthrough in space missions.

SLV-III Satellite Launch (1980): successfully launched satellite Rohini to orbit on July 1980 under the direction of our former president Dr. A.P.J. Abdul Kalam after he joined the Defence Research and Development Organization (DRDO). It is India's first indigenous satellite launch vehicle.

Missile Programme (1980): In the 1980s Dr. Kalam led India's missile programme. Under his leadership, India became a major military power after the successes of Agni and Prithvi.

Indian National Satellite System (INSAT), 1983: a series of nine working satellites in a group, serving as multi-purpose geostationary satelliteswhich helped India with telecommunications, broadcasting, meteorology, search and rescue operations, built across the Asia Pacific region.

Space Capsule Recovery Experiment (SRE-1), 2007: On January 10, 2007, an Indian experiment spacecraft was launched using the PSLV C7 rocket from Sriharikota. It was launched along with three other satellites to display the ability to recover an orbiting space capsule and to test other things such as Thermal Protection System, management of communication blackout, navigation, guidance,and control, etc. The capsule stayed in the orbit for 12 days before re-entering the atmosphere of the earth and diving into the Bay of Bengal.

Chandrayaan 1, 2008: 312 days ofunmanned lunar mission was launched which was India's first mission to the moon. India is one of the only six space organizations to attempt this. The aim of the mission revolved around understanding the entire topography and chemical characteristics. The country's national flag was proudly hoisted on the moon.

Mangalyaan or MOM (2014): India became the first country to successfully reach Mars in its first attempt. ISRO also became one of the only four space organizations to have reached the red planet, apart from NASA, Soviet Space Programme,and the European Space Programme. Mars Orbiter Mission or MOM had a budget of just Rs. 450 crore, making this Mars mission the least expensive till now. The goal of the mission was to collect more data on the atmosphere of the planet.

GLSV MK3, 2014: It is an Indian made crew capsule launched by ISRO which is capable of carrying three astronauts to space. India will become a part of the exclusive group of space cruising nations which can take humans to space. It is one of the heaviest rockets which can carry 4 tonnes of load. ISRO's next level of this operation is to launch GSLV MK4, which would be able to carry 6 tonnes.

Heaviest Commercial Mission, 2015: ISRO launched 1440 kg of load. Five British satellites were launched as part of the mission using Polar Satellite Launch Vehicle-C28 on July 10, 2015. This commercial installation mission was launched from Sriharikota and included three optical earth observation satellites of 447 kg each along with two auxiliary satellites.

Created a world record by launching 104 satellites in a single mission(2017): On February 15, 2017, ISRO created history by launching 104 satellites using the Polar Satellite Launch Vehicle (PSLV), an Indian rocket. The scientists successfully managed to put these satellites into their desired orbit in one go.

World's smallest satellite: Rifath Sharook, an 18-year-old lad designs the world's smallest 3D-printed satellite, Kalamsat, after former President Abdul Kalam, and was flown by NASA into space in one of its missions.

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We salute all the known as well as lesser known individuals, who made everything possible for this nation to achieve global power and leadership. We are also thankful to the all governments who funded the above activities and made progressive policies to support them. We hope and continue to pray that this nation brings peace and security, youth empowerment, globally influenced Indian leaders, and the importance of the tricolour in each and every citizen of India. JAI HIND!

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This Indian Startup's 'Plastic' Bags Are 100% Edible & Biodegradable

Entrepreneur Ashwath Hegde, a Qatar-based NRI hailing from Mangalore, has come up with an eco-friendly alternative to plastic bags. And it's so good he's eaten it. Yes, Hegde's bags are edible and will not cause harm to animals if ingested- so no more wincing every time you see goats, dogs, and cows munching on bags. The name of this much-needed creation is Envigreen.

EnviGreen carrier bags, which look surprisingly like plastic bags, are made of materials like natural starch and vegetable oil derivatives. The bags are designed to dissolve in a glass of water at room temperature within a day, and boiling water within fifteen seconds. Even if these bags are chucked out on the street they will naturally degrade in less than 180 days.

Now at this point, if you're muttering, "this is too good to be true," kick your inner pessimist in the gonads and read on. The Karnataka State Pollution Control Board (KSPCB) approved the use of EnviGreen bags after conducting various tests on the naturally made product. As stated by a member of Hegde's team to the Times of India, "The bags have been boiled and burnt and been tested for strength. All the organizations have given them a green signal."

Speaking to The Better India, Hegde explained that the manufacturing process for EnviGreen bags is entirely different from that of plastic, cloth, or paper bags; "we don't use any chemicals at all. Even the paint used for printing on the bags is natural and organic." Hegde's patented bags are made up of twelve ingredients, including potato, tapioca, corn, and natural starch, and vegetable oil, banana, and flower oil. Moreover, Hegde has developed the bag to be a reasonably priced, natural solution, "to give you a rough idea, an EnviGreen bag measuring 13 inches by 16 inches costs Rs. 3, while a plastic bag with the same dimensions will cost Rs. 2."

Bhuwan Prasad Shah
B.Tech Agriculture
Semester: 3
ID: 17BTAG139

Technological Innovations in Independent India

Way back exact 71 years ago, On 15th August 1947, The life which we are living now, for them was merely a dream of heaven.
Those dark fights, immense sacrifices, many sleepless nights, only for our freedom right.
How can we let these go waste because it's not that what we inherited?
Now if you are asking about India's Technological Innovation, So, may I start with India's great revolutions?
M.S. Swaminathan, the man who doesn't need any explanations, his Green Revolution saves us from the curse of starvation.
Green Revolution is not an end to make our life sustain, it gives the tracktoo many more revolutions: Gold, Yellow, White, Blue, Pink, Red these are the solutions to cope the scarcity of our basic needs, until then we survive like living a life same as weeds.
How can we let our freedom fighter's sacrifices go waste just because it's not that what we inherited?
Whether it is Bhakra dam, whether it is the founder of Bhabha Atomic Research Centre. The legendary man Dr.HomiJehagirBhabha.
Whether becoming the 3rd largest technical qualified workforce, whether having the world's largest gene bank on our own.
Whether it is Prithvi, Nag in the field of defense, whether it is India's 1st Supercomputer (PARAM).
Whether it is Fiber optics, whether it is the launch of Intel Pentium chip, whether it is Chandrayan-1 India's 1st moon probe, that's what really matters.
Whether it is USB interface, whether it is a platform that Microwave communication had taken.
Whether it is India's 1st indigenously build Combat aircraft, whether it is empowering student with Akash tablet. That's Inventions that are still not in the eye in many of us:
Whether it is making possible with India's first IVF baby, whether it is the creation of indigenously developed missile system in our navy.
Whether it is 1st Mars orbit mission, whether it is India's 1st satellite launched with a version.
Whether it is having the vaccine to Combat Hepatitis C, whether it is giving lens and vision to cataract patient at affordable fees.
Whether it is a revolutionary cancer molecular inhibitor, whether it is a non-invasive heart condition detector.
Whether it is water purification at nano-scale level, whether it is water purification with the help of solar panel.
All these innovations make me feel proud to describe all our achievements in the field of technological innovation.
And this makes all of us sure that we really didn't let our freedom fighters' sacrifices go waste because it's not that what we inherited.

VivekKeshari
B.Tech Biotechnology (16BTBIOT012)

हैदराबाद में नेकनामपुर झील में दूर से देखने पर ऐसा लगता है कि जल-कुंभी ने पूरी झील को घेर लिया है लेकिन करीब जाने पर पता चलता है कि यह धीरे धीरे तैरता एक कृत्रिम द्वीप है। जो सावधानी से चुनी गई पौधों की प्रजातियों जैसे खस, देवकली, बाजरा, सरकंडा, सिट्रोनेला घास, गुड़हल,फव्वारा घास, फुल, जडी. बुटी तुलसी और अश्वगंधा से बना है। द्वीप एक फ्लोटिंग ट्रीटमेंट वेटलैंड(एफटीडब्लू) है। जो हाइड्रोपोनिक तकनीकी पर काम करता है। एफटीडब्लू में चार परतें हैं। बांस इसका आधार बनाता है। जिस पर स्टायरोफोम क्यूबिकल लगाये जाते हैं। तीसरी परत मे गुनी बैग होते हैं। अन्तिम परत बजरी है जो पौधों को आधार देती है। इसमे नीचे छोटे छोटे छेद होते हैं। जो पानी से पोषक तत्वों के प्रवाह की सुविधा प्रदान करते हैं।एफटीडब्लू पर कई पौधे पानी में मौजूद अतिरिक्त नाईटेटस और आक्सीजन जैसे पोषक तत्वों को अवशोषित कर झील को साफ करने में मदद करते हैं। एफटीडब्लू पर बढ़ रहे सुक्ष्म जीव अपघटन के माध्यम से पानी में कार्बनिक पदार्थों को तोड़कर उपभोग करते हैं। रुट सिस्टम तलछट प्रदुषण को फिल्टर करता है। सीवेज उपचार में जहां रासायनिक अवशेष मिलता है वहीं एफटीडब्लू में रासायनिक प्रदुषक का पौधे उपभोग कर पानी को शुद्ध करते हैं। यह सीवेज उपचार संयंत्र की तुलना में सस्ता और पाकृतिक भी है। एफटीडब्लू की स्थापना 2 फरवरी 2018 को वेटलैंड डे के अवसर पर 100 वर्गफुट में किया गया था। अब 3000 वर्गफुट में है जो भारत बुक ऑफ वर्ल्ड रिकॉर्ड दारा देश का सबसे बड़ा एफटीडब्लू माना जा चुका है।

एफटीडब्लू से		
पहलें	**Parameters**	बाद में
28mg/l	BOD	3.2mg/l
0mg/l	Oxygen	4.5mg/l
27mg/l	Nitrate	8mg/l
7mg/l	Phosphate	0.5mg/l

Bagish Rai
B tech agriculture (17BTAG111)

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Technological Innovations in

INDEPENDENT INDIA

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