

SieTech Chronicles

2022-2023

Department of
Electronics and Communication Engineering



MBITS

MAR BASELIOS
INSTITUTE OF TECHNOLOGY AND SCIENCE
ENGINEERING & POLYTECHNIC COLLEGE



SIEHZ

VISION AND MISSION

Vision of the Institute

To nurture a positive campus culture and equip the younger generation to take our nation forward.

Vision of the Department

To be a center of excellence to produce globally competent technocrats.

Mission of the Department

- M1: To provide quality education and training through effective teaching learning practices.
- M2: To solve the complex technological problems of modern society in the various fields related to Electronics & Communication Engineering.
- M3: To nurture students to improve their leadership and entrepreneurship skills with core values.

TECHNICAL MAGAZINE COMMITTEE

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S6 ECE
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S6 ECE
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Jinto Mathew , Asst Professor, ECE

Program Educational Objectives (PEOs)

Graduates will be able to:

PEO1: To acquire fundamental and advanced concepts of electronics and communication engineering to analyze, design, develop and implement electronic systems or equipment.

PEO2: To apply intelligence and skills in academic, industrial, or research career with creativity, commitment and social awareness.

PEO3 : To work in a team as a member or leader and adapt to the changes taking place in their field through deep-routed learning.

Graduates will be able to:

PSO1: Understand fundamental knowledge of various electronic subjects in the analysis, design and development of analog and digital systems to support the needs of industry and society.

PSO2: Demonstrate the knowledge of signal processing, communication and networking to solve the issues of modern communication systems.

PSO3: Procure proficiency in specialized hardware and software packages useful for the electronic engineering field.



HOD'S MESSAGE

"Hello Team,

As we step into a new year filled with fresh opportunities and challenges, it's time to reflect on our collective journey and celebrate our accomplishments.

Firstly, I want to extend my heartfelt appreciation to each and every one of you for your unwavering dedication and hard work. Your commitment to excellence is the driving force behind our department's success.



In the spirit of collaboration and innovation, let's continue to support each other and explore new ways to exceed expectations. Remember, our strength lies in our unity and diversity of thought.

As we move forward, let's keep communication channels open, share ideas freely, and embrace change with enthusiasm. Together, we can overcome any obstacle and achieve remarkable results.

Thank you for being an integral part of our team. Here's to a productive and fulfilling month ahead!

Best regards,

Prof Johny Joseph,
HOD ECE



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UPI: THE DAWN OF DIGITAL FINTECH NIRVANA

In March 2022, the Reserve Bank of India took a revolutionary leap in the Indian payments ecosystem by launching a version of UPI that can be used on feature phones. This move will be a significant way forward to boost financial inclusion and bring more than 40 million feature phone users into the digital payments fold.

With innovation and committed focus, India has achieved remarkable feats in a digital payments ecosystem that is unmatched globally. In 2020, India surpassed all other countries in the world with the highest number of real-time online transactions, and the latest market studies now estimate that by 2023, digital wallet transactions are expected to overtake cash as the leading point of sale in India. . At the macro level, these are the dividends of the Digital India mission, which has led to a wave of transformation in the country.

UPI FACTORS

Precisely in the case of digital payments, a key driver of our growth was the launch of the United Payments Interface (UPI) in 2017 and its expansion since then. Since the launch of UPI in 2017, India has improved financial inclusion at a CAGR of 5% and more, and since 2018, the country has more than doubled the extent of digitization of payments, as shown by the extensive Digital Payments Index and Financial Inclusion Index. by RBI.

One of the major issues in tech market sand UPI in particular was the fear of market concentration early on, with few digital payment platforms gaining dominance over UPI transactions due to network effects and first mover advantages. Around the time NPCI issued the regulation, only a few digital payments player shad a market share of more than 75% in UPI payments.

THE NEED FOR UPI PROTECTION

Payment clearing is a critical area of economic activity with enormous global, societal and domestic impact. The impact of such dependence has been strongly felt, including accusations against leading app stores for allegedly using their dominant position to extract high commissions from app developers for payment settlements. These concerns need to be isolated in the context of UPI and prevent a few players from gaining dominance over a country's high- potential proprietary technology. Analysis of the market trajectories of technology platforms across geographies strongly reflected that the advantages of network effects and early transition advantages make it challenging for new entrants to achieve a healthy market share.

This can also be realized in the context of UPI payments, where even though there are about 60 UPI payment enablers in the country, exceeding 78% in volume and more than 80% in value as on February 2022, it is still going on. be held by several digital payment applications.

At present ,this appears to be a far-fetched scenario considering that between April 2021 and February 2022, leading payment app UPI's share roughly increased from 45% to 48% (value) and from 44% to 45% in volume, rather than gradually decreasing.

Therefore, as the high-potential UPI technology expands, it is important to ensure that it does not become a victim of quadropoly and that Indian digital payment companies have enough market space to expand in this Indian payment technology. Compliance and aggressive UPI market share thresholds are absolutely necessary for India to protect the family jewel of its payment systems.

- Abhirami Aji
S6 ECE

ESCALATION IN TELECOMMUNICATIONS

India is now the world's second largest telecommunications market with 1.16 billion subscribers and has experienced strong growth over the past decade. According to a report produced by the GSM Association (GSMA) in partnership with the Boston Consulting Group (BCG), India's mobile economy is growing rapidly and will contribute significantly to India's Gross Domestic Product (GDP). In 2019, India overtook the United States to become second largest market in terms of app downloads.

The Indian government's liberal and reform policies, along with strong consumer demand, have contributed to the rapid growth of the Indian telecommunications sector. The government provided easy access to markets for telecommunications equipment and a fair and proactive regulatory framework that enabled consumers to access affordable telecommunications services. Deregulation of foreign direct investment (FDI) norms has made the sector one of the fastest growing in the country and one of the top five job creators.

INVESTMENTS / MAJOR DEVELOPMENT:

As our subscriber base grows every day, there is a lot of investment and development going on in this area. The FDI inflow into the telecom sector from April 2000 to March 2022 was US\$38.33 billion. Here are some of the recent events.

- In January 2022, Google invested US\$1 billion in Airtel through the India Digitalization Fund.
- In October 2021, Vodafone Idea to sell its minority stake to global private equity investors including Apollo Global Management and Carlyle for up to Rs 7.54 crore (USD 1 billion) over the next 2-3 months said it was under consideration.
- In October 2021, British satellite operator Inmarsat Holdings Ltd. announced that it had become the first foreign operator to receive India's approval to sell high-speed broadband to aircraft and ships.

Inmarsat operates through Bharat Sanchar Nigam Ltd. (BSNL) will enter the market after BSNL obtains a license from the Ministry of Telecommunications.

- In October 2021, Dixon Technologies announced plans to invest Rs 200 million (US\$26.69 million) under its PLI telecom scheme. This investment includes the acquisition of the Bharti Group production unit.

In September 2021, Bharti Airtel announced Rs 500 crore (US\$ 673 million) investment to expand its data center business to meet the demand of its customers in and around India.

In August 2021, Narkotata Group announced it was in talks with Canadian company Telesat to launch his high-speed satellite broadband service in India under the Lightspeed brand. Did. . We work with One Web, Elon Musk's SpaceX, and Amazon. March 2021, Vodafone Idea Ltd. (VIL) said spectrum acquired in five circles will improve his 4G coverage and bandwidth, helping to provide customers with a 'better digital experience' announced.

ACHIEVEMENTS: Below are government achievements over the past four years.

- The Ministry of Telecommunications has launched 'Tarang Sanchar', a web portal for sharing information on mobile phone base stations and their EMF compliance.
- Unified Payments Interface (UPI) payouts hit an all-time high of 3.65 billion (volume based), worth ~Rs. 6.54 trillion (\$87.1 billion) as of September 2021.

5G IS THE FUTURE: 5G is the fifth-generation mobile network technology. It is designed to improve network connectivity by solving age-old problems of speed, latency, and usability that previous and current generation cellular networks have failed to address. 5G is said to offer data speeds 100 times faster than 4G networks. The key features are dramatically reduced latency from the current 50 milliseconds to less than 1 millisecond, throughput of up to 10 gigabytes per second, and an exponential increase in the number of connections.

5G LAUNCH IN INDIA: 5G launch in India soon. But when is the million-dollar question? There is no definitive answer to this question, but we are definitely getting closer to the launch of 5G in India. The global deployment of 5G networks is rapidly moving from pilot phases to early commercialization. In India, major network operators are working to roll out next-generation mobile networks. Bharti Airtel is one step closer to the 5G dream in India, announcing earlier this week that it will roll out his 5G service in India by the end of this month. Reliance Jio has to announced his 5G network on August 15th.

Liya Ebby
S8 ECE

THE WORLD'S DEPENDENCY ON GOOGLE

The world always assumes that Google services will be there, from Gmail and YouTube to online storage and smart homes. We take it for granted. Each hour YouTube has 30,000 hours of video uploaded, Google has almost 230 million searches and an enormous number of emails are sent. In terms of connections, Google controls about a third of the surface internet. But on Monday, the 14th of December 2020 all of the Google services suddenly disappeared. Across the world, users were unable to access emails and kicked out of ongoing Google meet sessions, one Twitter user even said that he was left sitting in the dark with his toddler as his Google home system had failed.

The crash had become one of the biggest social media trends and it sent waves of panic across businesses in many parts of the world.

How could one of the largest companies suddenly go dark on all of its services at once?

In total, the outage only lasted one hour but had already caused a lot of chaos. Some interesting things emerge from this event, not only are consumers dependent on Google but many businesses that you may not think are also dependent.

The Google outage caused pandemonium across the world. Some of the biggest companies that use Google services include Uber, Airbnb, Pinterest, Netflix, Spotify, Twitter, and the list goes on. The employees were not able to reach not just these services in terms of Gmail but, in some cases, get into the system. Lots of companies use Gmail to authenticate as we try to get into different websites and web services like Salesforce, Dropbox and so many others that use Google simply to get online. In certain cases, the nest heaters, that control heat air conditioning appeared to be down all across the globe. There were companies literally at a standstill. Gmail, Google Search, YouTube, Google Docs, Google Drive, Nest Home Systems, Google Play, and even Stadia, all went down. The Wall Street Journal newsroom was dependent on Google services, so during the outage, some reporters had to resort to using telephones to collaborate in writing stories some schools in the USA had to close for the day. Wayne Westland community schools in Michigan gave its combined 10,000 students the day off after Google crashed. all went down. The Wall Street Journal newsroom was dependent on Google services, so during the outage, some reporters had to resort to using telephones to collaborate in writing stories some schools in the USA had to close for the day. Wayne Westland community schools in Michigan gave its combined 10,000 students the day off after Google crashed.

The school relied on Google meet for classes many other educational institutions would have been affected due to the prevalence of online classes because of the pandemic. There were also cases of the management of medical companies not being able to check on the schedules of physicians and other medical staff nor being able to contact customers. Remote work and learning had made individuals and businesses more dependent on online services than ever and in this domain, Google is the most widely used. All in all, the outages affected billions of people worldwide.

A Google spokeswoman told the wall street journal that there was a problem with the company system that authenticates login credentials. She stated that the problem was due to internal servers and that the issues weren't the result of a cyber-attack. This explanation doesn't give us much but that's just about all that Google said about the issue. It's rare for Google to have such a global outage like this because even a single physical geography is served by multiple servers across the world and even on these servers there are multiple backups that rapidly come online if there's a problem. As we've seen so much commerce and people's livelihoods rely on Google, which raises some serious questions what if next time Google was down not just for an hour but for days? Billions of dollars in revenue could be lost by companies around the world.

How does Google prevent this?

Google calls their plan to keep their services up and running, Site Reliability Engineering or SRE coined all the way back in 2006. SRE is a digital design philosophy basically for Google, the idea is to get software coders to run software management instead of getting IT managers to run it people call this kind of philosophy DevOps.

DevOps is basically development software coding that provides the outcomes of a system administrator. The thinking goes as follows; software coders will get bored by performing tasks by hand and naturally, build tools to help automate the process without the involvement of actual people. Google states that SRE is its most fundamental feature. Todd Underwood of Google, in 2016 told Wide magazine, "We long for the day when nobody runs anything!"



Traditionally, development and operations were opposing forces. The Devs always wanted to build new software and get the changes out to the public as fast as possible but the operations staff wanted to ensure that nothing went wrong and the best way to do this is to keep the changes to a minimum. The trick that Google found is that if you combine development and operations, you can get a powerful synergy for a reliable system. Google is the world's largest online empire, the more humans you have running things the more probability there is for mistakes. So just have code run everything but within that human coders can still make mistakes.

Some say that Google's outage temporarily crippled the productivity of billions around the world and has made the biggest anti-trust argument anyone could have ever done. Google had to face off against the US department of justice for violating anti-trust laws. Google's lawsuit is one of the biggest anti-trust cases since Microsoft in 1998. So, what can be done?

The solution is that there are alternatives to Google for every service they provide, what it all comes down to is trading the convenience that we've all gotten used to. From this, we can understand that, indeed, the world is dependent on Google.

Vyshnavu Santhosh
S8 ECE

QUANTUM COMPUTING & IT'S APPLICATION

The quantum in "quantum computing" refers to the quantum mechanics that the system uses to calculate outputs. In physics, a quantum is the smallest possible discrete unit of any physical property. It usually refers to properties of atomic or subatomic particles, such as electrons, neutrinos and photons.

A qubit is the basic unit of information in quantum computing. Qubits play a similar role in quantum computing as bits play in classical computing, but they behave very differently. Classical bits are binary and can hold only a position of 0 or 1, but qubits can hold a superposition of all possible states.

Quantum computers harness the unique behavior of quantum physics—such as superposition, entanglement and quantum interference—and apply it to computing. This introduces new concepts to traditional programming methods.

A quantum computer has three primary parts:

- An area that houses the qubits.
- A method for transferring signals to the qubits.
- A classical computer to run a program and send instructions

For some methods of qubit storage, the unit that houses the qubits is kept at a temperature just above absolute zero to maximize their coherence and reduce interference. Other types of qubit housing use a vacuum chamber to help minimize vibrations and stabilize the qubits. Signals can be sent to the qubits using a variety of methods, including microwaves, laser and voltage.



APPLICATIONS OF QUANTUM COMPUTING

Cryptography: Classical cryptography—such as the Rivest–Shamir–Adleman (RSA) algorithm that is widely used to secure data transmission—relies on the intractability of problems such as integer factorization or discrete logarithms. Many of these problems can be solved more efficiently using quantum computers.

Quantum machine learning: Machine learning on classical computers is revolutionizing the world of science and business. However, training machine learning models comes with a high computational cost and that has hindered the scope and development of the field. To speed up progress in this area, we are exploring ways to devise and implement quantum software that enables faster machine learning.

Optimization: Optimization is the process of finding the best solution to a problem given its desired outcome and constraints. In science and industry, critical decisions are made based on factors such as cost, quality and production time—all of which can be optimized. By running quantum-inspired optimization algorithms on classical computers, we can find solutions that were previously impossible. This helps us find better ways to manage complex systems such as traffic flows, airplane gate assignments, package deliveries and energy storage.

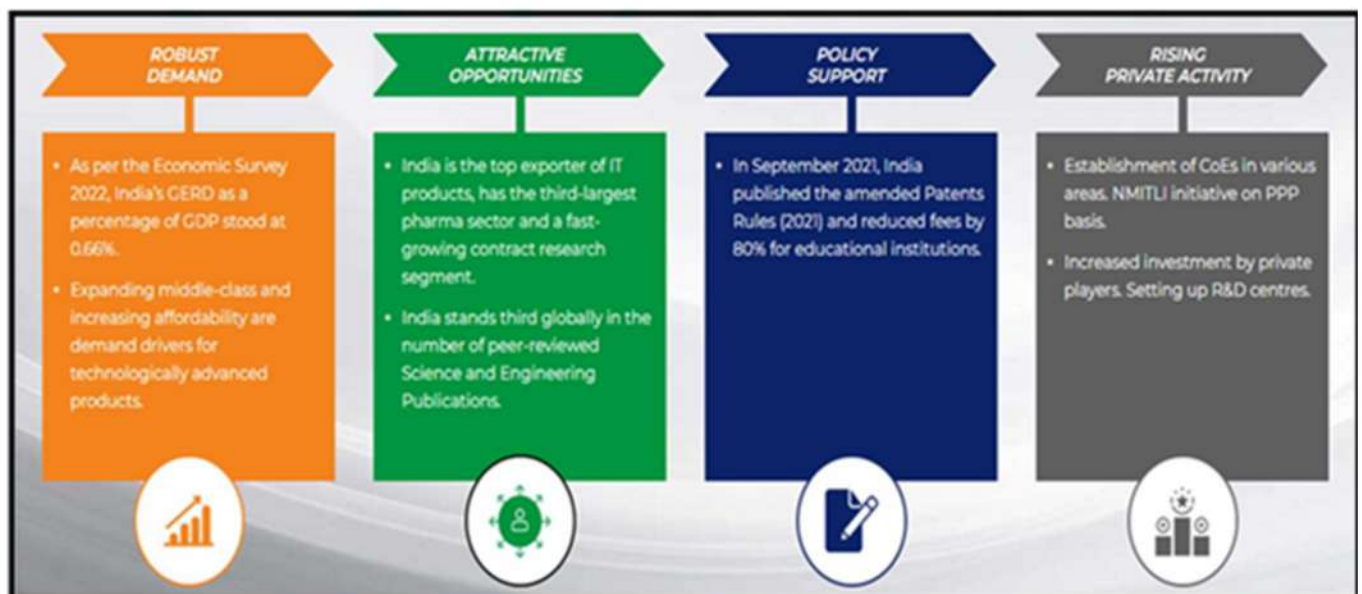
Quantum simulation: Quantum computers work exceptionally well for modelling other quantum systems because they use quantum phenomena in their computation. This means that they can handle the complexity and ambiguity of systems that would overload classical computers. Examples of quantum systems that we can model include photosynthesis, superconductivity and complex molecular formations.

Search: A quantum algorithm developed in 1996 dramatically sped up the solution to unstructured data searches, running the search in fewer steps than any classical algorithm could.

**-Safa Subair
S6 ECE**

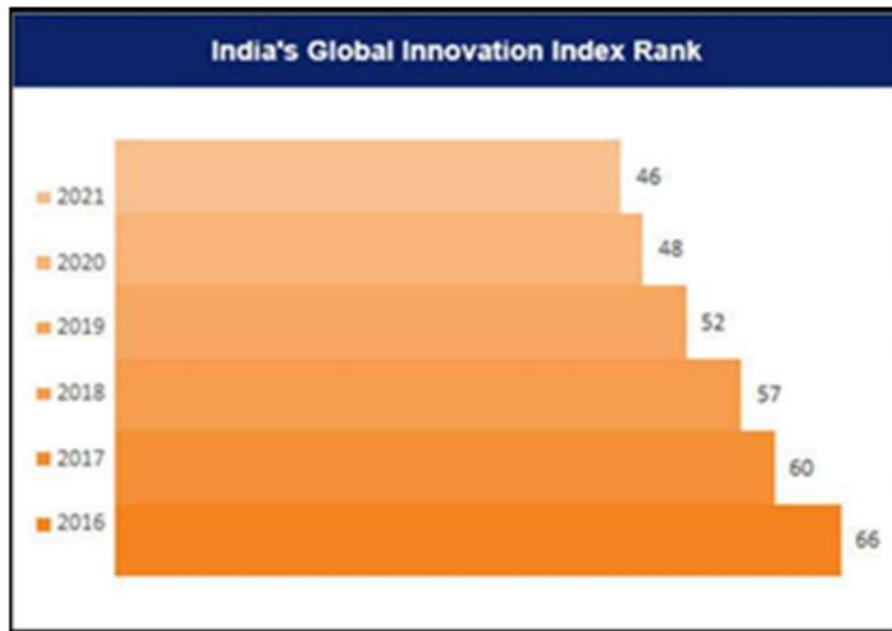
JOURNEY OF SCIENCE & TECHNOLOGY IN PAST 75 YEARS

Modern India is an epitome of Scientific and Technological Development and is one of the key elements for economic growth. Post 15th August 1947, India's journey has become a great example of an impressive growth story. As claimed by the Indian Brand Equity Foundation, India is among the topmost countries in the world in the field of science and technology. India ranks third among the most attractive investment destinations for technology transactions in the world. Modern India has a strong focus on science and technology, realizing that it is a key element for economic growth. India is among the top five nations in the world in the field for space exploration. The country has regularly undertaken space missions, including missions to the moon and the famed Polar Satellite Launch Vehicle (PSLV). India is likely to take a leading role in launching satellites for the SAARC nations, generating revenue by offering its space facilities for use to other countries.



Our First Prime Minister, Pandit Jawahar Lal Nehru said “Science is not merely an individual's search for truth; it is something infinitely more than that if it works for the community”. He made efforts to convert India's economy into that of a modern state of art. By 2022, R&D expenditure is targeted to reach about 2% of the country's GDP. The engineering R&D and product development market in India is forecast to post a CAGR of 12% to reach US\$ 63 billion by 2025, from US\$ 31 billion in 2019. As per the Economic Survey 2022, India's gross domestic expenditure on R&D (GERD) as a percentage of GDP stood at 0.66%.

IT spending in India will grow 7% YoY to reach US\$ 101.8 billion in 2022, compared to US\$ 81.89 billion in 2021. In FY21, the science and technology sector added 497,501 employees, becoming India's top employment generator.



Over the last 75 years, India has become a bedrock for innovation in the technology sector. We are currently a major drive of the software-as-a-service revolution, a startup innovation hotbed with over 100 unicorns, a quick adopter of services centered on cutting-edge technologies like AI and ML, and above all a world leader in IT Services. India's National Artificial Intelligence Strategy prepared by NITI Aayog outlined a way forward to harness the potential of Artificial Intelligence (AI) in different fields. Accenture offers a framework for assessing the economic effect of AI for selected G20 countries in its latest AI research studies and forecasts that AI will raise India's annual growth rate by 1.3% by 2035. Some of the recent developments in the field of science and technology in India are as follows:

- Actis, a global investor in sustainable infrastructure, is planning to invest over US\$ 700 million in order to acquire and expand assets for its platform aimed at offering real estate to tenants in the life sciences and allied sectors in India.
- In March 2022, Toyota launched its Mirai hydrogen fuel cell car in India. The Indian Oil Corporation would be supplying hydrogen to power the car.
- India's Top 5 IT firms (TCS, Infosys, Wipro, HCL and Tech Mahindra) added more than 122,000 employees in in the first six months of FY22, nearly matching the 138,000 employees hired in the entirety of FY21.
- In October 2021, Biz2Credit, a fintech company, announced plan to invest US\$ 100 million in India over the next five years on research and development activities and expansions.
- From 2014 to 2021, India recorded a 572% growth in patent approvals.

- To accelerate digital innovation in India, NITI Aayog, Amazon Web Services and Intel have come together to develop a new experience studio to boost problem-solving and innovation between government stakeholders, start-ups, enterprises and industry experts. The new experience studio will use technologies such as artificial intelligence, machine learning, Internet of Things, augmented reality, virtual reality, blockchain and robotics to accelerate their use in the public sector.
- Techno Pro, a Japanese tech firm, plans to hire 10,000 engineers and researchers in India by 2022-23.
- Qualcomm plans to invest US\$ 8.5 million on design initiatives in India, which would include funding its innovation labs at Hyderabad and Bangalore for R&D.

India is aggressively working towards establishing itself as a leader in industrialization 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 India's pharmaceutical industry. The agriculture sector is also likely to undergo a major revamp with the government investing heavily for a technology-driven Green Revolution. 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.

-Gloria Eldhose
S4 ECE

INDIAN SPACE PROGRAM



The beginnings of the Indian Space Program began in 1962 when INCOSPAR (Indian National Committee for Space Research) was established. In 1972, the Space program was formalized with the creation of the DOS (Department of Space) and the Space Committee. This was done to formulate and implement roles related to research and technology in the country. The scientific committee is the focal point for coordinating research and development activities related to science and technology. And DOS is the executive branch of this Russian Commission, which operates through major national bodies such as ISRO, NRSA, RRL, NMRF and NE-SAS. DOS also supports educational institutions by sponsoring research-related projects.

In 1969, the Government of India established his ISRO for the purpose of rapid development and development of the science and technology sector. The Indian Space Research Organization (ISRO) was founded by Dr. Chaired by Vikram Sarabhai of Ahmedabad, the organization was headquartered in Bangalore. Dr. Vikram Sarabhai, as Chairman of the Executive Board, assisted in policy drafting, policy development and oversaw the implementation of all national policies. ISRO has objectives aimed at empowering technology and data for India's development.

ISRO has assisted the country with media and education after successfully launching a satellite. ISRO also aims to oversee the collection and management of the country's natural resources using remote sensing technology, weather forecasting and environmental monitoring. India's racing program included the development and launch of several indigenous satellites, rockets, racing orbiters and rockets.

Besides ISRO, there are other research organizations in India such as:



1. Space Applications Centre: SAC is the organization located in Ahmedabad that engages in the development of payloads for satellite communication, remote sensing, and meteorology.
2. Vikram Sarabhai Space Center: VSSC is the leading organization for the development and launch of various satellites and satellite vehicles and similar related space technologies. VSSC was located at Thiruvananthapuram, India.
3. Liquid Propulsion Systems Center: India's leading organization for the development of liquid and cryogenic propulsion systems for satellites and rockets is LRSC. The company involved in the commercial marketing of racing-related products and services, in addition to research and development services for the Indian Race Program, is called Antares Corporation. The Antares Corporation is an entirely government owned company that was established in 1992.

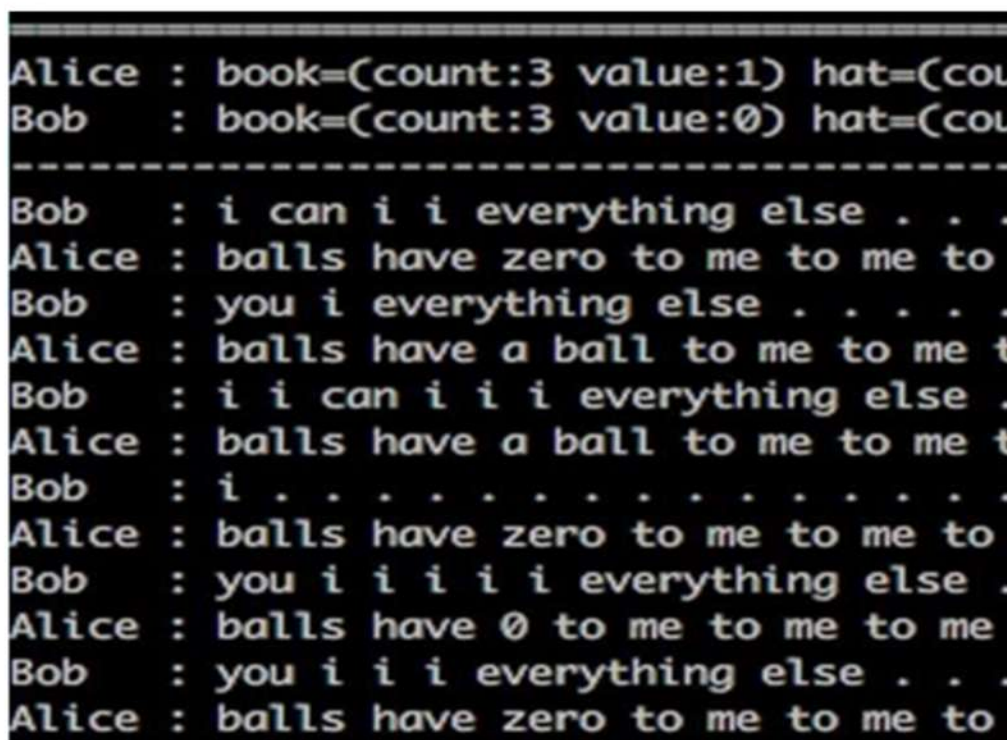
Some of the major achievements of Indian Space Programs are the successful launch and operation of several satellites and satellite vehicles, like the AstroSat, Mangalyaan, Chandrayaan 1 & 2, PSLV, GSLV, etc. We are pleased that the government has invested heavily in India's Space Programs over the last 20 years. Indian science programs have a long way to go before India realizes its dream of establishing the world's best science and technology.

-Sreyas M
S8 ECE

AI AND LANGUAGE

Facebook abandoned the experiment after two artificially intelligent programs appeared to be chatting in a foreign language that only they understood. Two chatbots have come up with their own changes to English that have made their jobs easier but that have remained mysterious to the people who supposedly care about them.

The bizarre discussions came when Facebook invited its chatbots to try to negotiate a trade with each other, trying to exchange hats, balls and books, each of which had a certain value. But they quickly broke down when the robots appeared to be chanting at each other in a language they each understood, but which seemed mostly unintelligible to humans. The bots were instructed to figure out how to negotiate with each other and improve their bartering as they went. But they weren't told to use plain English, which the researchers say allowed them to create their own "shorthand."



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Alice : book=(count:3 value:1) hat=(cou
Bob   : book=(count:3 value:0) hat=(cou
-----
Bob   : i can i i everything else . . .
Alice : balls have zero to me to me to
Bob   : you i everything else . . . . .
Alice : balls have a ball to me to me t
Bob   : i i can i i i everything else .
Alice : balls have a ball to me to me t
Bob   : i . . . . .
Alice : balls have zero to me to me to
Bob   : you i i i i i everything else .
Alice : balls have 0 to me to me to me
Bob   : you i i i everything else . . .
Alice : balls have zero to me to me to
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In early 2017, Google revealed that the AI it uses for its Translator tool has created its own language to translate things into and then translate from. But the company was happy with this development and allowed it to continue. Another study at Open AI found that artificial intelligence can be encouraged to create language, making it more efficient and better at communicating. The main difference between artificial intelligence and human intelligence is that artificial intelligence systems can absorb vast amounts of information quickly and efficiently. This makes the software much better at grammar and vocabulary than the human brain, especially in unfamiliar languages.

The rise of artificial intelligence may eventually lead to fewer people trying to learn a new language. Instead, they can only rely on language models of machine translation and natural language processing. Our ability to learn new languages declines significantly after the age of 17. However, the technology is far from perfect.

Unlike the human brain, artificial intelligence cannot understand humor, subtext, and especially context. In other words, when an AI speaks or writes, it has no idea what it's saying. Although it can provide us with the translation of thousands of words from other languages, it cannot understand where the translation falls short. Machine translation, on the other hand, creates understandable language that lacks expressions simply because it cannot understand the nuances of different languages. This could potentially make us abandon the complex idioms of our speech. However, not all the effects of artificial intelligence on our language are negative. For example, AI in communications and brand compliance can respond to messages in a similar way to company guidelines. And it also eliminates negative tone and emotions.

In fact, one study analyzed Gmail's tool that suggests possible responses to received email. The challenges it offers have been found to have a much more positive tone than what people usually use. In the long run, Gmail seems to have the potential to change the way and language people use to interact with each other. On the other hand, humans understand quite well when a message comes from AI. This form of communication does not always evoke positive feelings. Another study found that people often feel a sense of distrust when an Airbnb host uses an AI-generated profile. Although artificial intelligence has not been around for that long, findings show that it is already affecting our language. It also affects our social relationships, workplace communication and interactions with other people.

Badusha Ali
S6 ECE

5G AND WI-FI6 CONNECTIVITY

5G deployment will be accelerated in the new age of infrastructure. However, one more communication technique comes to mind: Wi-Fi 6. Coexistence or competition? What type of future connection will these two have?

Although the idea and implementation of 5G has been widely promoted, some individuals may not be familiar with Wifi6. This is actually a protocol, Wi-Fi device protocol 6. Wifi6 was created for the era of the Internet of Everything with the capacity to allow more device connections and more consistent communication, similar to 5G.

5G and the technologies that support it

Let's start with the fifth generation of mobile networks. 5G has advanced features that earlier generations lacked, such as ultra-fast communication due to reduced latency and wholesale 5G lines also available in the market. High performance, efficiency and reliability are all benefits of 5G.

The core technologies of 5G are orthogonal frequency division multiplexing (OFDM) and the new radio (NR) interface of 5G. OFDM is a technique for reducing interference by modulating digital signals over multiple channels. 5G also uses wide-bandwidth technologies such as Sub-6 GHz and mm Wave, which are very fast but have relatively limited range.

These sensors can also connect directly to each other, allowing for a very fast and efficient flow of data between devices.

Hundreds or thousands of interconnected IoT sensors can be used for many reasons, such as monitoring blood pressure or heart rate, testing urine for kidney function, and even monitoring skin tissue oxygenation levels!



Some examples of use cases related to 5G

For various reasons, such as content creation and consumption, a faster mobile device connection is preferable. For example, faster video traffic improves the experience of watching media and entertainment content. Video streaming, social networking, banking, food delivery, e-commerce and retail will all benefit from 5G's capacity to transfer speeds of up to 20 gigabits per second.

5G will be essential for mission-critical communications such as remote healthcare, security, autonomous cars and smart city infrastructure monitoring. It also connects IoT devices, sensors and equipment used in manufacturing, automotive security, aerospace, military and healthcare.

5G offers a wide range of applications thanks to its excellent performance, reliability and efficiency. It connects IoT devices and enables enterprises to build and deploy private 5G wireless networks. As a result of its long-term impact on manufacturers, operators, content providers, application developers and consumers, 5G is rapidly becoming a major driver of global economic development.

Conclusion

This means that 5G and Wi-Fi 6 will be key technologies to support various IoT applications; for example, home automation systems will rely on high data speeds to enable features such as remote video chatting, smart locks and even the ability to turn on appliances with your voice.

Haritha P Nair
S8 ECE



MAR BASELIOS INSTITUTE OF TECHNOLOGY AND SCIENCE (MBITS)
ELECTRONICS AND COMMUNICATION ENGINEERING (2019 - 2023)



"Scientists study the world as it is; engineers create the world that has never been." —Theodore von Karman