# VIDYA PRATISHTHAN's KAMALNAYAN BAJAJ INSTITUTE OF ENGINEERING AND TECHNOLOGY, BARAMATI

## Department of Electronics and Telecommunication Engineering

VPKBIET

# ELECTRONICA

## August 2022

# Department of Electronics and Telecommunication Engineering

## About Department:

Electronics And Telecommunication Department was established in the year 2000. The intake for under graduate course is 60. Electronics And Telecommunication Department is committed to provide quality education in the field of Telecommunication. The strength of the Department is qualified and devoted faculty, motivated students and well equipped labs Our faculty and students work together to study, experiment and to solve problems in the various fields such as Networking, Security, Information Retrieval, Image Processing and Pattern Analysis.

## Mission:

To develop professionals in Electronics and Telecommunication Engineering to contribute in solving technological problems faced by society.

## Program Educational Outcomes:

- To apply the knowledge of Electronics and Telecommunication Engineering to build career in core and allied industries
- To prepare students for higher studies, competitive exams and multidisciplinary work
- To follow professional ethics and address social concerns
- To be lifelong learner to engross newer technologies

## Program Specific Outcomes:

**PSO1:** To develop competencies to solve real-life problems in the Electronics and Telecommunication Engineering domain at the same time inculcate professional behavior imbibe with human values and ethics .

**PSO2:** To acquire the knowledge of embedded systems, communication, signal processing for hardware/software design and development.

**PSO3:** To demonstrate the competencies to use modern tools and techniques to design electronic systems in diverse fields as per societal needs.

# Principal's Desk

Dr. R. S. Bichkar
Principal,
Dept of E & TC Engineering
VPKBIET, Baramati.

I am pleased to hear that Department of Electronics and Telecommunication Engineering is publishing the August 2022.issue of department magazine, 'Electronica'.

I feel very elated and at the same time privileged to share a few words as you go through the pages of the magazine "Electronica". Electronics and Telecommunication department endeavors to help students to seek the best from the surroundings. The knowledge thus gained becomes a ladder for them to soar into greater heights. It's often the collective effort that leads to the discovery and fulfillment of aspirations.

I am sure, the task force of Electronics and Telecommunication engineering department has taken lead, to one of the best examples of not only the land of ideas but also the forest of excellent products.

# Vice-Principal's Desk

Dr. S. B. Lande
Vice-Principal,
Dept of E & TC Engineering
VPKBIET, Baramati.

I am delighted to hear that the Department of Electronics and Telecommunication Engineering is bringing their Technical Magazine 'Electronica' Issue-July 2022. It is a tool for faculty and students to develop productive technical materials and support skills. The most important thing you can get out of this fantastic effort is that it brings out the various technical and analytical skills of novice engineers. I am happy to welcome all the teachers and students who are more interested in bringing articles with more bright concepts and innovative ideas in the coming issues.

I wish the "Department of Electronics and Telecommunication Engineering" of this organization great success in all their endeavors. I congratulate the Head of the Department of Electronics and Telecommunication Engineering, the Editor and his dedicated committee for their invaluable efforts in bringing this issue to the fore. I wish them all success.

# HOD's Desk

Dr. B.H.Patil
HOD
Dept of E & TC Engineering
VPKBIET, Baramati.

Ever since the department of Electronics and Communication Engineering started its journey over two decades back, the department has been simultaneously and successfully performing the multiple roles of creating new knowledge, acquiring new capabilities and producing an intelligent human resource pool contributing in various domains of the society. The Department has always been on a high growth path and has experienced and dedicated faculty with strong commitment to engineering education who work with zeal and enthusiasm to provide a vibrant and optimum learning environment.

The growth of expertise in the department is commendable. In keeping with the department's vision, the holistic development of the students is focused upon that instills a habit of continued learning and a sense of responsibility in them to contribute towards the betterment of the society.

The periodically updated curriculum imparts technical knowledge to the students and the application based environment in the state of the art laboratories complements the same. The students are motivated to participate in paper presentation, workshops and seminars that are essential to maintaining proficiency. Cultural activities are also promoted through various clubs at the Departmental and University level.

# HOD’s Desk

A strong positive reputation of the department pulls companies like TCIL, HCL, TCS, Perot Systems and many more for campus recruitment. A large percentage of students also qualified GATE exam for pursuing higher studies.

If you have further questions after vising our website which provides details of faculty members, research activities, research facilities and various student activities, please feel free to contact us on email address provided on faculty pages.

# EESA-Electronics and Telecommunication Engineering Students Association


**EESA Coordinator**

**Mrs. More Monali U**

**Dept of E & TC Engineering**

**VPKBIET, Baramati.**


EESA-Electronics and Telecommunication Engineering Students Association is a platform for the Electronics and Telecommunication Engineering Students to share the knowledge, intelligence, abilities, and experiences together and rise together. The main objective of this students association is to fortify the curricular, extracurricular, professional, social abilities of student's community and organize the related programs within the department to enhance the objective

The core committee students of EESA conduct programs with the students and the department. It enriches strong bond between the students and improve their capabilities for new ones. We, the EESA works for the students in all dimensions viz. academic, cultural, sports etc. In academic activities we organize expert talks, seminars, poster presentation, weekly aptitude tests, GATE MOCK Tests; in cultural activities we organize art gallery exhibitions, creativity corner space on EESA board, art competitions; and in sports activities we organize departmental indoor and outdoor games. We conduct varieties of preplanned events throughout year.

**Our AIMS and OBJECTIVES**:

- To enhance the multidisciplinary qualities of the students.
- To create the awareness to foster the knowledge in the related field through regular meetings, GD, talks, seminars and questionnaires.
- To enhance the workaholic and conjunctive abilities, team spirit, of the active members.
- CC-PROP (Come Commit Plan Rehearse Organize Prove) is our motto.

# Team EESA 22-23

| Sr.No. | Position | Name | Class |
|---|---|---|---|
| 1 | President | Divya Parvekar | BE |
| 2 | Secretary | Rushikesh Kasture | BE |
| 3 | Treasurer | Shweta Kalshetty<br>Shreya Mane | BE |
| 4 | Academic Head | Ajay Narale | BE |
| 5 | Cultural Head | Shreya Jagtap<br>Rudrakshi Pol | BE |
| 6 | Sports Head | Samarth Kamble | BE |
| 7 | Asst. President | Akash Koli | TE |
| 8 | Asst. Secretary | Tushar Patil | TE |
| 9 | Asst. Treasurer | Divya Gaikwad | TE |
| 10 | Asst. Academic Head | Dipti Choudhary | TE |
| 11 | Asst. Cultural Head | Chaitanya Gore | TE |
| 12 | Asst. Sports Head | Akanksha Shitole | TE |
| 13 | Active Members | Aditi Prakash Teke<br>Vaishnvi Sawant<br>Priti Rawal<br>Sakshi Patil<br>Asavari Vanve<br>Pooja Gaikwad<br>Vaishnvi Divekar<br>Priya Tawade<br>Sneha Thele<br>Shubhanshu Nalge<br>Anurag Kakade<br>Atharv Gore<br>Omkar Mandhare | SE |
| | | | |

# RTTIA-2022

The objective of RTTIA-2022 is to present the latest research and results of scientific studies of UG and PG Students, research scholars, and academics and Industry professionals related in various engineering fields (Electrical, E&TC, Computing, Mechanical, Civil etc.) The conference will feature traditional paper presentations as well as keynote speeches by prominent speakers who will focus on related state-of-the-art technologies in the areas of the conference. Nowadays the academia and researchers are not only exploring various emerging and advanced technologies but also experiencing the overwhelming outcomes of interdisciplinary research. Moreover, it has been ubiquitously encouraged by the governments, research agencies and by the academic institutions. The intent behind the multidisciplinary international conference is to provide a common platform, where academia, delegates from industry and nominees from various Government and Private Universities and Institutions can present their valuable research findings and deliberate upon futuristic approaches.

The deliberations will not only encompass all fields avenues of engineering but also through focus on industry and societal application.

Broad Areas for Research papers: E & TC and Electrical Engineering Embedded System, Communication, Audio, Image, Video Signal Processing, VLSI, Quantum Computing. Renewable Energy, Smart Grid, Reliability evaluation of PV cells, Power Systems & Devices, Battery Management Systems, Electric Vehicles. Computing Technology Network & Information security, Software Engineering, IoT, Cloud Computing, Wireless Network, Data Mining, Business Analytics, Big Data, Machine Learning, Deep Learning. Mechanical And Civil Engineering Robotics and Automation, Structural, Environmental etc. Emerging Technology 3-D Printing, Blockchain, Artificial Intelligence, Virtual Reality and Augmented Reality

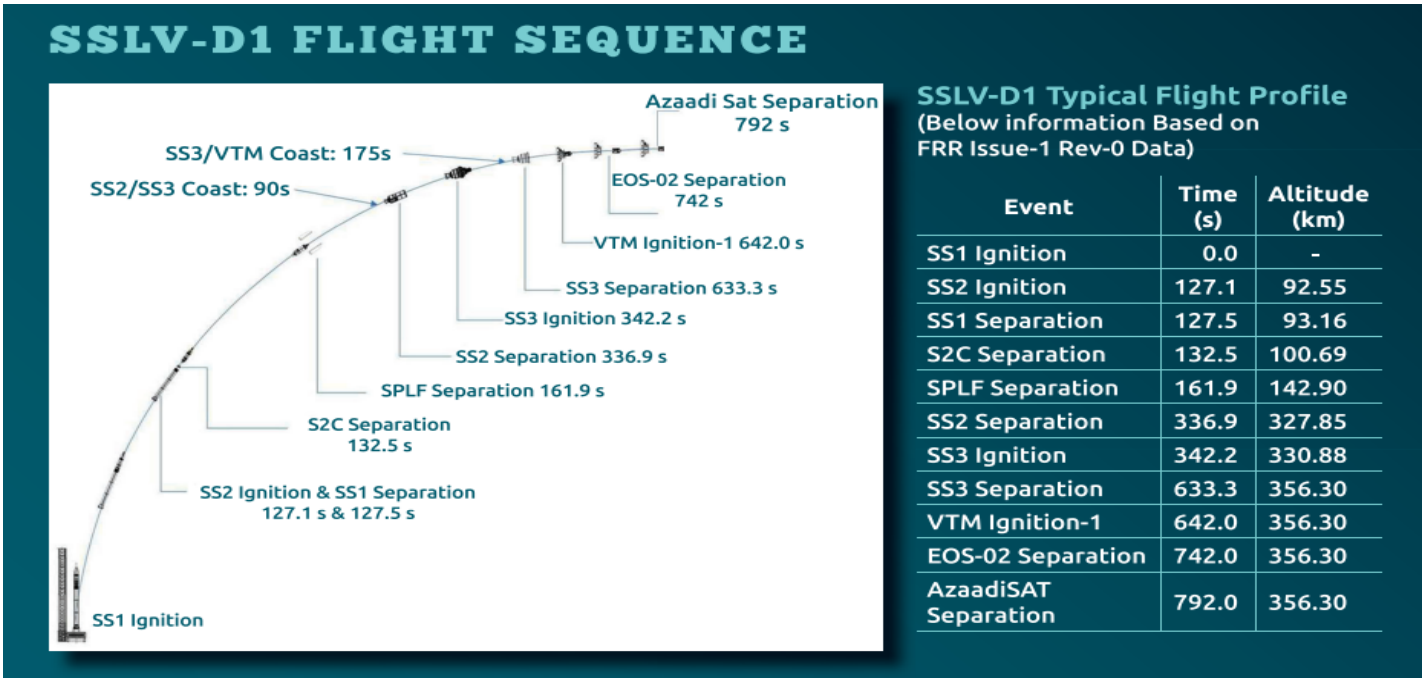
# ISRO’s baby rocket: Small Satellite Launch Vehicle (SSLV)

Scientists at the ISRO have been engaged in developing small launch vehicles over the last few weeks to meet the demand for such small satellites. The SSLV is 34m tall, about 10m less than the PSLV and it has a vehicle diameter of two metres as compared to 2.8 metres of PSLV. SSLV has a lift off mass of 120 tonne while PSLV has 320 tonnes, which can carry payloads up to 1,800 kgs. The projected high launch rate relies on largely autonomous launch operation and on overall simple logistics. To compare, a PSLV launch involves 600 officials while SSLV launch operations would be managed by a small team of about six people. The launch readiness period of the SSLV is expected to be less than a week instead of months. The launch vehicle can be assembled both vertically like the existing PSLV and Geosynchronous Satellite Launch Vehicle (GSLV) and horizontally like the retired Satellite Launch Vehicle (SLV) and Augmented Satellite Launch Vehicle (ASLV).

The **Small Satellite Launch Vehicle** (**SSLV**) is a small-lift launch vehicle developed by ISRO with payload capacity to deliver 500 kg (1,100 lb) to low Earth orbit (500 km (310 mi)) or 300 kg (660 lb) to Sun-synchronous orbit (500 km (310 mi)) for launching small satellites, with the capability to support multiple orbital drop-offs. SSLV is made keeping low cost, low turnaround time in mind with launch-on-demand flexibility under minimal infrastructure requirements.

The SSLV was developed with the aim of launching small satellites commercially at drastically reduced price and higher launch rate as compared to Polar Satellite Launch Vehicle (PSLV). The development cost of SSLV is ₹169.07 crore (US$21 million) and the manufacturing cost is expected to be ₹30 crore (US$3.8 million) to ₹35 crore (US$4.4 million).

The first three stages of the vehicle use HTPB based solid propellant, with a fourth terminal stage being a Velocity-Trimming Module (VTM) with eight 50 N thrusters for reaction control and eight 50 N axial thrusters for changing velocity. The first stage (SS1) and third stage (SS3) of SSLV are newly developed while second stage (SS2) is derived from third stage (HPS3) of PSLV

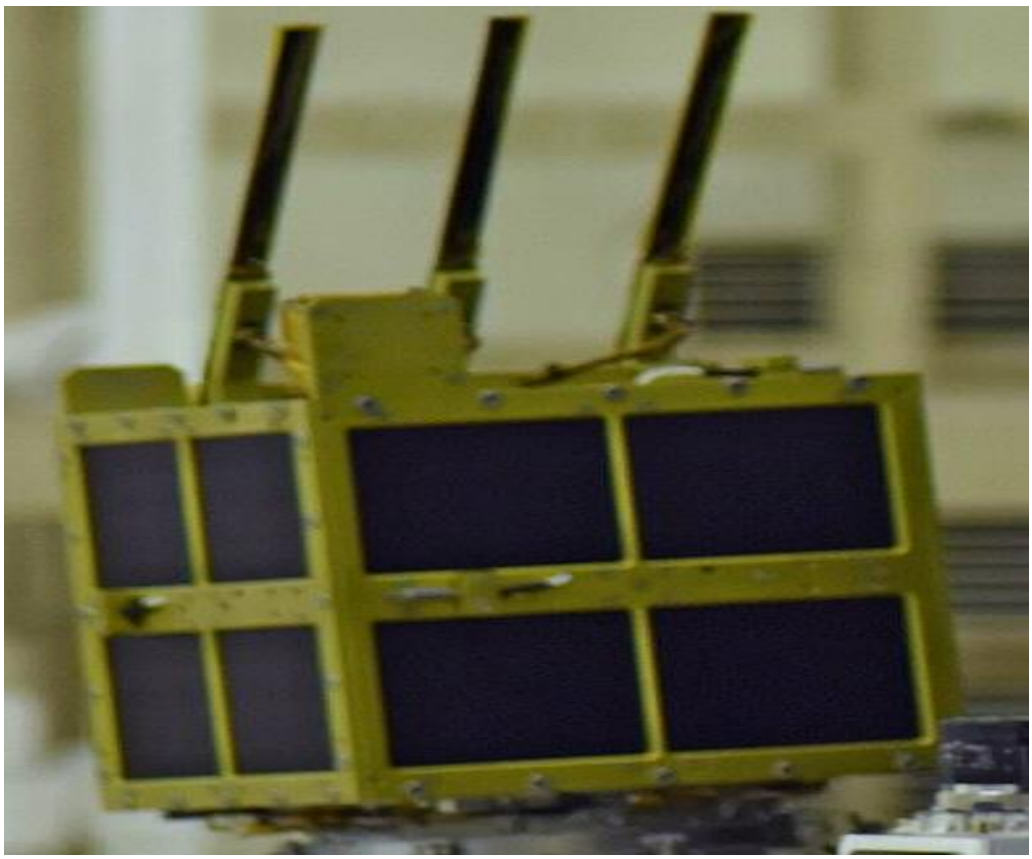



| Event | Time (s) | Altitude (km) |
|---|---|---|
| SS1 Ignition | 0.0 | - |
| SS2 Ignition | 127.1 | 92.55 |
| SS1 Separation | 127.5 | 93.16 |
| S2C Separation | 132.5 | 100.69 |
| SPLF Separation | 161.9 | 142.90 |
| SS2 Separation | 336.9 | 327.85 |
| SS3 Ignition | 342.2 | 330.88 |
| SS3 Separation | 633.3 | 356.30 |
| VTM Ignition-1 | 642.0 | 356.30 |
| EOS-02 Separation | 742.0 | 356.30 |
| AzaadiSAT Separation | 792.0 | 356.30 |

The first developmental flight of the SSLV occurred on 7 August 2022. The flight mission was named SSLV-D1. The SSLV-D1 flight failed to achieve its mission objectives. The rocket had a three stage configuration with a fourth Velocity Trimming Module (VTM). The rocket carried EOS 02, an Earth observation satellite that weighed 135kg and AzaadiSAT, a CubeSat payload that weighed 8kg,

developed by Indian students to promote inclusivity in STEM education. The SSLV-D1 was supposed to place the two satellite payloads in a circular orbit of altitude 356.2km with 37.2° inclination.


**AzaadiSAT** was a Indian Earth observation 8U Cubesat weighing around 8 kg developed by the Space Kidz India as a test payload on the maiden launch of the Small Satellite Launch Vehicle (SSLV). It was hitching a ride with EOS-02, the primary satellite of the mission. The launch on 7 August 2022 was a failure leading to imminent return to atmosphere for the rocket and the satellites (AzaadiSAT and EOS-02) it carried, destroying them all.It was created to mark India's 75th year of independence. This anniversary was being marked in 2022 by the Azadi Ka Amrit Mahotsav celebrations throughout the country, and the CubeSat was part of this campaign. AzaadiSAT was built by schoolgirls from 75 schools across India. 10 girls from each school were involved, for a total of 750 students involved. The mission was created to give girls from lower-income backgrounds the opportunity to learn the fundamentals of spaceflight, as part of the United Nations theme of "women in space".



**AzaadiSAT**

It carried 75 different payloads each weighing around 50 grams and conducting femto-experiments. Girl students from rural regions across the country were provided guidance to build these payloads. The payloads were integrated by the student team of "Space Kidz India". The payloads included a UHF-VHF transponder working in ham radio frequency to enable voice and data transmission for amateur radio operators, a solid state PIN diode-based radiation counter to measure the ionizing radiation in its orbit, a long-range transponder and a selfie camera to take pictures of its solar panels and the Earth. The ground system developed by 'Space Kidz India' was to be utilized for receiving the data from this satellite.

**EOS-02** (formerly known as **Microsat-2A**) was an Indian Earth observation microsatellite developed by the Indian Space Research Organization as a test payload on the maiden launch of the Small Satellite Launch Vehicle (SSLV).EOS-02 was based on Microsat-TD.

The objective behind EOS-02 was to realize and fly an experimental imaging satellite with short turnaround time to showcase launch on demand capability.

It was intended to be used for cartographic applications at a cadastral level, urban and rural management, coastal land use and regulation, utilities mapping, development and various other GIS applications. The satellite carried two payloads: a mid-wavelength and a long-wavelength infrared camera with a 6m resolution.

The official explanation for the mission failing to achieve the intended orbit is software malfunction. According to the ISRO, the mission software logic failed to identify a sensor fault in the final stage. The final VTM stage fired only for 0.1s instead of the intended 20s.This VTM stage failure led to the two satellites as well as the VTM stage of the rocket being injected into an unstable elliptical 356km x 76km orbit.

VPKBIET has joined the outreach program of Indian Institute of Remote Sensing under Indian Space Research Organization. IIRS Outreach Programme focusses on strengthening the Academia and User Segments in Space Technology & Its Applications using Online Learning Platforms. Under this programme the two modes of content delivery system is developed using online learning platforms (i.e) Live & Interactive mode (known as EDUSAT) and e-Learning mode. Every student must learn the basics of space technology and applications by enrolling in the courses floated by IIRS and join hands with ISRO to develop technology for common people of India.

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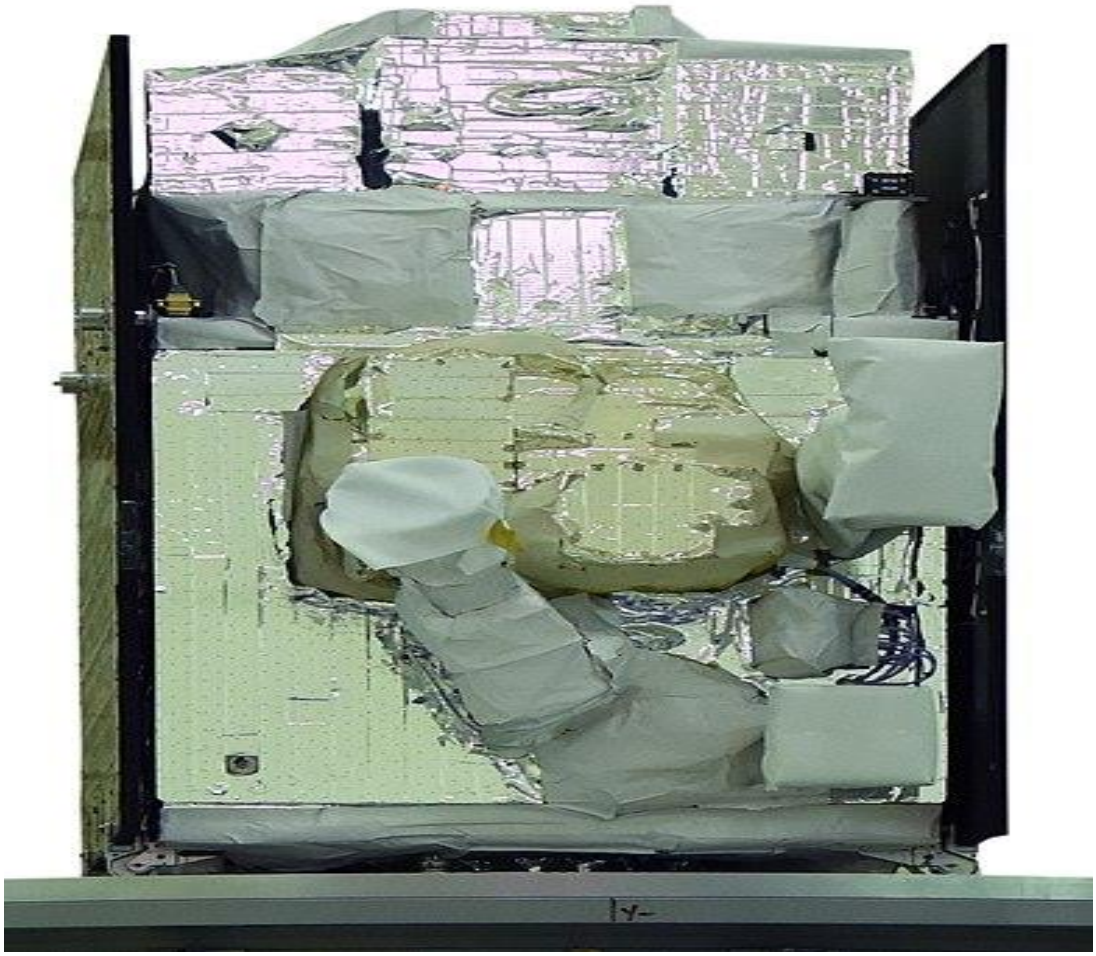
**SSLV-D1/EOS-02 MISSION**



**E:Wikipedia**

**Compiled by:**
**Dr. R. K. Shastri ( Dean R&D, Coordinator Nodal Center for IIRS/ISRO at VPKBIET Baramati)**

# Robotic Process Automation

When I was asked to write about Market Trends, I had many things to write and share with you all. To keep it simple, here I will share about one important topic which I have experienced so far in my corporate life. Also I will share an overview of the technology I work on.

Change Let's discuss a little about one of the important topics. You all know that "Change is the only Constant" and it is unavoidable. While working in industry one must learn to adapt to the change. Technology today is evolving at a rapid pace, enabling faster change and progress, causing an acceleration of the rate of change. What does this mean for you? It means staying current with emerging technologies and latest technology trends. And it means keeping your eyes on the future to know which skills you'll need to know to secure a safe job. There are many researchers who predict the industry trends into the near future. I personally look into Gartner and Forrester predictions.

Before jumping on RPA, let me tell you how I chose the technology. I remember sitting in PG Lab for hours and hours after college time. There I used to spend time learning new technologies. Automation is my favourite topic and I used to learn about automation technologies on learning platforms like Coursera, Udemy and Linkedin Learning. Those were the golden days.

Robotic Process Automation I got to know about Robotic Process Automation from Gartner's Magazine.

It is there in Gartner’s top 10 technologies (It falls under Hyperautomation). Robotic Process Automation (RPA) is a software technology that makes it easy to build, deploy, and manage software robots that emulate human actions interacting with digital systems and software. Just like people, software robots can do things like understand what’s on a screen, complete the right keystrokes, navigate systems, identify and extract data, and perform a wide range of defined actions. But software robots can do it faster and more consistently than people, without the need to get up and stretch or take a coffee break.

Software robots instead of people do repetitive and lower value work, like logging into applications and systems, moving files and folders, extracting, copying, and inserting data, filling in forms, and completing routine analyses and reports. Advanced robots can even perform cognitive processes, like interpreting text, engaging in chats and conversations, understanding unstructured data, and applying advanced machine learning models to make complex decisions.

There are many RPA tools available in the market like UiPath, Automation Anywhere, Blue Prism etc. The RPA tools are mostly Low-code or No-Code and easy to learn. I currently work on the UiPath tool in RedHat. It is a good technology to work on. Many of my friends who have completed Engineering in E&TC are working on RPA and doing well in the market.

Here is one tip for getting a good job. Personal Branding Have you ever tried googling your own name? Personal branding is the process of creating a brand identity for a person. As the name suggests, this is a brand for you. Essentially, it is how you project your brand and its values to the world and ensure that your target audience knows who you are, what you stand for, and why it’s worth choosing you over your competitors. Personal branding is not just about marketing but about being your marketer. It is about standing for yourself to command respect and confidence. LinkedIn is the platform you can use for personal branding. Many organizations check your profile on LinkedIn while hiring people


Amit Rekhawar [Alumini]
Currently RPA Developer
@Red Hat

# Electronics Industry in India

Electronics Industry in India From past few decades, the electronics sectors of India have undergone through huge ups & downs. The revolutions held has made a drastic change in electronics and various domains of India and whole world as well. Throughout these revolutions the requirement of consumers as well as business are been fulfilled. India's electronic market is popularly known for its consumption throughout the world. India is one of the largest importers of electronic goods, which are majorly offered by China. Looking towards changes taken place, from installation of 50-line manual telephone in Calcutta to use of smart phone single handedly in day-to-day life. The growth and development of electronics industry of India was crawling until the installation and setup of a computer. After that there was no looking back for Indian electronics and its cause was (1). Hindustan Computers Limited (HCL) and (2). WIPRO Information Technology Limited (WITL) as their contribution lead to huge development in India. Apart from a positive outlook, the industry underwent a severe downfall during the pandemic period. As the micro-components used in electronic devices are exported from China to India. The li. The article mentions the contribution as well as challenges of Indian electronic industry mited amount of sources were delivered under huge restrictions for its usability. The sales of top electronic companies and smart phone manufacturers had collapsed, which had major supplies to India. phenomenal

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**Key role in Indian GDP:**

Role of Electronics and Hardware Industry in India GDP growth has been The rate of employment and opportunities has been increased. The sectors on small scale contributes up to 3.4% of nation's GDP. "Electronics manufacturing industry will grow from recent US$ 75 billion in 202-21 to US$ 300 billion by 2025-26" stated by the Ministry of Electronics & Information Technology. Various research centers such as GMRT, DRDO, CEERT receives huge credit for its performance throughout the journey. Challenges faced by Electronic Sector Companies are facing problem in handling internal and external resources while meeting international standards. There was a drastic fall in photocells manufacturing capacity due to short of requirements. Software and O.S demands for higher hardware requirement and within months some devices get outdated, since software upgrades are not supported. Huge requirements of power consumption, and transmission but it can't be fulfilled due to insufficient resources and environmental restrictions. As Industry is facing severe shortage of raw materials, if the manufacturing units are been increased and developed the problem may be solved.

**Miss. S**antoshi Anil Pharate

**Student**

**TE-E & TC Engg**

# Editor's Desk

Dear Readers,

Greetings from Team E & TC Engineering,

Hope you and your family are safe. **“Tell me and I forget. Teach me and I remember. Involve me and I learn.”,** Benjamin Franklin.

The Creative minds of the Electronics and Communication department of VPKBIET have come together to present what they have always wanted to and we congratulate every student and faculty who has given their contribution. We take pride in showing you of how our very own VPKBIET’s have imaginations which spread across the horizons. We would like to thank the Management and all the staffs who have supported the **‘ELECTRONICA’** initiative and for having trust in the Editorial board by giving us full freedom to choose the contents and design for out magazine. The magazine should serve as a pillar of motivation for every other student who is yet to emerge as an Achiever and to carry the legacy of ‘Electronica’

## Thanks for your time!!

Let us know, what you think, your suggestions are highly appreciated!!!

**You can contact us at:**

monali.more@vpkbiet.org

## EDITORIAL TEAM

**Faculty:**

**Dr. B.H.Patil (HoD)**

**Mrs. More Monali U. (Editor)**