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Greater Noida
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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

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2021

ELECTRONICA

NEED OF SOCIETY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

- **Industrial IoT**
- **IoT is Reshaping the Workforce**
- **Smart Agriculture**
- **Low-Cost IoT Solutions**

VISION

To prepare students for global Competence, with core knowledge in Electronics and Communication Engineering having a focus on research to meet the needs of industry and society

MISSION

MI: To become dynamic and vigorous knowledge hub with an exposure to state of art technologies for connecting world.

M2:To provide in-depth knowledge of Electronics and Communication Engineering ensuring the effective teaching learning process.

M3:To train students to take up innovative projects in group with sustainable and indusive technology relevant to the industry and social needs.

M4: To empower students to become skilled and ethical entrepreneurs.

M5: To promote and adapt professional development in a perpetual demanding environment and nurture the best minds for the future.

PSOs

PSO-1 Engineering Knowledge: Apply Electronics mathematics, &communication industry based on same or related area. the knowledge of science and engineering to work effectively in the industry based on same or related area.

PSO-2 Design/Development of Solutions: Use their skills to work in modern electronics & communication engineering tolls, software and equipments to design solutions for complex problems in the related field that meet the specified needs of the society.

PSO-3 Individual and Team Work: Function effectively as an individual and as a member or leader of a team by qualifying through examinations like GATE, IES, PSUS, TOEFL, GMAT and GRE etc.

PEOs

PEO-1 To have excellent scientific andengineering breadth So as to comprehend, analyze, design and solve real- life problems using state-of-the-art technology.

PEO-2 To lead a successful career in industries or to pursue higher studies or to understand entrepreneurial endeavors.

PEO-3 To effectively bridge the gap between industry and academics through effective professional attitude and a desire to learn communication skill.

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OCTOBER, 2021

DR. O.P AGARWAL (MD)

Achieving success is a continuous process. It is the outcome of constant development following every setback. To be able to learn from one's mistakes, one must overcome their fear of failing. It's a priceless chance to learn from mistakes and go on. It's better to fail while working for a worthy cause than to succeed while working for the wrong one. NIET has established a unique position for itself in the private higher education market throughout the years.It offers a transparent, student-centered environment with its unique culture where one can study current technical knowledge and discover new things at the cutting edge of technological growth.

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OCTOBER, 2021

DR. NEEMA AGARWAL (AMD)

Over the past 20 years, there has been a significant increase in the number of technical and management institutes across the nation. Annually, graduates of these institutes are generally very optimistic, believing that technical courses will lead to a fulfilling career. In addition to academics, the curriculum at NIET is closely aligned with a number of contemporary themes, including communication, soft skills, and the latest technologies that businesses need. Our strategy has produced educational programmes that are pertinent to the issues and trends in leadership that will arise in the future. Highly skilled and experienced faculty members use role plays, presentations, case studies, and immersive learning experiences to make classroom learning engaging. Practical learning through industrial trips and summer training serves to further reinforce this. Pupils participate in frequent personality development and grooming programmes that help them become more confident both internally and externally and get them ready for the business world.

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OCTOBER, 2021

MR. RAMAN BATRA (EVP)

This new generation is an interesting one. Most of them are born in a world where technology has always been at the forefront. These students rely on Google, texting, social media and Wi-Fi, and they view email - not letter writing - as a formal form of communication.NIET has been helping students write their own stories since its inception. Committed to providing the best jobs by creating life-changing educational opportunities and collaborative learning environments, we have stayed at the forefront of innovation in higher education, providing the tools our students need to make them industry ready from day one and make an impact in the world.NIET has a Pyramid Finishing School, which provides training to the students according to the industry requirements giving the individual student a 360 degree in employability skills. The Institute has also made tie-ups with MNCs like Microsoft, Oracle, KPMG, ICICI Direct, Prometric and Pearson. These tie-ups not only promise to enhance student employability by manifold, but also take the lead in encouraging 'innovative' learning like never before. Taking the league forward, we have established various innovation labs to provide students hands-on experience in various modern-day technologies.I, thus, invite you to join our movement to create Corporate Citizens who become role models, wherever they go, for developing their professional career. I promise you a challenging academic experience, with an international flavor, which will truly transform your lives.

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DR. VINOD M. KAPSE (DIRECTOR, NIET)

Welcome you to the Noida Institute of Engineering & Technology, Gr. Noida. Ever Since its inception in 2001 our endeavor at NIET has been to provide excellent quality of education and training to young minds aspiring to become engineers, managers, pharmacists and technocrats.In order to achieve this goal we have established an infrastructure that compared with the best in the world. Our faculty members are highly talented and qualified. Additionally, we invite the finest minds from the industry and academia as guest lecturers. With the help of a very supportive staff we ensure a healthy learning atmosphere for our students.We motivate our students to dream big and guarantee that we inculcate de the right spirit and the necessary talent to realize their objective. We also continuously strive to instill ethical values in our wards so that they become responsible citizens of tomorrow.NIET has always stood for quality and excellence and we make every effort to constantly assess and improve ourselves. These efforts have been recognized, appreciated and awarded by prestigious educational bodies both in India and abroad.I wish you the very best as you choose to become a part of this exciting and vibrant learning community.

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OCTOBER, 2021

DR. V.K PANDEY (HOD)

It is a pleasure to head the Department of Electronics and Communication Engineering at Noida Institute of Engineering & Technology. The department offers B.Tech. and M Tech degree program in Electronics and Communication Engineering. The department has a team of well qualified, experienced and motivated faculty members to prepare the young minds of our students for global competition. Students of ECE department are also motivated and ready for ECE Industry with hands on experience on current technologies/programming languages. The graduate students of the department regularly appear in the University top positions and mostly working with good companies.The department regularly organizes various professional development activities and grooms its students with the communication classes and personality development program. Sports, co curricular and extra curricular activities takes place at institute level and students participate in various intra-college, inter-college, inter-university fests/competitions. Our students have their own music band group and won many prizes in different competitions.Department constantly works for overall growth of students and inculcate the qualities/features that are required and acceptable by Society. Faculty/students take initiative for social causes at individual level and as a team under different banners/clubs of the Institute. Turning a student in to a good and proficient citizen is the prime aim of the department.

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DR. SURYADEO CHAUDHARY (DY. HOD)

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. 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 qualify GATE 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.

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How Industrial IoT is Transforming Manufacturing

Juhi Singh

The smokestacks and steam engines of the first Industrial Revolution might seem like relics of the past, but the spirit of innovation endures. Today, industry is undergoing a new transformation, driven by the power of the Industrial Internet of Things (IIoT).

Imagine factory floors humming with intelligent machines, sensors collecting data from every corner, and real-time insights guiding operational decisions. This is the reality of IIoT, where physical assets connect to the internet, forming a vast network of data-driven intelligence.

The impact of IIoT on manufacturing is profound and multifaceted:

- Increased Efficiency: Sensors monitor equipment performance, predict failures, and enable preventive maintenance, reducing downtime and saving costs.
- Optimized Production: Real-time data analysis helps optimize production processes, leading to higher quality, reduced waste, and increased output.
- Improved Supply Chain Management: Connected devices track inventory levels, automate logistics, and enable faster, more flexible supply chains.
- Remote Monitoring and Control: Operations can be monitored and controlled remotely, improving safety and agility, especially in hazardous environments.
- Data-Driven Decision Making: Valuable insights from sensor data empower informed decision-making, leading to better strategies and improved business performance.

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IIoT isn't just theoretical; it's already transforming industries:

- Predictive maintenance in aircraft engines prevents unexpected failures, saving airlines millions.
- Smart sensors in smart grids optimize energy production and distribution, improving efficiency and sustainability.
- Connected oil rigs monitor equipment health and environmental conditions, enhancing safety and productivity.

Despite its vast potential, IIoT faces challenges:

- Security concerns: Protecting sensitive data from cyberattacks is crucial.
- Integration complexities: Integrating diverse devices and platforms into a seamless network requires expertise.
- Skilled workforce development: Preparing the workforce for the evolving industrial landscape is critical.
-

Overcoming these challenges will unlock the full potential of IIoT. Manufacturers that embrace IIoT are poised to lead the way in a new era of industrial competitiveness and innovation.

The future of Industrial IoT is bright, promising a more efficient, productive, and data-driven manufacturing landscape. It's a revolution not just in technology, but in the very way we think about and manage industrial operations.

This article provides a brief overview of IIoT. Feel free to suggest specific areas you'd like me to delve deeper into, such as specific applications, technologies involved, or the future of IIoT.

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healthcare IoT: Revolutionizing Medicine from the Inside Out

Aditya Ranjan

The stethoscope, once a symbol of medical innovation, is quickly being joined by a new wave of digital devices: smartwatches, ingestible sensors, and connected medical equipment. This interconnected web of devices, known as Healthcare Internet of Things (H-IoT), is transforming the way we deliver and experience healthcare.

H-IoT empowers patients to become active participants in their health management. Imagine:

- Diabetics continuously monitoring their blood sugar with wearable sensors and receiving personalized medication adjustments.
- Cardiac patients remotely monitored for arrhythmias, allowing for early intervention and preventing emergencies.
- Individuals with chronic conditions managing their health at home with connected devices, reducing hospital readmissions and improving quality of life.

H-IoT extends its impact beyond individual patients, improving healthcare systems as a whole:

- Remote patient monitoring eases the burden on hospitals and allows for proactive care, reducing costs and improving outcomes.
- Real-time data analysis helps predict disease outbreaks, optimize resource allocation, and personalize treatment plans.
- Connected medical devices streamline hospital operations, improving efficiency and staff productivity.

Despite its promise, H-IoT faces challenges:

- Data privacy and security are paramount concerns, requiring robust measures to protect sensitive patient information.
- Interoperability across diverse devices and platforms is crucial for seamless data exchange and analysis.
- Ethical considerations surrounding data ownership and algorithmic bias need careful attention.

Addressing these challenges paves the way for a future where H-IoT plays an even greater role:

- Telemedicine will become commonplace, bringing specialized care to remote areas and reducing travel burdens.
- Precision medicine will be further personalized, tailoring treatments to individual patients' unique needs.
- Preventative healthcare will be revolutionized, with H-IoT devices detecting health risks early and enabling preventative interventions.

H-IoT is not just a technological trend; it's a paradigm shift in healthcare. By empowering patients, streamlining systems, and enabling data-driven insights, H-IoT holds the potential to create a healthier, more efficient, and personalized healthcare experience for all.

This article provides a glimpse into the world of H-IoT. If you'd like to delve deeper, I can explore specific applications, discuss ethical considerations, or analyze the future of H-IoT in different healthcare sectors. Just let me know!

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How IoT is Reshaping the Workforce

Shobhna Kumari

The Internet of Things (IoT) is weaving its way into every aspect of our lives, and the workforce is no exception. This interconnected network of devices is poised to significantt impact employment opportunities, demanding new skills while automating others. Let's explore the multifaceted ways IoT is transforming the workforce, focusing on job creation, automation, and the skills needed to thrive in this evolving landscape.

While some fear mass job displacement due to automation, IoT is also creating entirely new job categories. Here are some areas where we can expect growth:

- IoT Specialists: Designing, deploying, and managing complex IoT networks will require dedicated professionals with expertise in sensors, data analysis, and security.
- Data Analysts and Scientists: Extracting insights from the vast data generated by connected devices will necessitate skilled individuals who can interpret trends, identify patterns, and make data-driven decisions.
- Cybersecurity Professionals: Securing connected devices and protecting sensitive data will be paramount, demanding cybersecurity experts adept at safeguarding IoT ecosystems.
- Application Developers: Building user-friendly interfaces and applications for interacting with IoT devices will require skilled developers across various platforms and devices.

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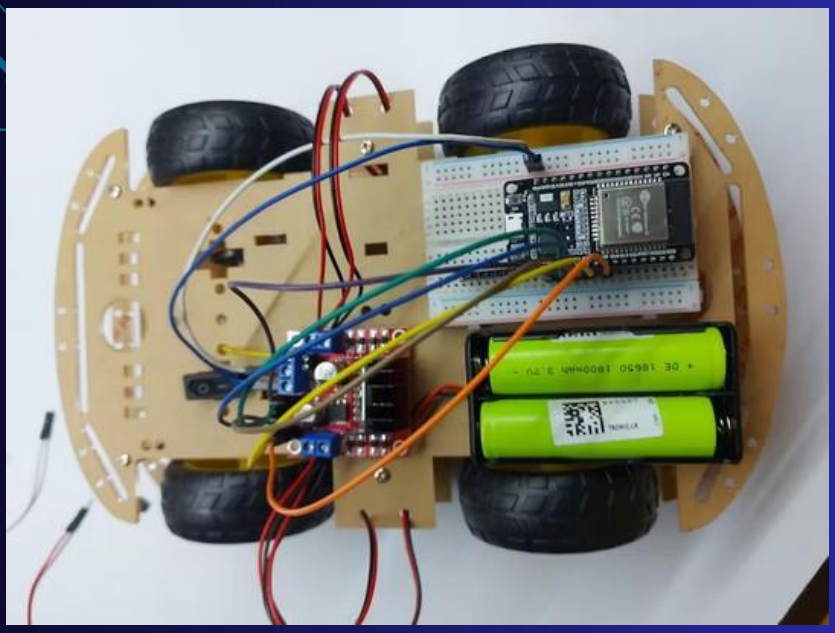

IoT-driven automation will undoubtedly impact certain jobs, particularly those involving repetitive tasks. However, automation is not synonymous with job losses. Instead, it can:

- Augment Human Capabilities: Repetitive tasks can be automated, freeing up human workers to focus on higher-level skills like problem-solving, creativity, and critical thinking.
- Improve Efficiency and Productivity: Automation can streamline processes, leading to increased output and potentially creating new jobs in areas like quality control and oversight.
- Open Up New Possibilities: By automating mundane tasks, workers can take on more complex roles, pushing the boundaries of innovation and driving further advancements.

To thrive in the IoT era, the workforce needs to equip itself with a new set of skills:

- Digital Literacy: Understanding how technology works and interacting with connected devices will be essential.
- Data Analysis: The ability to analyze and interpret data from various sources will be crucial for making informed decisions.
- Problem-Solving and Critical Thinking: Automation will require workers to solve complex problems and think critically to adapt to changing situations.
- Collaboration and Communication: Effective communication and collaboration will be key in navigating the interconnected world of IoT.
- Lifelong Learning: The rapid pace of technological change necessitates a mindset of continuous learning and adaptation.

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How Smart Agriculture is Feeding the Future

Piyush

Imagine fields teeming with sensors whispering to satellites, robots precisely tending crops, and irrigation systems responding to real-time soil moisture data. This isn't science fiction; it's the exciting reality of Smart Agriculture, a revolution where IoT sensors and automation are optimizing crop yields, water usage, and resource management. Let's delve into the fertile ground of this technological revolution, analyzing its environmental and economic impact.

Myriad sensors blanket the smart farm, acting as the eyes and ears of the operation. They collect a wealth of data:

- Soil moisture levels: Sensors tell farmers exactly how much water each plant needs, eliminating wasteful overwatering and saving precious resources.
- Nutrient deficiencies: Sensors detect nutrient imbalances in the soil, allowing for targeted fertilization, reducing fertilizer waste and environmental pollution.
- Pest and disease detection: Early detection is crucial for crop health. Sensors can identify pests and diseases at their onset, enabling swift action and minimizing crop losses.
- Weather monitoring: Real-time weather data helps farmers prepare for and mitigate the impact of adverse weather events, protecting their crops and maximizing yields.

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The economic benefits of smart agriculture are substantial:

- Increased crop yields: Optimized growing conditions and pest control lead to higher yields, improving food security and farmer income.
- Reduced costs: Savings on water, fertilizer, and labor contribute to increased profitability for farmers.
- Improved market access: Real-time data helps farmers make informed decisions, leading to better crop quality and improved market access.
- New job opportunities: The smart agriculture sector creates new jobs in areas like data analysis, robotics, and sensor technology.

The Future is Smart: Cultivating a Sustainable Tomorrow

Smart agriculture is not just a technological trend; it's a necessity for a future facing growing populations, water scarcity, and climate change. By harnessing the power of IoT sensors and automation, farmers can increase yields, conserve resources, and ensure food security for generations to come. As this technology continues to evolve, we can expect even more exciting innovations, paving the way for a sustainable and abundant future for agriculture.

This article provides a broad overview of smart agriculture. If you'd like to delve deeper, I can explore specific technologies, discuss the challenges faced by farmers adopting smart practices, or analyze the impact of smart agriculture in different regions around the world.

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How Low-Cost IoT Solutions Empower Individuals and Communities

Deepak Chander
2nd Year

Imagine a city where traffic lights adjust to real-time congestion, waste collection is optimized based on sensor data, and public safety is bolstered by interconnected cameras. This is no longer science fiction; it's the vision of smart cities, powered by the revolutionary potential of 5G technology.

From Niche to Necessity: The Rise of Affordable IoT

The cost of sensors, microcontrollers, and communication modules has plummeted, making IoT development more accessible than ever. This opens doors for:

- DIY enthusiasts and citizen scientists: Individuals can now build their own environmental monitoring systems, track personal health data, or even create smart home solutions on a budget.
- Local communities: Villages can deploy low-cost sensors to monitor water quality, track agricultural yields, or manage local resources more effectively.
- Social entrepreneurs: Affordable IoT enables the development of innovative solutions for social good, addressing issues like healthcare access, disaster preparedness, and environmental sustainability.

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Low-cost IoT is fostering collective action:

- Precision agriculture: Sensor-based irrigation systems optimize water usage and improve crop yields, benefiting entire communities.
- Environmental monitoring: Communities can track air quality, water pollution, and deforestation, raising awareness and promoting sustainable practices.
- Disaster preparedness: Early warning systems built with low-cost sensors can save lives and livelihoods by alerting communities to impending dangers.

Challenges and the Road Ahead:

Despite the immense potential, challenges remain:

- Digital literacy and access: Bridging the digital divide is crucial to ensure equitable access to the benefits of low-cost IoT.
- Data security and privacy: Protecting sensitive data collected by connected devices requires robust security measures and ethical considerations.
- Sustainability and e-waste: Responsible disposal of used devices is essential to minimize environmental impact.

Conclusion: A Brighter Future, Powered by the People

Low-cost IoT solutions are democratizing innovation, empowering individuals and communities to solve local challenges and build a brighter future. By addressing the existing hurdles and fostering responsible development, we can unlock the full potential of this technology for a more inclusive, sustainable, and connected world. This article provides a glimpse into the world of low-cost IoT. If you'd like to delve deeper, I can explore specific examples of community-driven solutions, discuss the role of open-source platforms, or analyze the long-term impact of this technology on different sectors.