Future Prospective of Mechanical Engineering

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Core Engineering Disciplines Cannot Be Replaced By AI, Curriculum Revamp Not Needed: Director, IIT Mandi

- Artificial Intelligence (AI) is not at a stage where it can really educate students and core engineering discipline cannot be replaced by it, according to Indian Institute of Technology (IIT), Mandi Director Laxmidhar Behera. The curriculum in the engineering colleges need not be revamped with the advent of AI because the new technologies cannot do research, he added.
- "I don't think as of now Artificial Intelligence (AI) or associated tools has attained a stage where it can really educate our students in terms of scientific concepts as well as scientific possibilities. I don't think AI has enough of that now, because we ourselves don't understand our own cognitive processes.
- "For example, we do not have an answer about why one person is able to understand math and why other person doesn't. So how can we create a system when we very poorly understand our own cognitive processes?," Behera told PTI in an interview.
- The director who is known for his contribution to areas such as intelligent systems and control, vision-based robotics, warehouse automation and brain-computer-interface, said "ChatGPT is a good innovation but it is as dumb as possible".
- "It doesn't understand the concept. It just gathers the information from voluminous data," he said.
- Amid an on ongoing debate about how education and teaching and learning will have to be reimagined in wake of the AI boom, Behera said none of the AI system are innately cognitive, rather they depend on their huge architecture and huge database to make things possible.
- "No we do not have to change our curriculum completely because that will not be prudent on our part. Even with AI we will still need good engineers who have good concepts. I don't think AI would do all these things. Without any concepts of structural engineering, how they can the engineers build a bridge or how they can build a 100 storied apartment that is earthquake-resistant.
- "AI can probably give a finishing touch, you know, making things much better, this and that. But the core engineering discipline cannot be replaced by AI or AI technology. So this is a hype. I cannot tell you how long this will continue, but I am pretty sure every phase has its own end," he said.
- Talking about expansion plans for IIT Mandi, Behera said the institute plans to increase the faculty strength to over 300 and student strength to over 5,000 in the next five years.
- "With the infrastructure firmly in place, the institute plans to increase the faculty strength to over 300 and student strength to over 5,000 in the next five years. Along with this, the institute plans to build a hostel for students from Economically Weaker Sections (EWS), new hostel blocks for 1,500 students, an academic block, and a lecture hall complex in the near future with the financial support of the Ministry of Education through a HEFA loan of ₹ 333 crores.
- "In the past year, IIT-Mandi has started four new BTech and BS programmes in Material Science and Engineering; General Engineering; Microelectronics and VLSI; Mathematics and Computing and Chemical Sciences. We have also started joint degree programme with other national institutes," he said.

Reference: *https://www.ndtv.com/education/core-engineering-disciplines-cannot-be-replaced-by-ai-curriculum-revamp-not-needed-iit-mandi-5179446*

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TOI dt 17-03-2024

Job offers rising for core engg courses

Non-IT Firms Offer Campus Placements

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Chennai: Students of core engineering branches such as mechanical, civil, electrical and electronics are seeing a rise in campus placements with pay packages from ₹3lakh to ₹18.5lakh a year.

From Anna University's four campuses, including College of Engineering (CEG), Guindy, and Madras Institute of Technology (MIT), Chromepet, 40% of students were placed in core sector companies this year.

Karpaga Madhavan, a final year mechanical engineering student from CEG, got an offer from an aerospace company. "Though the starting salary is less compared to IT companies, it provides job stability. Year by year our value will increase unlike in IT companies," he said. About 80% of students from his class have been placed this year.

"More students are interested in core engineering jobs compared to previous years," said Hariprakash, a final year electrical and electronics engineering student from CEG. He has been placed in a petroleum company. "Auto, manufacturing, construction, and infrastructure management companies are hiring more. There is a revival of interest in core engineering students," said K Shanmuga Sundaram, director, Centre for University-Industry Collaboration (CUIC), Anna University. Ashok Leyland, TVS, Brakes India have visited our campus after many years, he added.

"Students used to prefer IT jobs due to better pay packages. However, core sector companies are offering to sponsor PG courses, international opportunities," said V E Annamalai, principal of SSN College of Engineering. The college has received placement 167 offers, 20% more than last year.

"Lots of new companies have come to our campus this year. Companies working in robotics, aerospace engineering are trying to hire more. We expect the demand for core engineering branches to go up," said Abhay Meganathan, vice-chairman, Rajalakshmi Group of Institutions. "Global companies in energy, semiconductors, defence and automotive are making a beeline to set up R&D, manufacturing units in India, and are dialling up hiring from campuses across disciplines," said Ramkumar Ramamoorthy, partner at Catalincs, a tech growth advisory firm.

"We are beginning to see some green shoots in demand from the IT industry, especially around large cost take-out deals. There is also widespread belief that that pent-up discretionary spend will become a reality in the coming months because of which companies have started hiring from campuses and recruiting experienced professionals," Ramamoorthy said.

BOOMING FIELD

DEMAND | Revival of demand for mechanical, EEE, electronics and instrumentation, civil engineers in campus placements

JOB ROLES | engineering associate, training project engineer, entry-level engineer, systems engineer

PAY PACKAGE | Students receive pay package from ₹3.5lakhs a year to ₹18.5lakhs a year

Colleges | Number of core companies visited this year (last year) – **Job offers (increase in % compared to last year)**	
Anna University's four campuses	**129* (203) 795** (10% more)
SSN College of Engineering	**56 (50) | 167** (20% more)
Rajalakshmi Engineering College-81 (69)	**219** (17% more)

*Campus placements will go on till the end of April

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‘India can’t be tech global leader without core engineering courses’

The All India Council for Technical Education (AICTE) is working to strengthen the core engineering courses—civil, mechanical and electronics—by breaking the myth that only students from IT sector or computer engineering background are getting the big fat salary package as compared to core engineering. AICTE chairman Prof TG Sitharam said this at Lucknow University here on the third and final day of an educational summit on Saturday. He said if India has to develop and progress, it is the core engineering sector that has to play a major role.

“To boost admissions in core engineering courses, including civil, mechanical and electronics, AICTE will now allow students pursuing these programmes flexibility to also pursue a minor degree in any emerging area,” he said.

“India cannot become Vishva Guru (global leader) in technology without core engineering courses. Therefore, we have come up with some schemes to promote core engineering,” Prof Sitharam added.

Placement portal for students of semi urban, village, tribal areas

To help engineering students of semi urban, village and tribal area with good placement opportunities, the AICTE has developed a placement portal that will emerge as a powerful tool to help bridge the gap between urban and rural areas in terms of access to employment opportunities. He talked about the success of the internship portal with 2 crore students registered across all streams and highlighted initiatives like Ek Bharat Shreshtha Bharat (EBSB) by urging students to study in various locations of India to see real Bharat.

‘Need to promote collaboration’

Prof Sitharam emphasised the need to promote collaboration between institutions to promote concepts like dual degrees and twin programmes. He talked about the government initiative i.e. I-STEM (Indian Science, Technology and Engineering Facilities Map), an online national portal aiding researchers in locating specific facilities for their R&D work. He urged institutions to be financially independent, stressing self-fund generation. He highlighted key achievements in higher education, including foreign collaborations with up to 1600 foreign experts sharing their insights and expertise in Indian higher educational institutes, India becoming the largest patent-filing country due to reduction of patent fee and the success of indigenous startups and reaching a market capital of 500 billion USD in startup. He said many Indian startups had become unicorns.

Reference: *https://www.hindustantimes.com/cities/lucknow-news/india-can-t-be-tech-global-leader-without-core-engineering-courses-101708192430674.html*

5

India plays a key role in advanced manufacturing: Chandra

Tata Sons chairman N Chandrasekaran has said that new global supply chain ecosystems are emerging, and India is playing a crucial role in advanced manufacturing. "Geopolitical challenges continue to alter established supply chains, and companies are rebalancing their supply chains to address both resilience and efficiency. New global ecosystems are being created, with India playing an important role in advanced manufacturing," Chandrasekaran, who is also TCS chairman, wrote to tech major's shareholders.

	Following the pandemic, which resulted in supply chain shocks, there was an economic slowdown, especially in developed markets. "While initial signs of stability began to emerge, military conflicts have further intensified this year and continue to impact global supply chains," Chandrasekaran said. "After two years of recessionary fears, persistently high inflation, and unprecedented monetary tightening, the global macro-outlook now looks relatively better, with improving growth, disinflation, and monetary easing in sight. Across industries globally, multiple mega trends are shaping the priorities of businesses: AI, new energy, supply chain, and talent," he wrote in the letter. Chandrasekaran said GenAI would impact almost every sector as well as country going forward. "Enterprises have already invested in cloud, data infrastructure, and large processing power, which will aid AI/GenAI. GenAI will not only improve productivity, but also create impact we hitherto have not seen or imagined." In FY24, TCS CEO K Krithivasan received a compensation of Rs 25.3 crore, making him one of the lowest-paid CEOs among his peers in the Indian IT sector. His predecessor, Rajesh Gopinathan, drew Rs 29.2 crore as total remuneration for FY23. In comparison, Infosys CEO Salil Parekh and Wipro's new CEO Srini Pallia earned Rs 56 crore and Rs 50 crore respectively. TCS COO N Ganapathy Subramaniam, who is set to retire in May, received a remuneration of Rs 26 crore in FY24 - an 8.2% increase compared to the year before. The median remuneration of employees at TCS increased by 10.8% in FY24. The average annual salary hike was from 5.5% to 8%, with top performers receiving double-digit increments in India. However, during the last fiscal, the total increase was between 7-9% after accounting for promotions and other event-based compensation revisions. ***Reference***: *https://timesofindia.indiatimes.com/business/india-business/india-plays-a-key-role-in-advanced-manufacturing-chandra/articleshow/109990034.cms*
6	 ***Reference***: *https://www.linkedin.com/posts/primus-partners-india_padmabhushan-digital-indiaat2047-activity-7163153816673071106-_xUx/?utm_source=share&utm_medium=member_ios*
7	**What is the future of Mechanical Engineers in India?**

Introduction

The field of mechanical engineering has been instrumental in shaping the industrial landscape of India. With its wide-ranging applications, mechanical engineering plays a crucial role in sectors such as manufacturing, automotive, aerospace, energy, and more. As technology continues to advance, it is natural to wonder about the future prospects of mechanical engineers in India. This article explores the current landscape, challenges faced, and the future outlook for mechanical engineers in the country.

Current Landscape of Mechanical Engineers in India

Growth of Mechanical Engineering Industry

Over the years, the mechanical engineering industry in India has witnessed significant growth. With the country's push towards manufacturing and innovation, there has been an increasing demand for skilled mechanical engineers. Industries such as automobile manufacturing, energy production, and infrastructure development have been major contributors to this growth.

Job Opportunities

Mechanical engineering offers a wide array of job opportunities in various sectors. From design and development to maintenance and quality control, they are involved in every stage of product lifecycle. Additionally, there is a rising demand for them in emerging fields like renewable energy, robotics, and automation.

Emerging Technologies

Advancements in technology have a profound impact on the field of mechanical engineering. With the rise of Industry 4.0 and digitalization, they are expected to adapt to new technologies such as artificial intelligence, internet of things (IoT), and additive manufacturing. These emerging technologies are reshaping industries and creating new avenues for them to explore.

Challenges Faced by Mechanical Engineers

Skill Gap

One of the major challenges faced by them in India is the skill gap. Rapid technological advancements require engineers to constantly upskill and stay updated with the latest developments. Bridging the gap between industry requirements and academic curriculum is crucial to ensure that they are equipped with the necessary skills.

Automation and Job Security

Automation has transformed various industries, and the field of mechanical engineering is no exception. While automation brings increased efficiency and productivity, it also raises concerns about job security. To thrive in the future, mechanical engineers must embrace automation and focus on developing skills that complement these technological advancements.

Global Competition

In a globalized world, mechanical engineers in India face competition from their counterparts in other countries. To remain competitive, Indian mechanical engineers need to continuously enhance their skills and knowledge to meet international standards. They must stay updated with the latest trends and technologies to contribute to the global market and attract potential employers.

Future Prospects for Mechanical Engineers

Industry 4.0 and Digitalization

The future of mechanical engineering lies in Industry 4.0 and digitalization. As the world becomes increasingly connected, mechanical engineers will play a vital role in integrating digital technologies into traditional manufacturing processes. Concepts such as smart factories, automation, and data analytics will drive the next phase of industrial revolution, and mechanical engineers will be at the forefront of implementing these transformative changes.

Research and Development

	Research and development (R&D) will be a key area for mechanical engineers in the future. The need for innovation and breakthrough technologies will drive the demand for engineers who can push the boundaries of traditional engineering practices. By engaging in R&D activities, they can contribute to the development of new materials, energy-efficient systems, and sustainable solutions. **Diversification of Roles** Mechanical engineers will have opportunities to diversify their roles and explore interdisciplinary fields. With the convergence of different engineering disciplines and the integration of technology, they can branch out into areas such as mechatronics, robotics, renewable energy, biomedical engineering, and more. This diversification will open up new avenues for career growth and allow engineers to apply their skills in innovative ways. Education and Skill Development of Mechanical Engineers **Curriculum Enhancement** To prepare mechanical engineers for the future, there is a need to enhance the existing curriculum. The education system should focus on providing a strong foundation in core mechanical engineering principles while incorporating courses on emerging technologies and interdisciplinary subjects. By updating the curriculum, educational institutions can equip graduates with the skills needed to excel in a rapidly evolving industry. **Emphasis on Interdisciplinary Skills** In addition to core mechanical engineering knowledge, there is a growing need for interdisciplinary skills. Mechanical engineers should develop competencies in areas such as programming, data analysis, project management, and communication. These skills will enable them to collaborate effectively with professionals from different disciplines and tackle complex problems in multidisciplinary projects. **Lifelong Learning** The future of mechanical engineering requires a commitment to lifelong learning. Engineers must embrace a mindset of continuous improvement and stay updated with the latest advancements in their field. Professional development programs, online courses, and industry certifications can help them acquire new skills, stay relevant, and adapt to evolving industry demands. **Conclusion** The future of mechanical engineers in India is promising, with ample opportunities for growth and innovation. While there are challenges to overcome, such as the skill gap and global competition, they can thrive by embracing emerging technologies, focusing on research and development, diversifying their roles, and continuously enhancing their skills. With the right education, commitment to lifelong learning, and adaptability, mechanical engineers in India can play a vital role in shaping the future of the industry. ***Reference**: https://manufast.in/what-is-the-future-of-mechanical-engineers-in-india/?trk=article-ssr-frontend-pulse-lite_little-text-block*
8	**How Mechanical Engineers Shape Robotics in Diverse Industries** Robotics engineering is a captivating field that blends elements of electrical, mechanical, and computer engineering. Robotics engineers play a crucial role in creating robotic systems that can perform a wide range of tasks. In this comprehensive guide, we will delve into the world of robotics engineering, focusing particularly on the contributions of mechanical engineers to this dynamic domain.

	Understanding Robotics Engineering At its core, robotics engineering involves the design, construction, and engineering of robots. Whether it's exploring distant planets or optimizing factory processes, robotics engineers are at the forefront of innovation. This multidisciplinary field encompasses electrical, mechanical, and computer engineering, requiring engineers to work on every aspect of a robot, from its initial design to the development of control software. ***Key Responsibilities of Robotics Engineers*** Robotics engineers have diverse responsibilities across various industries: **Automotive Sector:** In the automotive industry, robotics engineers design robotic arms for assembly lines, enhancing efficiency and precision in manufacturing processes. **Aerospace Industry:** Robotics engineers contribute to space exploration by developing robots for extraterrestrial missions. These robots assist in data collection, maintenance, and exploration of celestial bodies. **Manufacturing Sector:** Robotics engineers play a crucial role in optimizing production lines in manufacturing plants. They ensure seamless operations and enhance overall efficiency. **Defense Applications:** Military applications of robotics involve specialized robots for surveillance, bomb disposal, and reconnaissance. Robotics engineers ensure these robots perform critical tasks safely and effectively. **Medical Field:** Robotics plays a vital role in minimally invasive surgeries. Engineers design surgical robots that enhance precision, reduce patient trauma, and improve surgical outcomes. *Key Skills of Mechanical Engineers in Robotics Engineering* Mechanical engineers bring several key skills to the field of robotics: **Mechanics and Dynamics:** Understanding how mechanical components interact is crucial. Mechanical engineers ensure smooth movement of robotic arms, joints, and other components. **Thermodynamics:** Managing heat dissipation and ensuring energy efficiency are vital for optimal robot performance. **Materials Science:** Selecting the right materials is essential for the durability and functionality of robotic systems. **CAD/CAM:** Computer-aided design and manufacturing tools help in creating precise components for robots. ***Future Prospects of Robotics Engineering*** The future of robotics engineering is promising. As technology advances, the possibilities in this field continue to expand. Mechanical engineers will continue to shape the world by designing robots that enhance productivity, safety, and the overall quality of life. *Conclusion* In conclusion, robotics engineering is a dynamic and multifaceted field where mechanical engineers play a pivotal role. Their expertise drives innovation, making robots an integral part of our modern world. ***Reference**: https://www.analyticsinsight.net/latest-news/how-mechanical-engineers-shape-robotics-in-diverse-industries*
9	**Transitioning From Mechanical Engineering to the IT Field** Switching from a mechanical engineering job to a role in IT can open many new doors. Mechanical engineers have solid skills in solving problems, managing projects, and thinking analytically, which are also very useful in IT. To switch careers effectively, you should evaluate your skills, decide which IT jobs you're interested in, and learn the technical skills you need for those jobs. It's also important to meet people who work in IT and get involved in the industry to learn more and make

professional connections. Getting ready for this change means carefully planning to meet the needs of the ever-changing IT job market.

Assessing Your Transferable Skills

Look closely at what you know from mechanical engineering and see how you can use these skills for IT jobs. Mechanical engineers are good at solving problems, making sense of complex information, and managing projects. These abilities are just as important for working in IT. If you're skilled with computer-aided design (CAD) tools, you'll have a good grasp of how software and systems are built. The step-by-step way you fix and make mechanical systems better can be applied to fixing IT issues too. Knowing about materials and how things move can help when you work with the hardware side of IT, like setting up networks and managing data centers. When you break down your skills and how carefully you work as a mechanical engineer, you'll find it easier to get the hang of working in the diverse world of IT. To make it even clearer, imagine you're great at using CAD software. This means you can see how technology pieces fit together, which is super helpful when you want to understand complex software in IT. Also, since you know how to look at a problem step by step as an engineer, you can use this to figure out computer issues. For example, if a network goes down, you can trace the problem back to its source, just like you would find a fault in a machine. So, as a mechanical engineer wanting to get into IT, think about how your knack for details and structured thinking can make you stand out.

Exploring IT Career Pathways

After recognizing the skills you can carry over, it's smart to look at different IT jobs that fit with your experience in mechanical engineering. When you take a close look at the tech world, you'll find many specialized areas. Each one has its own set of skills and career paths. For example, if you've worked in mechanical engineering, you might be good at hardware engineering. This is because it uses your knowledge of how things are built and how heat works. You might also do well in robotics and automation, as these areas use what you know about movement and materials and combine it with computers. And if you've worked with data and simulations, you'll be prepared for IT jobs that work with large amounts of data and make predictions. By carefully picking where to focus, you can make the most of the skills you already have as you move into a tech career.

Building Your IT Skill Set

If you're in mechanical engineering, it's crucial to also be skilled in IT. Start with the basics like understanding how computers work, which includes learning about data organization, step-by-step problem solving, and the different ways to write computer programs. It's really important to know how to code well in a popular language, for example, Python or Java, which helps you solve a wide range of problems. Additionally, if you learn about managing databases and using SQL, you'll be able to work with big sets of data. This is especially useful in areas that use a lot of data, such as when you're simulating fluid movements or analyzing the strength of materials. Being familiar with how software development teams work together, using methods like Agile or Scrum, is also beneficial for teamwork in IT. And don't forget about cybersecurity—knowing how to protect your digital work is becoming more and more important as everything gets connected. In short, if you're a mechanical engineer, boosting your IT skills will make you much more capable and adaptable. You'll be able to work with big data, be a team player in software projects, and keep your work secure.

Networking and Industry Engagement

If you're a mechanical engineer looking to move into the IT field, it's smart to start by using the contacts you already have. Make a list of the people you know and think about how they could help you learn about IT. Focus on those who know a lot about the industry. Also, make sure to join groups and forums that are all about IT, where you can meet new people who can give you advice, tell you

about job openings, or recommend you for positions. Getting involved in these groups and staying active is key. It's not enough to just show up once; you need to keep participating and building relationships. This way, you'll stay up-to-date on what's happening in IT and be in a better position to find the right job. Remember, it's about making connections that help both you and the people you meet. For example, if you know someone who works in IT, ask them to introduce you to more people in the field or to include you in relevant discussions. You could also go to meetups or conferences related to IT to learn more and meet potential employers. By being proactive and thoughtful about the way you network, you'll set yourself up for a successful career change.

Preparing for the Job Market

Getting ready for a career in IT means more than just making connections. It's crucial to learn the right technical skills. If you want to work in IT, you should steadily build your knowledge in areas like coding, building software, analyzing systems, and managing databases. Taking structured classes, earning certifications, or studying on your own can be very helpful. When you look at job ads, you'll see what skills are in demand and what the industry is looking for. This helps you decide what to learn. It's also important to understand how to manage projects and work with teams in IT, which is often done using agile methods. Showing that you can actually apply what you've learned, maybe by working on real projects or helping out with free software online, will impress employers and give you an edge in a tough job market.

Conclusion

To wrap things up, if you're a mechanical engineer looking to get into the IT industry, here's what you need to do. First, figure out what skills you already have that can be used in IT. This might include problem-solving or project management. Then, take a look at the different jobs in IT to see which one fits you best. You'll need to learn some new tech skills, so be ready to study and practice. Talking to people who already work in IT is a smart move. They can give you tips and might even know about job openings. Knowing what skills are in demand will help you focus your learning.

If you plan carefully, your background in engineering can give you an edge, making you a great addition to any IT team. For example, your knowledge of complex systems in engineering could make you great at understanding computer networks. If you're not sure where to start with learning new tech skills, there are plenty of online courses on platforms like Coursera or edX that can help you with coding, data analysis, or cybersecurity. Remember, this is a big step, but with the right approach, you can make a successful move into the IT field.

***Reference**: https://www.discoverengineering.org/transitioning-from-mechanical-engineering-to-the-it-field/*

10

India can be a global manufacturing hub, must adopt the newest technologies to be competitive: Siemens

We have been in India for more than 157 years…the key thing is that India is the IT (information technology) hub of the world and can very soon also be a manufacturing hub of the world. Hannover Messe fair is all about IT and OT (operational technology) this year and how to bring this together; India is the perfect place to do so. What we need for that is an educated young workforce, that is absolutely a tick. The second one is that the infrastructure is in place, that's happening in India pretty fast at the moment. If we combine those and then really see the investment in semiconductors, electronics, etc, India can be and will be the place to be.

When I spoke to you before COVID, when you were expanding the digital business, you had said that you were looking to make in India for the world. Now with your AI initiatives, do you see an opportunity in tapping Indian talent?

Neike: Some of the largest numbers of our software developers are in India; our biggest software development environment is in Pune. We have all of the different elements – electronics, PLM

(product lifecycle management), CAD (computer-aided designs) system – all of our products sitting together. Seeing how AI is going to be used, it's going to make products for the world. Not only physical products but also software products. I see that India can be used to do that. As we build new manufacturing environments…we will have to invest quite a bit in AI and the right place to do this is in India to make sure that this gets adopted.

India is a price sensitive market and right now the private sector still seems a little jittery about going ahead with big capex commitments. Given this environment, how keen do they seem to adopt new technologies?

Neike: India has always been very open to technology, but India is very broad. It's not a country, it's a continent and it is extremely advanced. Some of them are very careful about how to move forward. And what we need to do is to find how we can make it less capex intensive and how can we make it easier for the SME (small and medium enterprises) market. While the big companies are rushing for it, the small ones need to adopt the concept.

Must Read | India is taking off, there's opportunity in expanding AI, industrial metaverse solutions to SMEs: Siemens CEO

Sunil Mathur: Indians are natural and digital natives. Digitalisation comes naturally to us. It will take some time for industries to realise the benefits of it. But the moment they see the potential, they will adopt. I think it will happen faster than we actually expected it to. The private sector capacity utilisation has gone up to 80 per cent plus. They also see consistency coming ahead, stability coming ahead. So I think the private capex will now kick in. In the next couple of months, a couple of years, it will start kicking in. But it takes time as when they start looking at capex, they start designing their products and systems. That's when they start talking to us. And they want to know how we can help them. We are having those conversations with many of them; these are serious conversations.

Your CEO also spoke about the opportunity in the SME space in India for the adoption of new technologies. How are you hand holding them to help them adopt AI and digital offerings?

Mathur: It starts with the supply chain; it is in my interest to start working with my supply chain to make it more efficient and sustainable. If I can help my suppliers be more flexible in their manufacturing, I can become more efficient because my cycle times for predicting demand reduce. We go and talk to our customers to find their biggest pain points; then we go and tackle that problem.

Which sectors are the early adopters?

Neike: The first to adopt will be the ones which have big capex plans; they are using it. I mean, this is semiconductors, this is electronics, this is big pharma and chemicals. But I see others like food and beverages, cement and other industries, which are dependent on being efficient, also follow from a sustainability point of view.

Mathur: The building space is looking at energy efficiency very carefully. Food and beverage, pharmaceuticals, chemicals, steel and cement are the other industries that are really looking at it.

What is the investment plan for digital and AI going ahead?

Neike: We invest, in general, more than euro 6 billion on R&D in Siemens, and a large part is being moved forward. We've been continuously investing, for example, also in India.

When you look at India, do you see any talent gap when we talk about newer technologies like AI?

Neike: The good thing about India is because it's such a learning-oriented culture, they pick up the skills, and India picks up the skills very fast. What is important for us, and we've been investing for years now, is base training.

Mathur: We have a big advantage – we have the global pool of talent sitting in India and we can tap that pool to address my customers in India as well.

When you look at an emerging and fast-growing market like India, what are the challenges?

	Neike: Like always, when you go fast, you need to make sure you are putting the right bets. I think the one thing India has to make sure is that it leaps across technologies. So instead of copying what has been done in the past, adopt the newest technologies in order to be really competitive in the world. **What would be your advice for the government of India for policy and regulatory framework to create an enabling environment for Indian companies to adopt digital and AI?** **Neike:** I am not going to talk about consumers because we're mainly on the business side of things. The more we can actually exchange industrial data, infrastructure data, and be able to train the AI models on it, the better. So anything which enables us to basically learn from what is hidden as treasures within all of this manufacturing and infrastructure environment. And if any government, not only the Indian government, can help us unlock this potential, I think that would be great. **Mathur:** I don't think there are any policy gaps. I think the policymakers are evolving also. They're seeing as the industry picks up, as the issues come to the table, the policymakers are open to it. They are listening to the industry and supporting it. Cyber security is a critical concern because manufacturers are concerned about data; the government is addressing that. Standards and regulations is another complex issue; none of them can be seen in isolation only for India. (The reporter is at Hannover Messe 2024 upon the invitation of Siemens.) ***Reference**: https://www.moneycontrol.com/news/business/india-can-be-a-global-manufacturing-hub-must-adopt-the-newest-technologies-to-be-competitive-siemens-12709303.html*
11	**What to Expect From a Mechanical Engineering Degree** When you study for a mechanical engineering degree, you dive deep into how things are designed, analyzed, and made. You'll start with lots of math and physics because they're the building blocks for more advanced engineering skills. The courses cover a bunch of topics like how heat works, how fluids move, and what materials to use. This all-around knowledge is important because it helps you understand mechanical engineering completely. You also get to work on real projects, which is great for learning how to tackle the kind of problems you'll face in a job. It teaches you to think on your feet and be creative. After you graduate, you'll have a set of skills that many different industries want. This means you could work in fields like the car industry, space exploration, energy sector, or in making machines smarter. So, getting a degree in mechanical engineering really sets you up for an exciting career where you can do lots of different things. **Core Mathematical Foundations** In a mechanical engineering program, it's critical to have a strong grasp of math, including calculus, differential equations, and linear algebra. These areas of math are essential because they help engineers solve a wide range of problems, from understanding how materials behave on a tiny scale to managing the forces at play in large machines. Engineering students must be good at using these mathematical tools and understand how to apply the results to real-life engineering tasks. This deep knowledge is key for creating accurate designs and coming up with new ideas. That's why these math subjects are woven throughout the engineering courses, to make sure graduates know how to use them in different engineering situations. **Essential Physics Principles** In a mechanical engineering program, students dive into important concepts like mechanics, thermodynamics, and electromagnetism. Understanding mechanics is key because it teaches about forces and how they affect objects—this knowledge is critical when building structures or machines that must endure stress and movement. Thermodynamics focuses on how energy, heat, and work interact, which is essential for creating things like engines, heating and cooling systems, and tools that turn one type of energy into another. Electromagnetism deals with electric and magnetic fields and is fundamental for making motors, generators, and the electronic systems that control them.

When engineers really understand these ideas, they can come up with new and better ways to make systems that are efficient, safe, and kind to the environment. For example, they might design a more fuel-efficient engine or a stronger bridge that lasts longer.

Diverse Engineering Disciplines

When you study mechanical engineering, you learn about a lot of different areas, each with its own specific area of focus and unique challenges. For example, in thermodynamics, you look at how energy moves and how heat is transferred. In materials science, you learn about what different materials are made of and how they can be used. Fluid mechanics is all about understanding how liquids and gases behave. On top of these, you also get into more focused fields like robotics, car design, and the building of aircraft and spacecraft. These areas combine designing things, figuring out how to control them, and understanding their movement. To do well in these fields, you need to really grasp the basic ideas in mechanical engineering, but you also need to be able to think on your feet and tackle complicated problems that involve different kinds of knowledge. This wide range of skills means that mechanical engineering graduates are ready to take on lots of different technology problems today.

Practical Design Projects

In a mechanical engineering program, students get to work on a lot of hands-on design projects. These projects are important because they help students learn how to apply their classroom knowledge to solve real-life problems. Students get to create designs from the ground up and then build prototypes, all while using important engineering principles like how forces work, how energy flows, and what materials to use. They need to keep detailed records of their work and constantly check to make sure everything is on track. At the end of a project, they have to present their work to others, who might give them feedback on how to improve. These experiences are really valuable because they give students a collection of work that shows they can think creatively and solve problems, which is exactly what employers are looking for in the fast-changing field of mechanical engineering.

Career Pathways and Opportunities

People who graduate with a degree in mechanical engineering have many job options. They can work in car design, figure out the best ways to use energy, and much more. Mechanical engineers do a lot of different things, like inventing new products, building things, and making sure systems run smoothly. Nowadays, they also work with new technology like robots and smart machines.

Their strong problem-solving skills, learned in school, help them tackle tough problems in many areas, such as space travel, healthcare devices, and clean energy. Mechanical engineers can grow to become lead experts or even run teams. Going back to school for more studies can lead to jobs in universities or deep research. Mechanical engineers can keep up with new inventions and changes in different job areas because they know how to adapt. For example, a mechanical engineer might start by designing parts for cars but later move into managing a team that develops medical equipment. They might take extra courses on how to use 3D printing in manufacturing or lead a project to improve wind turbines. By staying flexible and always learning, they keep their careers exciting and relevant.

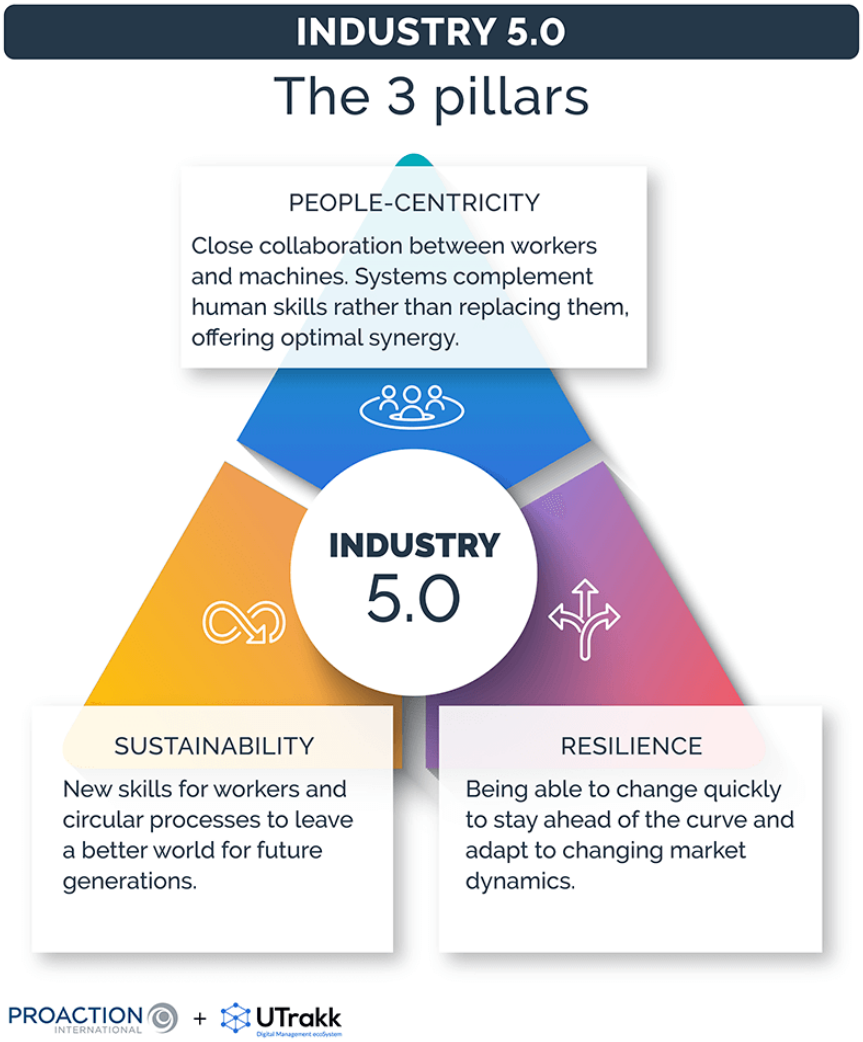
Conclusion

Getting a mechanical engineering degree sets you up with a strong grasp of math and physics, which you need for all sorts of engineering work. In your courses, you'll tackle hands-on projects that mirror the kinds of problems you'll solve in the real world. This way, you're ready for lots of different jobs once you graduate. Besides learning the technical stuff, you'll also get better at figuring things out and thinking creatively. This is key because it means you can really help push technology forward and come up with fresh ideas in industries that are always changing.

	Reference: https://www.discoverengineering.org/what-to-expect-from-a-mechanical-engineering-degree/
12	**India's Manufacturing Sector Sustains Strong Growth Momentum in April, Boosted by Robust Domestic Demand: HSBC Survey** India's manufacturing sector sustained significant growth momentum in April, driven by robust demand, although slightly below the record high of March, according to a recent HSBC survey. The country has emerged as the world's fastest-growing major economy, fueled by substantial government spending on key infrastructure projects like highways, railways, and power plants. This investment has spurred job creation and increased incomes, driving up domestic demand for goods and services. The HSBC final India Manufacturing Purchasing Managers' Index (PMI), compiled by S&P Global, stood at 58.8 in April, slightly lower than March's 16-year high of 59.1, marking a continuous upward trend for 34 months. Pranjul Bhandari, HSBC's chief India economist, noted that April's manufacturing PMI showed the second-fastest improvement in operating conditions in three and a half years, buoyed by strong demand. Businesses expressed optimism, expecting demand to remain robust and planning for higher production volumes in the coming year, leading to increased hiring. However, this surge in demand also pushed up raw material costs and wages, which were passed on to consumers through higher output charges, thereby improving margins. The IMF's World Economic Outlook report, released recently, raised India's growth forecast by 0.3 percentage points to 6.8 percent for 2024-25. The report identifies India as a key contributor to global growth in the medium term, especially in light of economic challenges faced by China and the US. It suggests that India, along with other G20 emerging markets like Brazil, will play a significant role in driving global growth going forward. The report attributes India's robust growth to strong domestic demand, propelled by increased government expenditure on large-scale infrastructure projects and a revival in rural demand. Enhanced allocations for agriculture, rural employment schemes such as MNREGA, and initiatives supporting women's self-help groups have further stimulated rural demand, expanding the market for industrial products. ***Reference**: https://www.linkedin.com/pulse/indias-manufacturing-sector-sustains-strong-growth-momentum-dq1tf/*
13	**India paid Rs 8,512 crore to boost local manufacturing, official says** Critical to Prime Minister Narendra Modi's plans to promote India as a global manufacturing hub, the production-linked incentive scheme has drawn participation from large global and Indian firms including Apple, Foxconn, Samsung Electronics, Hindustan Unilever Ltd and Reliance Industries. New Delhi: India has paid Rs 8,512 crore as incentives to boost local manufacturing, following over Rs 1,08,486 crore in investments from private firms under a scheme introduced in 2020, a top government official said on Wednesday. The Rs 2,00,283 crore production-linked incentive scheme (PLI) is India's key industrial policy and covers 14 sectors ranging from electronic products to drones. Critical to Prime Minister Narendra Modi's plans to promote India as a global manufacturing hub, the scheme has drawn participation from large global and Indian firms including Apple, Foxconn, Samsung Electronics, Hindustan Unilever Ltd and Reliance Industries. It has also helped push mobile phone exports to a record Rs 1,25,177 crore in the fiscal year that ended March 31, according to industry estimates. "The scheme has had a good impact and incentive disbursements have also picked up," Rajesh Kumar Singh, top bureaucrat at India's Department for Promotion of Industry and Internal Trade, told *Reuters*.

	India has exported goods worth Rs 3,00,000 crore- Rs 3,50,000 crore under the PLI scheme, the official said. Production in sectors such as mobile phones, electronics and food processing has "moved faster", while that in white goods and drones has also picked up, he said. Still, textile and specialty steel sectors are seeing some lag and the incentives for those may require tweaks, Singh, whose department oversees the scheme's implementation, said. India regularly reviews the scheme's uptake. There are no "immediate plans" to expand the incentives to other sectors, the official said. ***Reference**: https://www.deccanherald.com/business/economy/india-paid-rs-8512-crore-to-boost-local-manufacturing-official-says-2964972*
14	**India's April business growth at near 14-year high**  India's business activity expanded at its fastest pace in nearly 14 years this month thanks to robust demand, according to a survey released on Tuesday that also showed easing input inflation and positive jobs growth. That suggests India is well placed to remain the fastest growing major economy this year after posting strong expansion over the past few quarters. HSBC's flash India Composite purchasing managers' Index , compiled by S&P Global, rose to 62.2 this month from March's final reading of 61.8. The reading has been consistently above the 50-mark separating expansion from contraction since August 2021. "Strong performance in both the manufacturing and service sectors, led by increased new orders, resulted in the highest composite output index since June 2010," noted Pranjul Bhandari, chief India economist at HSBC. The strong expansion was led by services activity , with the index rising to a three-month high at 61.7 from March's 61.2, thanks to new business - a key gauge for demand - accelerating. A manufacturing PMI held strong at March's 59.1 this month. Both output and new orders for goods continued to grow at a robust pace, albeit slightly slower than last month. Overall international demand was solid and the composite sub-index rose to the highest since it was added to the survey in September 2014. Strong sales improved the business outlook for the coming 12 months from a four-month low in March. Efforts to meet rising demand supported jobs growth, which was the most pronounced in manufacturing where it increased at the fastest pace in one-and-a-half years. However, employment generation among services firms was slower than in March. Meanwhile, input costs cooled for both goods producers and their services counterparts but demand strength enabled passing on expenses to customers. A stronger increase in output costs among manufacturing firms contrasted with a slower rise in the services industry.

	"Manufacturing margins improved in April as firms were able to pass on higher prices to customers due to strong demand conditions," added Bhandari. That means inflation may not fall fast enough for the Reserve Bank of India to start considering rate cuts any time soon as price rises were likely to stay above the central bank's 4% medium term target for longer. ***Reference**: https://economictimes.indiatimes.com/news/economy/indicators/indias-april-business-growth-at-near-14-year-high-pmis-show/articleshow/109519965.cms?from=mdr*
15	**Industry 5.0 Technology: The Synergy Between Humans and Machines** Following on from Industry 4.0, which focuses on machine automation and connectivity, version 5.0 acts as a complement taking it to the next level. The goal of Industry 5.0 is to restore balance by reintegrating the human into the production process. It emphasizes close collaboration between people and technologies. *"Industry 5.0 complements and develops the essential features of Industry 4.0. It focuses on the factors that will decisively determine the place of industry in the future European society; these factors are not only economic or technological but also have a fundamental environmental and social dimension."* - European Commission The three founding pillars of Industry 5.0 • **People-centricity:** Industry 5.0 adopts a people-centric approach, recognizing that human interaction is irreplaceable in many aspects of the manufacturing process. • **Resilience:** Intelligent machines with advanced sensors and algorithms can adjust to new situations without constant reprogramming. This is beneficial in custom production. • **Sustainability:** Industrial processes incorporate planet-friendly practices, prioritizing renewable energies and minimizing waste, over-consumption, and emissions.



The key technologies of Industry 5.0

Artificial intelligence (AI)

AI is the backbone of Industry 5.0, allowing machines to learn, analyze, and make autonomous decisions. Complex AI algorithms enable machines to process and analyze vast volumes of data in real-time, providing valuable insights.

Using machine learning models, AI anticipates trends, identifies potential risks, and forecasts failures. This predictive capability enables proactive management of resources, accurate maintenance planning, and significantly reduced unplanned downtime.

Collaborative robots

Collaborative robotics, or "cobots", work alongside human workers, sharing the workspace and collaborating on specific tasks. This technology provides a winning combination of human skills and mechanical capabilities.

These robots incorporate sophisticated systems that enable them to perceive their environment with remarkable precision. This sensory capacity enables them to perform delicate, repetitive, and/or specialized tasks, freeing human workers from certain operational constraints.

Augmented reality and virtual reality

Augmented reality (AR) and virtual reality (VR) are significant tools for improving the man-machine interface, redefining how we interact with digital and physical environments.

Augmented reality enriches our perception of the natural world by superimposing digital information onto our physical environment. It facilitates instant comprehension of complex data, visualization of instructions in real-time, and access to contextual information without diverting attention from the task.

On the other hand, virtual reality creates fully immersive environments, disconnecting users from physical reality and transporting them into virtual worlds. VR headsets enable users to manipulate virtual objects, perform realistic training simulations, and collaborate remotely with colleagues in shared virtual environments.

Additive manufacturing

Additive manufacturing, or 3D printing, enables the creation of objects layer by layer from various materials (plastic, metal, resin, etc.) following a three-dimensional digital model. This innovative approach offers unrivaled design flexibility, enabling the rapid creation of prototypes and critical components.

Additive manufacturing occupies a key position in Industry 5.0 as it allows for a more agile production for mass customization. 3D printing machines can produce one-off objects as quickly as standard production runs, meeting the growing demand for customized products.

Discover more technologies of Industry 5.0

How Proaction International helps companies succeed in Industry 5.0

- **Leadership development through coaching:** Coaching enables executives and frontline managers to develop interpersonal skills and acquire the right management reflexes and flexibility to navigate changing environments.
- **Key behavioral indicators (KBIs):** Used alongside leadership development, KBIs measure leaders' ability to integrate and apply the knowledge and skills acquired during coaching.
- **Digitizing leadership development in UTrakk:** UTrakk is a Daily Management System (DMS) that supports the development of leadership skills in operations management. It accompanies managers in their roles and daily activities, giving them an overview of priorities, actions, and key performance indicators (including behavioral indicators).

Industry 5.0: Paving the way for perfect synergy between people and technology

By fostering close collaboration between people and machines, encouraging innovation, and integrating cutting-edge technologies, Industry 5.0 opens the way to a future where production becomes more efficient, human, sustainable, and adaptive. It's a transformation that promises to fundamentally reshape how we design, produce, and interact with the world around us.

***Reference**: https://www.linkedin.com/pulse/industry-50-technology-synergy-between-humans-qt6ve/*

16

लोकमत

७३ हजार कर्मचाऱ्यांना नारळ

आयटी कंपन्यांचा निर्णय, मागणी घटल्याने खर्च कपातीसाठी मोठा दबाव

लोकमत न्यूज नेटवर्क

नवी दिल्ली : एक काळ असा होता की युरोप अमेरिकेसोबत भारतातही आयटीची मोठी बूम होती. या क्षेत्रातील दिग्गज कंपन्यांमध्ये जॉब मिळवण्याचे स्वप्न तरुणाई पाहत असे. कंपन्याही दरवर्षी हजारो नोकऱ्या देत असत. परंतु मागच्या वर्षभरात स्थिती बदलली आहे. २०२४ हे आर्थिक वर्ष देशभरातील सर्वात मोठ्या सहा कंपन्यांना वाईट गेल्याचे दिसते. सहा कंपन्यांनी वर्षभरात तब्बल ७३,६०० कर्मचाऱ्यांना कमी केले आहे.

टाटा कन्सल्टन्सी सर्व्हिसेस, इन्फोसिस, विप्रो, टेक महिंद्रा, एलटीआयमाईंटट्री या कंपन्यांनी मोठ्या प्रमाणात कर्मचारी कमी केले आहेत. तिसरी मोठी आयटी कंपनी एचसीएलटेक याला अपवाद आहे. या कंपनीने वर्षभरात ९,५३७ नवे कर्मचारी घेतले आहेत. कोविडकाळात बाजारात कमालीची उदासीनता होती. हा कालखंड ओसरताच कंपन्यांनी जोरदार भरती केली. परंतु या क्षमतेचा पुरेपूर वापर होताना दिसत नाही.

उद्योगाला २५४ अब्ज डॉलर्सचा बसला फटका

- जागतिक पातळीवर सध्या मंदीचे वातावरण आहे. याचा फटका आयटी कंपन्यांना बसला आहे. आर्थिक अनिश्चिततेमुळे मागणी प्रचंड घटल्याने भारताच्या आयटी उद्योगाला २०२४ या आर्थिक वर्षात २५४ अब्ज डॉलर्सचे नुकसान झाले आहे.
- **आयटी उद्योगाची वाढ मंदावल्याने कंपन्यांवर कर्मचारी कपातीची वेळ आली आहे. कोविड काळानंतर या कंपन्यांची जोरदार भरती केली होती. २०२३ च्या आर्थिक वर्षात या सहा कंपन्यांनी ८६,५०० नव्या कर्मचाऱ्यांना सामावून घेतले होते.**

२०२४ या आर्थिक वर्षात भारतातील टॉप तीन आयटी कंपन्यांची कर्मचारी संख्या तब्बल ७० हजारांनी कमी झाली. कोविड काळात प्रमाणाबाहेर केलेली कर्मचारी भरती आणि सध्या तितक्या प्रमाणात कामे नसल्याने कंपन्यांवर कपातीसाठी दबाव मोठ्या प्रमाणात वाढला आहे.

- कृष्णा विज,
बिझनेस हेड आयटी स्टाफिंग, टीमलीज डिजिटा

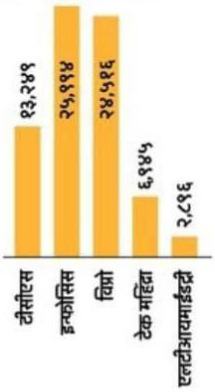
प्रकल्पनिहाय कंपन्यांकडून नियुक्त केलेल्या कर्मचाऱ्यांचे प्रमाण कमी होत आहे. मागणी कमी झाल्याने कंपन्या कर्मचारी नियुक्ती कमी प्रमाणात करू लागल्या. परिणामी कंपन्यांची एकूण कर्मचाऱ्यांची संख्याही कमी करण्यास सुरुवात केली.

- कुमार राकेश,
असोसिएट डायरेक्टर, इक्विटी रिसर्च, बीएनपी परिबास

कपात कशामुळे?

- जगभरातील आर्थिक मंदी
- उद्योगात ऑटोमेशनवर भर
- कर्मचारी पुनर्रचना धोरण
- खर्च कमी करण्याच्या हेतू
- मागणीमध्ये सातत्याने घट

कंपन्यांनी किती जणांना काढले?



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Influencer predicts tough times ahead for techies, says software engineering no longer a guarantee of success and wealth

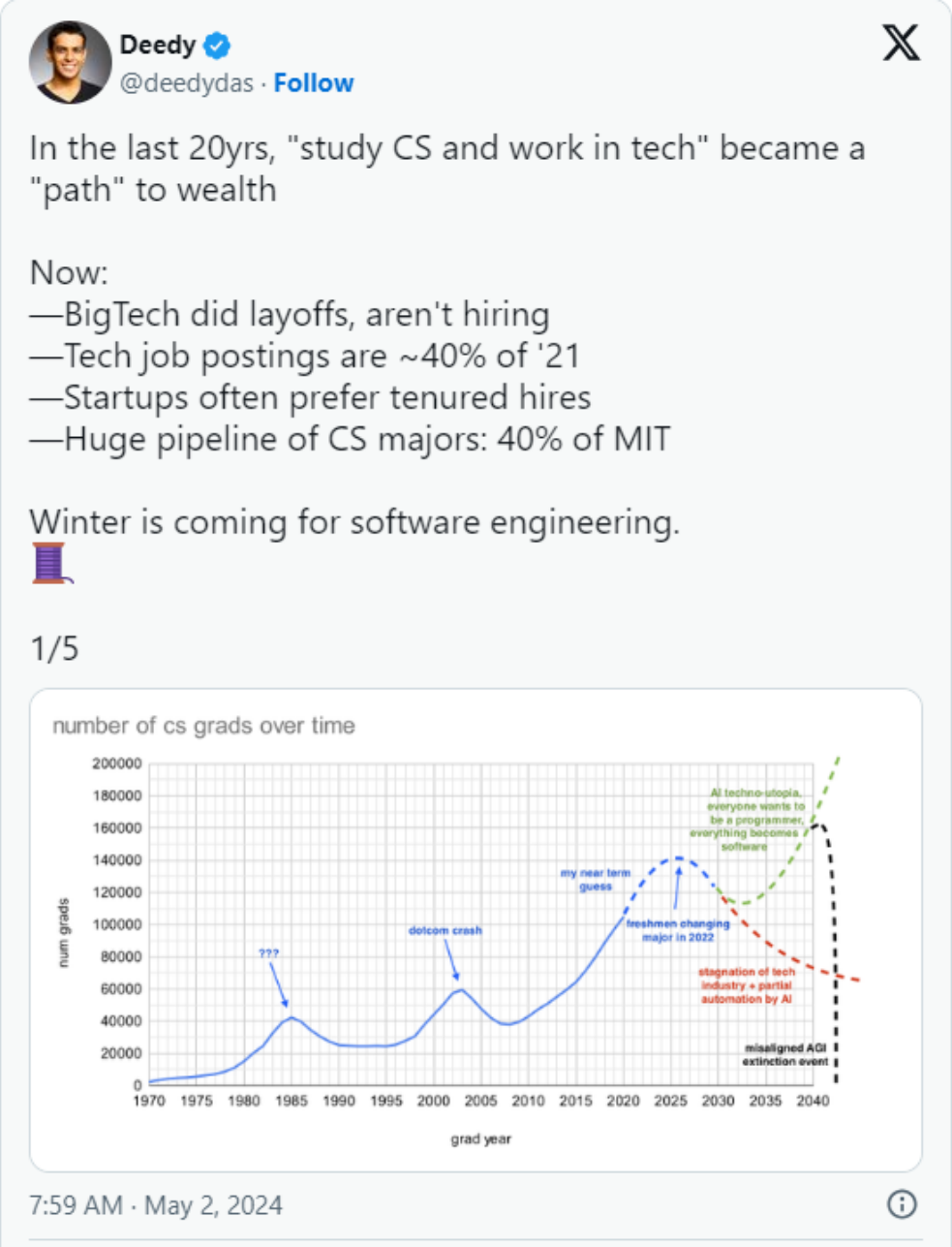
Tech engineering, once a booming sector, is facing challenges as big tech companies, such as Microsoft and Google, have undertaken mass layoffs in recent years. Deedy Das, a prominent tech influencer on X (formerly Twitter), has raised alarms about an impending "winter" for tech engineering. Through a series of Twitter threads, Deedy has highlighted stark differences between the current landscape and the industry's state two decades ago.

Deedy's warnings come amidst a backdrop of shifting trends in the tech job market. Contrary to earlier notions, where pursuing Computer Science (CS) seemed a sure path to employment in the burgeoning field of Edtech, Deedy suggests a grim reality. Despite significant layoffs, companies exhibit reluctance towards new hiring initiatives. Startups, in particular, are leaning towards experienced hires, shunning fresh graduates.

Reflecting on the evolution of technology's role in society, Deedy notes a diminishing scope for innovation. He points out how, compared to the year 2000, where technology played a relatively smaller role in people's lives, the present-day reliance on tech has surged. However, this surge hasn't translated into expanded job opportunities, as companies prioritize efficiency over scale.

Moreover, the rise of artificial intelligence (AI) poses a looming threat to traditional job roles. Deedy underscores how AI algorithms are progressively replacing tasks previously performed by humans. With AI's growing prominence, the demand for human-centric software engineering roles may dwindle further.

While acknowledging the cyclical nature of technological trends, Deedy remains skeptical about a swift resurgence in the tech job market. He observes a reluctance among startups to invest in training

	new graduates, citing the high costs involved. Consequently, a significant percentage of Computer Science graduates find themselves unemployed, highlighting a mismatch between academic training and industry demands. In conclusion, Deedy's warnings serve as a cautionary tale for the tech industry. While he stops short of painting a doomsday scenario, he foresees a prolonged period of stagnation before the sector experiences another boom cycle. As the industry grapples with evolving technologies and shifting market dynamics, the future of tech engineering remains uncertain.  ***Reference***: *https://economictimes.indiatimes.com/jobs/fresher/influencer-predicts-tough-times-ahead-for-techies-says-software-engineering-no-longer-a-guarantee-of-success-and-wealth/articleshow/109778330.cms?from=mdr*
18	https://www.linkedin.com/posts/sarveshagrawal_core-engineering-main-scope-hai-kya-is-activity-7183064790913757184-qXuU?utm_source=share&utm_medium=member_ios
19	https://www.youtube.com/watch?v=ydKkwapSHC4
20	https://www.facebook.com/watch/?mibextid=WC7FNe&v=889763669596616&rdid=yPLDlYTO1meobVeB