



# Welcome to Session By Technical Education and Skilling on Empowering Bengal: Nurturing Future Ready Skills For A High Precision Work Force

**BENGAL GLOBAL  
BUSINESS SUMMIT**

5-6 February '25



**Vinay Kumar M.K.**

**Vinay Kumar is a seasoned leader in Business Management, possessing over thirty plus years of experience in the realm of Industrial Automation. He earned his Bachelor of Engineering degree in Instrumentation Technology from Gulbarga University in Karnataka and holds a Diploma in Management from Indira Gandhi National Open University.**

Currently, he leads Business Development initiatives at FANUC INDIA, a renowned Japanese company recognized as a pioneer in Factory Automation and Industrial Robotics. His professional journey includes tenures at esteemed organizations such as Siemens, Rittal India and various other firms in the industrial sector.

As General Manager, he is responsible for projects that position FANUC as a comprehensive automation solution provider. Additionally, he oversees the Indian Institute Relations role, where he actively collaborates with both government and private institutions to address training needs and enhance skill development.



[www.wbidc.com](http://www.wbidc.com)

Chamber Partners



Knowledge Partners



[bengalglobalsummit.com](http://bengalglobalsummit.com)



**BENGAL** means BUSINESS



**BGBS-2025**



# Need for Precision Engineering in Automation

By: Vinay Kumar M.K  
Business Development Head

**FANUC INDIA**



# Precision Engineering in Automation

It is a fast paced manufacturing world. The need for precise and quick production with best quality is now taking over the manufacturing landscape in India as well. That can only be achieved through understanding the need for automation for precise production capacities.

**Precision engineering** focuses on creating components with extreme accuracy and tight tolerances, essential for modern manufacturing.

**Automation** utilizes technology and machinery to perform tasks with minimal human intervention, enhancing efficiency and consistency.

***The integration of precision engineering and automation leads to improved product quality, reduced errors, and increased production speeds.***

# Advantages of Precision Engineering



## High Efficiency and Throughput:

Automation leads to faster production cycles. For example, in automotive assembly lines, robots can perform tasks up to **30% faster** than humans.



## Enhanced Product Quality:

Precision engineering minimizes product defects. For example, automotive parts produced using automated systems can reduce defects by up to **90%**.



## Cost Reduction Over Time:

While initial investment is high, long-term savings due to automation reduce labor costs by **30-40%** in certain manufacturing sectors.



## Consistency in Production:

Precision engineering allows for uniform quality across multiple production batches, crucial in industries like pharmaceuticals, electronics, and aerospace.



## Scalability and Flexibility:

Precision manufacturing allows for easy scaling, adapting production processes to fluctuating market demands.



## Energy Efficiency:

Automation reduces the energy consumption per unit of output by **15-20%** by optimizing machine usage and eliminating inefficiencies.

# Role of Precision Engineering in Key Indian Manufacturing Sectors

## Automotive Sector:

- India is the world's 4th largest automobile producer. Automation, including robotic welding and assembly lines, allows for precise manufacturing of parts, improving both speed and quality.
- **Key Players:** Tata Motors, Maruti Suzuki, and Mahindra are heavily investing in precision-engineered automated systems.



# Role of Precision Engineering in Key Indian Manufacturing Sectors

## Electronics:

- India has become a hub for electronics assembly with the **Make in India** initiative. High precision is essential for PCB assembly, mobile phone manufacturing, and semiconductor production.
- **Key Players:** Samsung, Foxconn, and Wistron have expanded production lines in India, bringing in cutting-edge automated equipment.



# Role of Precision Engineering in Key Indian Manufacturing Sectors

## Pharmaceutical :

- India is the largest supplier of generic drugs globally. Automation ensures precise batch production, meeting stringent international standards.
- Automation in the pharmaceutical sector helps in improving yields and consistency.
- **Key Players:** Dr. Reddy's, Cipla, and Sun Pharmaceuticals are among the leaders investing in automated manufacturing solutions.



# Role of Precision Engineering in Key Indian Manufacturing Sectors

## Food and Beverages :

- India's food processing industry is another growing sector with a rising demand for automation to ensure hygiene, quality, and productivity.



# Innovations in Precision Engineering

## 1. Artificial Intelligence and Machine Learning:

1. AI is increasingly being integrated into precision automation for real-time process optimization, predictive maintenance, and quality control.
2. **India's Growth:** AI-driven automation in manufacturing is projected to create **USD 1.2 billion** in value by 2027 in India.

## 2. Collaborative Robots (Cobots):

1. Cobots are changing the automation landscape in India by working alongside human operators. This is reducing human error while also improving productivity.

## 3. 3D Printing:

1. The use of 3D printing in precision engineering enables on-demand parts production, reducing lead times and costs for highly customized components.
2. In India, 3D printing for manufacturing applications is expected to grow by **30% annually**.



# Challenges in Adopting Precision Engineering

## 1. High Initial Capital Investment:

A high cost of adopting precision automation systems, particularly for small and medium enterprises (SMEs) in India. This can run into millions of dollars for state-of-the-art robotic systems.

## 2. Skills Gap:

India faces a significant shortage of skilled labor trained in robotics, AI, and precision engineering. As of 2023, only **6%** of India's workforce is equipped with the technical skills required for automation roles.

## 3. Operational Complexity:

Managing and maintaining high-precision automated systems requires specialized knowledge. Breakdowns can result in expensive downtime and repairs.

## 4. Cybersecurity Risks:

Increased dependency on automation introduces vulnerabilities to cyberattacks, which can disrupt critical manufacturing operations. The estimated **cost of cyberattacks** in Indian manufacturing is expected to reach **USD 1 billion** by 2025.

## 5. Unemployment Risks:

Automation may reduce the demand for manual labor, leading to concerns about job losses. This issue is particularly relevant in labor-intensive industries like textiles, where automation could result in significant workforce displacement.

# Challenges in Adopting Precision Engineering

## 6.Lack of Policy Support:

1. While initiatives like “Make in India” have promoted manufacturing, there is still a lack of comprehensive government policies to support widespread automation adoption, especially in smaller industries.

## 7.Training and Skill Development:

2. While there are growing institutions offering courses in robotics and automation, there is still a huge skills gap. The **National Skill Development Corporation (NSDC)** is working to bridge this gap, but progress remains slow.

# The way ahead

- **Align education with industry needs:** Understand core industry skill requirements and guide young talent accordingly.
- **Promote emerging fields:** Educate students about niche manufacturing segments, such as nanotechnology.
- **Establish Centre's of Excellence:** Develop these centre's in academic institutions to familiarize students with relevant technologies.
- **Integrate practical experience:** Encourage hands-on, project-based learning throughout the curriculum.
- **Implement supportive policies:** Introduce favourable government policies to facilitate these programs.

**As a world leader in precision manufacturing, we rely on the power of automation. Our state-of-the-art facilities are fully automated, ensuring the highest levels of quality and precision.**

**See it yourself!**



# FANUC

## AUTOMATED FACTORIES

**CNC Factory**

# **FANUC**

**automated factories in Japan  
are a great example of how automation can  
optimise precision production without  
compromising on quality.**

**Thank you.**