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## National Mission on Interdisciplinary Cyber-Physical Systems

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The Union Cabinet has approved the launching of **National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)** to be implemented by **Department of Science & Technology** for a period of **five years**.

NM-ICPS covers entire India which includes Central Ministries, State Governments, Industry and Academia.

### Cyber-Physical Systems

- Cyber-physical systems **integrate** sensing, computation, control and networking **into physical objects and infrastructure**, connecting them to the Internet and to each other.
- Few Potential applications: **Driverless cars** that communicate securely with each other **on smart roads**, Sensors in the home to **detect changing health conditions**, improving **agricultural practices** and enabling scientists to address issues arising out of climate change, etc.
- Advances in cyber-physical systems will enable capability, adaptability, scalability, resiliency, safety, security and usability that will far exceed the simple embedded systems of today.

### Objective

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- The NM-ICPS is a comprehensive Mission which would address technology development, application development, human resource development & skill enhancement, entrepreneurship and start-up development in Cyber Physical System (CPS) and associated technologies.
- The Mission aims at establishment of **15 Technology Innovation Hubs (TIH)**, **six Application Innovation Hubs (AIH)** and **four Technology Translation Research Parks (TTRP)**.

- These Hubs & TTRPs will connect to **Academics, Industry, Central Ministries and State Government** in developing solutions at reputed academic, R&D and other organizations across the country in a hub and spoke model.
- The Hubs & TTRPs have **four focused areas** along which the Mission implementation would proceed, namely:
  - Technology Development,
  - HRD & Skill Development,
  - Innovation, Entrepreneurship & Start-ups Ecosystem Development, and
  - International Collaborations.

## Background

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- CPS and its associated technologies, like Artificial Intelligence (AI), Internet of Things (IoT), Machine Learning (ML), Deep Learning (DP), Big Data Analytics, etc. have pervaded and is playing a transformative role in almost every field of human endeavour all most in all sectors.
- Therefore, It has become imperative for government and industries to be **prepared to adopt these emerging and disruptive technologies in order to remain competitive**, drive societal progress, generate employment, foster economic growth and to improve the overall quality of life and sustainability of the environment.

## Impact

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- CPS technologies provide a **cutting edge to a Nation's scientific, engineering, and technological innovative capabilities**; support other missions of the government, provide industrial and economic competitiveness and have truly **become a Strategic Resource**.
- The proposed Mission would act as an **engine of growth that would benefit national initiatives** in health, education, energy, environment, agriculture, strategic cum security, and industrial sectors, Industry 4.0, SMART Cities, Sustainable Development Goals (SDGs) etc.
- CPS is an integrated system of upcoming technology, which in turn is being taken up on priority basis by countries in the race for development. CPS will indeed bring a paradigm shift in entire skill sets requirement.
- The **job opportunities will be enhanced** through the Mission by imparting advanced skills and generating skilled manpower as per the requirement of the industry/ society. Accordingly, it is estimated that, about 40,000 jobs will be created in the short term and about 2,00,000 in long term.