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Medical Cobotics Centre (MCC) facility encourages developing indigenous cobots to enhance healthcare services in India

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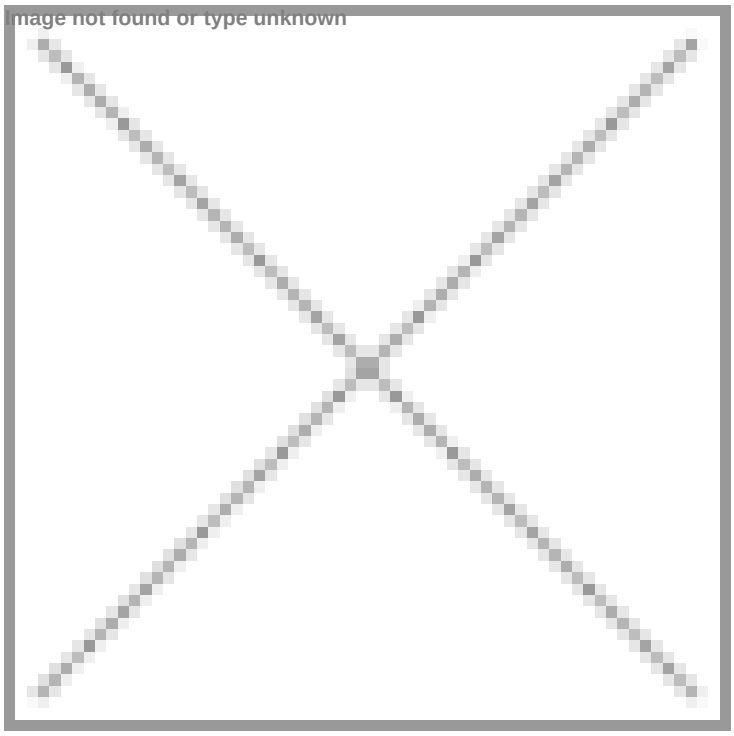
In September 2023, and IHFC (Technology Innovation Hub of IIT Delhi) and iHub Anubhuti (Technology Innovation Hub of IIIT-Delhi) jointly inaugurated a facility called Medical Cobotics Centre (MCC) at Indraprastha Institute of Information Technology (IIIT) Delhi campus. Both TIH's (Technology Innovation Hubs) are formed by DST (Dept of Science and Technology) under NMICPS mission. The MCC is aimed at being India's first state-of-the-art technology-enabled medical simulation and training facility for doctors, paramedics, technicians, engineers, biomedical researchers, and entrepreneurs. The Centre is also equipped to offer hands-on simulation training to the medical fraternity across the country. Dr. Rashmi Tripathi and Dr. Seema from IHFC, co-responded over an email interview by BioSpectrum India on the Center's role in developing cobotics.



Please give a brief on MCC, its vision and mission.

The Medical Cobotics Centre (MCC) located at Indraprastha Institute of Information Technology (IIIT), Okhla, New Delhi, has been set up as a joint initiative of IHFC (Technology Innovation Hub of IIT Delhi) and iHub Anubhuti (Technology Innovation Hub of IIIT Delhi), under the NM-ICPS mission of Department of Science and Technology (DST), Government of India.

This facility is envisaged as one of its kind Centre of Excellence (COE) in the field of Healthcare, Medical Cobotics and AI in India. The centre has been set up to create an ecosystem for Skill Development, R & D and Startups in the field of Medtech devices and equipment. This Facility aims at bridging the gap between the medical & engineering fields by providing a

common platform for collaboration on training, research, new product development and commercialisation.

The stated objectives of the Medical Cobotics Centre (MCC) include:

- To provide long-term sustainable indigenous solutions to the country in medical systems and technologies.
- To remain connected with medical industry to cater to their demands at every stage.
- To collaborate with widespread network of stakeholders like facilities created by other hospitals and Govt. Institutions like ICMR etc.
- Partnering with entities like Industry including Medtech, Pharma, Digital health, for creating a better ecosystem around.
- Ecosystem partners – Healthcare service providers, hospitals, diagnostics centres, Researchers, Academicians, Product developers, Incubators, Accelerators, Financial, Regulatory and design consultants.

MCC is a 10,000 sqft facility in the heart of Delhi with the following facilities:

- Space for Medical trainings on simulators, Medical workshops.

- Innovation and Research facility to help Academic institutes & researchers in technology & medicine.

- Incubation centre for startups for better and affordable Product design.

- Medical Devices Test centre and AR/ VR facility.

- Display Centre of Prototypes, conceptualized by Students and Researchers.

- High Performance Computing Facility & data centre for digital healthcare researchers.

What are the unique challenges faced by the Indian healthcare system that the Medical Cobotics Centre aims to address through its innovations? Could you provide specific examples of cobot-driven solutions tailored to India's needs?

Most of the innovation, research and new business ideas in healthcare happen in silos. Various stakeholders in the ecosystem – healthcare providers, technologists and researchers, industry, medical and technology academia, start-ups – do not interact with each other. This poses significant challenges to the innovation ecosystem like:

- Lack of “Lab to Market” commercially viable product-oriented research.

- Product creation happens in silos.

- Lack of problem-oriented approach.

- Poor product market fit for innovative products.

- Difficulty in getting regulatory and compliance related approvals.

- Difficulty in scaling up health tech products created by startups.

These are some of the challenges that we are trying to solve for at MCC.

An example of a homegrown innovation includes a telerobotic Ultrasound System, developed by Prof. S.K. Saha and Prof. Chetan Arora from IIT Delhi and Dr Chandrashekhara from AIIMS, New Delhi. This system has been designed for use in future pandemics where contact between healthcare providers and infected patients is to be avoided. Moreover, IHFC is funding various R & D projects in the area of rehabilitation robotics and prosthetic devices at premium institutes across the country to deliver low-cost healthcare solutions for the Indian disabled population.

What initiatives has the Centre undertaken to build a skilled workforce capable of developing, deploying, and maintaining medical cobot technologies in India? Are there any specific programmes or collaborations addressing this area?

At MCC, IHFC is conducting simulation-based trainings and workshops to address this concern by partnering with Vidyanta and AIIMS. Since it has recently started, our endeavour is to keep this MCC dedicated 365 days a year for such trainings.

Other threads include medical start-up incubation and collaborations with relevant government and non-governmental medical entities for Funding, Mentorships and Accessibility to research labs for testing new innovations and prototypes and introducing them to the industry and customers.

In the next 2-3 years, what do you see as the most promising areas for medical cobot development in India? Where do you see the Centre making the greatest contributions?

IHFC has also spearheaded multiple R & D projects in rehabilitation and healthcare robotics. Both IHFC and its collaborator i-Hub Anubhuti are supporting lots of start-ups in the field of applying AI in healthcare. The future could see more diversification of MCC activities into multiple applications in Medical domain.

What are the primary regulatory, infrastructural, or adoption barriers the Centre foresees in the widespread use of medical cobots in India? How is the Centre working to proactively address these challenges?

These are the challenges:

Regulatory Challenges: Introducing new medical technologies involves navigating regulatory approval processes such as ISO 14971. Streamlining these processes for emerging technologies like medical cobots is essential to ensure timely deployment. IHFC has collaborated with mPragati in this regards to facilitate the regulatory approvals.

Infrastructure: Widespread adoption of medical cobots requires robust technological infrastructure like research labs including high-speed internet connectivity, to help researchers to innovate, startups to support funding, Industry exposure, remote monitoring, data exchange, and teleoperation. Proper training facilities on new products/ technologies will ensure they can effectively use and integrate medical cobots into their practice.

Adoption Issues:

- The use of medical cobots involves the collection and exchange of sensitive patient data. Establishing robust data security and privacy measures is critical to gain trust and ensure compliance with regulations.
- Efforts to make these technologies more affordable and accessible could drive adoption.
- Cultural attitudes towards technology in healthcare may differ, and public perception can influence the acceptance of medical cobots. Educating the public about the benefits and safety of these technologies is essential for widespread adoption.
- Developing a legal framework that addresses liability issues associated with the use of medical cobots is crucial. This includes determining responsibility in case of errors or malfunctions and defining insurance policies to cover potential risks. Addressing ethical considerations related to patient autonomy, informed consent, and the responsible use of artificial intelligence in healthcare is essential for gaining public and professional trust.
- Lack of awareness and education among healthcare providers, administrators, and the general public about the capabilities and benefits of medical cobots can hinder widespread adoption.

The MCC is trying to overcome these barriers making a conducive and inclusive ecosystem by collaborating with regulatory bodies, industry stakeholders, healthcare professionals, and policymakers to create an environment for successful integration of medical cobots into the healthcare system.

Presence of affordable simulators in India is a challenge. Hence, we want startups to make indigenous simulators for nurses, paramedical staff, police, and other departments as well to start with to provide proper training to healthcare professionals.

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