



techzine

C-DAC R&D DIGEST

JULY 2025 – SEPTEMBER 2025
VOLUME 1, ISSUE 10



INSPIRING INSIGHTS | IDEAS TO ACTION | PROGRESS PULSE: A PERFORMANCE DASHBOARD | TECH ROLLOUTS

www.cdac.in



Table of Content

Message from Director General.....	05
Message from Editorial Board.....	06
Inspiring Insights on new frontiers.....	07
Ideas to Action.....	20
Progress Pulse: A Performance Dashboard.....	29
Tech Roll-outs	59
International Outreach.....	69
Events.....	75
Back-end Squad.....	81





Message from Director General

I am pleased to announce the release of the Tenth issue of Techzine R&D Digest from C-DAC. Heartfelt congratulations to the Corporate R&D team on this significant achievement. I extend my warmest greetings to all C-DACians who have contributed in Techzine for sharing their expertise, passion for research, innovation, and the pursuit of knowledge.

This issue is focusing on various aspects of "Quantum Technologies". As you are aware that C-DAC has been selected as a Member Institute for India's National Quantum Mission (NQM) in the thematic hub of Quantum Computing and Quantum Communication. Also, C-DAC is playing a pivotal role in driving India's progress in quantum technologies through focused research, infrastructure development, international partnerships, and ecosystem-building initiatives. I am proud to mention here that C-DAC has completed development of various solutions in this domain including Quantum Simulator, Metro Access Quantum Area Network (MAQAN) etc. and in process of developing Quantum Reference Facility.

Readers are encouraged to stay curious, informed, and engaged with breakthroughs of C-DAC in the area of Quantum Technologies, as they hold the key to transformative impacts across science, industry, and society.

Together, let us continue to explore, innovate, and shape a quantum-powered future with security and trust at its core.

Magesh Ethirajan





Message from Editorial Board

The Editorial Board of Techzine proudly reflects on the impactful journey of the past nine issues, which have effectively showcased C-DAC's pioneering technical activities, fostering awareness, and facilitating recognition, deployment, and adoption across key stakeholders including MeitY, academia, research institutions, and industry.

With great enthusiasm, we present the Tenth Issue, dedicated to "Quantum Technologies," featuring insightful articles on 'PARAM Pratham,' 'Quantum-AI Fusion,' and 'Quantum Foundations.'

Editorial Board of Techzine extends heartfelt thanks to our readers for their unwavering engagement and encourage everyone to keep exploring and contributing to these transformative technologies.

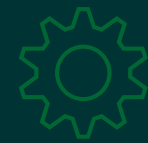
This collective endeavor reaffirms our dedication to advancing C-DAC's mission and fostering a robust ecosystem of innovation, collaboration, and excellence.

Editorial Board

- Mr. Pramod P.J., Head – Corporate R&D
- Mr. Manoj Gopinath, Head, Branding & Communications, C-DAC Pune
- Mr. Shripad Kalambkar, Scientist E, Corporate R&D
- Mr. Anant Kelkar, Manager, Corporate R&D
- Mr. Sanjay Chakane, Admin Officer, Corporate R&D



INSPIRING INSIGHTS ON NEW FRONTIERS



PARAM PRATHAM: SHAPING INDIA'S QUANTUM-READY FUTURE

C-DAC, the pioneer of High-Performance Computing (HPC) in India, has a distinguished legacy of delivering the PARAM series of supercomputers to academia, R&D organizations, and strategic sectors. Over three decades, PARAM systems have enabled breakthroughs in weather modeling, molecular dynamics, scientific simulations, and national security applications, establishing India as a global player in advanced computing.

As the world enters the era of Quantum Technologies, computing paradigms are undergoing a fundamental shift. Classical supercomputers, despite their enormous capabilities, face limits in solving certain classes of problems related to optimization, secure communication, quantum materials, and complex simulations. Quantum computers, leveraging the principles of superposition and entanglement, promise exponential acceleration in these domains. It is in this context that C-DAC envisions its next transformative mission: PARAM Pratham, a superconducting-based quantum computer, tailored for academic and research use.

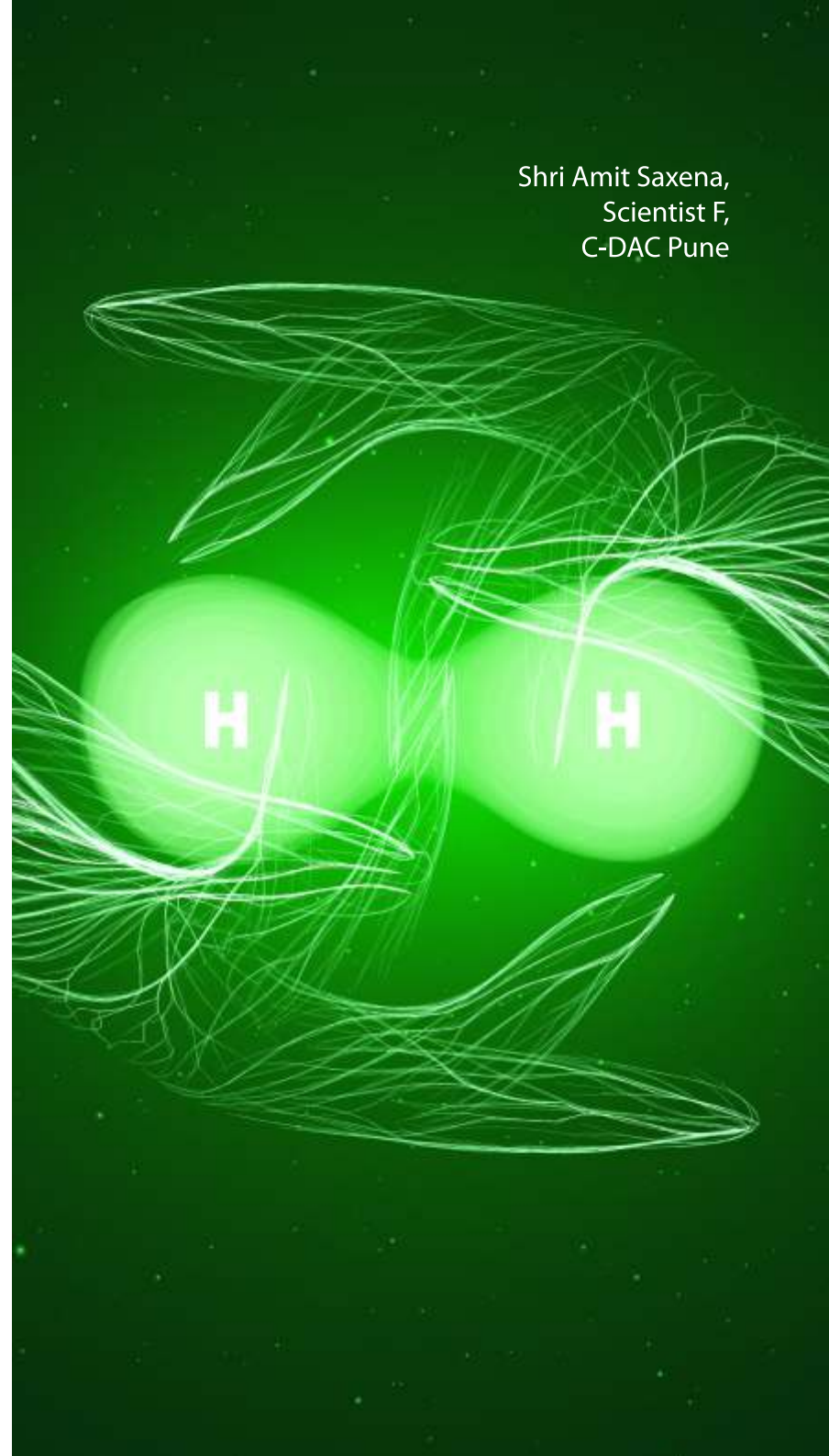
Extending the PARAM Model to Quantum Computing

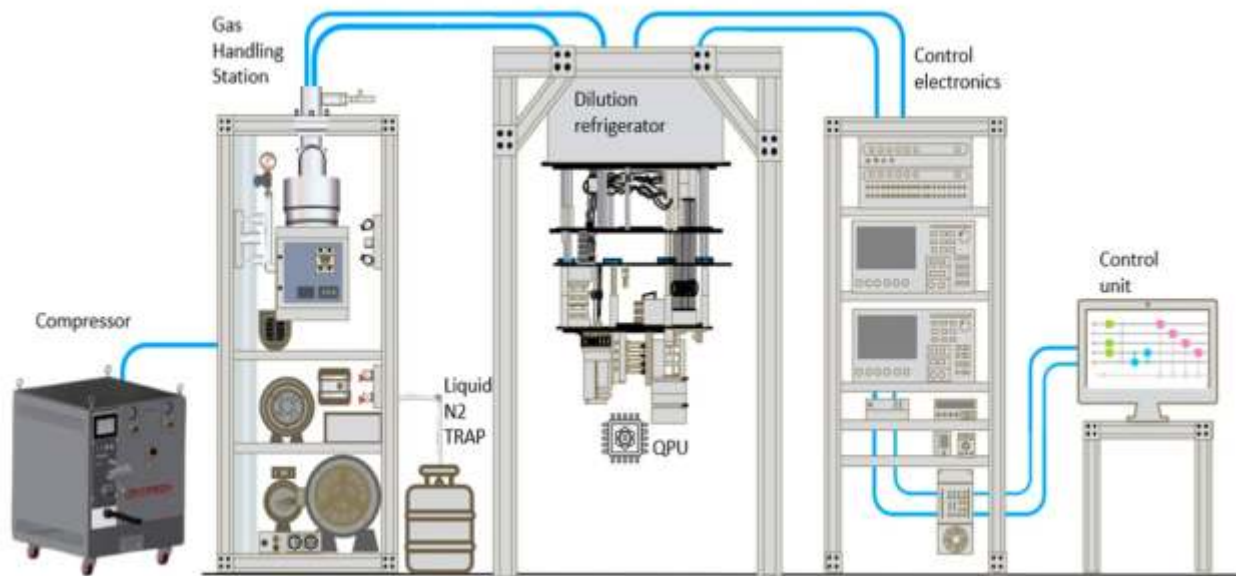
PARAM Pratham extends the successful model of PARAM Shavak, which democratized access to HPC by bringing desk-side supercomputers to universities and laboratories. Similarly, PARAM Pratham is designed to meet the rapidly growing need for hands-on quantum infrastructure across India's 5,800+ engineering colleges, technical universities, and R&D labs.

The system will:

- Provide modular access to real qubits, enabling experimentation beyond simulation.
- Facilitate cross-disciplinary education and research, linking physics, computer science, and engineering domains.
- Support certification and training programs in quantum technologies, helping build a skilled workforce.
- Enable practical quantum-ready environments in academic labs, preparing students for careers in emerging technologies.

Shri Amit Saxena,
Scientist F,
C-DAC Pune





Technical Roadmap of PARAM Pratham

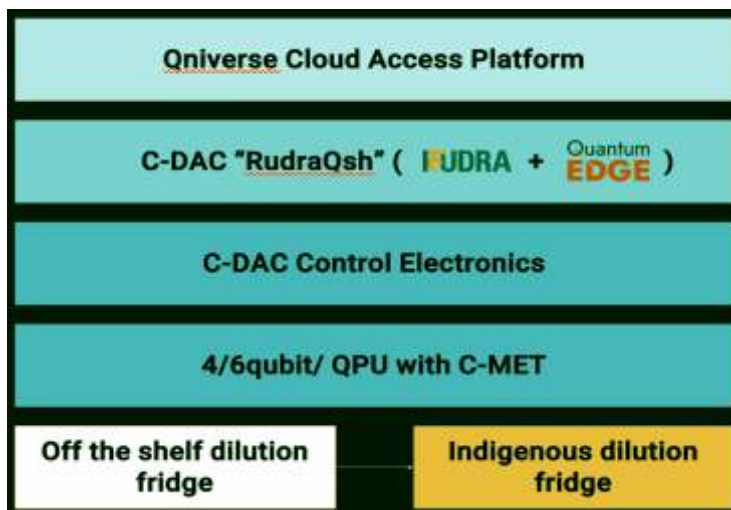
The project will begin with a Proof-of-Concept (PoC) phase at C-DAC Pune. The PoC will initially use off-the-shelf quantum components to accelerate integration and validation. In later phases, the system will be upgraded with fully indigenous subsystems, ensuring strategic autonomy and adherence to Make in India guidelines.

Key indigenous components to be integrated include:

- Quantum Control Electronics developed by C-DAC for precision qubit operations.
- RudraQsh, an automated qubit calibration appliance based on C-DAC's Rudra Server to enhance system reliability.
- Qniverse, a software stack designed for hybrid quantum-classical computing, enabling seamless integration with HPC platforms.
- An indigenous Quantum Processing Unit (QPU), co-developed with C-MET Pune, advancing the nation's capability to design and fabricate superconducting qubits.

The PARAM Pratham system will also leverage other quantum products developed by various C-DAC centres, creating a comprehensive ecosystem of hardware and software innovation.





Productization and Access

Once validated, PARAM Pratham will be refined into a deployable product. Institutions across India will be able to procure the system via the Government e-Marketplace (GeM) portal. The business model will combine equipment sales, software licensing, training services, and annual maintenance contracts, ensuring long-term sustainability.

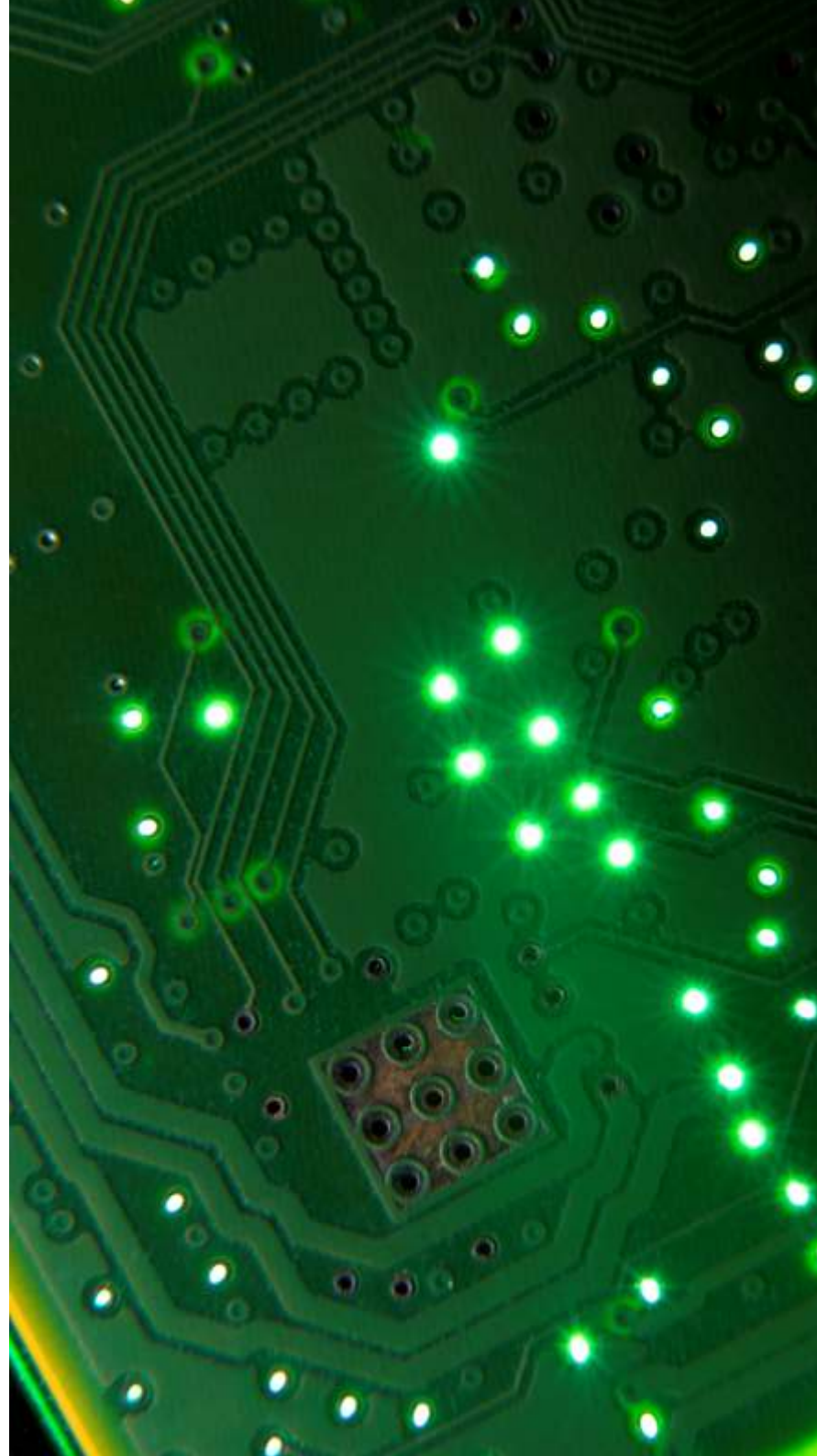
By following this model, PARAM Pratham will not only become a platform for research and education but also foster a quantum industry ecosystem in India, driving startups, collaborations, and indigenous innovation.

Transformative Impact

The vision for PARAM Pratham is not limited to hardware deployment. Its real impact lies in democratizing access to quantum computing. By placing quantum systems in academic environments, students and researchers will gain unprecedented opportunities to experiment with real qubits, develop algorithms, and create novel applications.

Applications of PARAM Pratham are expected across domains:

- Civil & Mechanical Engineering: advanced materials and structural simulations
- Chemical Engineering: molecular modeling and reaction optimization
- Electronics & Instrumentation: quantum device design and control
- Computer Science: quantum algorithms, hybrid HPC-Quantum integration
- Security & Cryptography: exploring quantum-safe communication systems



HPC Quantum Integration

As part of its quantum computing roadmap, C-DAC is advancing the integration of quantum systems with PARAM Siddhi, to create an HPC-Quantum Integrated environment. This hybrid platform combines the massive parallel processing power of classical HPC with the unique capabilities of quantum accelerators, enabling researchers to explore complex problem classes that are otherwise intractable. PARAM Pratham, envisioned as India's first superconducting-based quantum computer, carries forward this legacy into the emerging frontier of quantum technologies. While PARAM Siddhi delivers classical computational power at scale, PARAM Pratham is designed to provide hands-on access to real qubits for academia and research. Together, they form the foundation of an HPC-Quantum integrated ecosystem, where Siddhi's parallel processing capabilities complement Pratham's quantum acceleration potential. This synergy will enable hybrid workflows for complex problem-solving in areas such as materials science, climate modeling, drug discovery, secure communication, and optimization—empowering India to lead in the global race toward next-generation computing.



Towards a Quantum-Ready India

PARAM Pratham represents more than a technological milestone; it is a strategic enabler for India's quantum journey. It complements national missions in quantum technologies, strengthens academic capacity-building, and aligns with the global push toward hybrid quantum-classical computing.

By equipping academic and research institutions with indigenous quantum infrastructure, PARAM Pratham will nurture talent, stimulate innovation, and prepare India for the coming quantum revolution. Just as PARAM supercomputers once empowered the nation's scientific community, PARAM Pratham will inspire the next generation to explore the uncharted frontier of quantum technologies.



QUANTUM-AI FUSION: HOVER TO EXPLORE THE NEXT FRONTIER

Introduction

Artificial intelligence (AI) has transformed many areas by introducing smarter systems that can observe, reason, and make decisions. However, classical AI/ML systems face critical challenges in handling complex datasets, efficiency, and scalability. Quantum computing has ability to transform AI by offering entirely new ways of representing and processing information. This article explores issues in classical AI, quantum advantage, hybrid quantum-classical smart systems, challenges in quantum-enhanced AI, and tools powering quantum-assisted AI.

Why Classical AI Is Hitting a Wall?

AI revolution is fueled by specialized processors like GPUs/TPUs and massive amount of data. It has led to tremendous breakthroughs in everything from voice assistants to medical image analysis and many more. Yet, as ML models scale to large numbers of parameters, datasets grow in complexity (e.g. multi-modal data combining images, text, and signals), and the cost of keeping AI running increases exponentially. Training these massive models demands vast amounts of energy and time, straining both hardware and sustainability. Further, classical algorithms still struggle with many intractable pattern recognition and combinatorial optimization problems.

The Quantum Advantage

Quantum computing is unlike anything in the classical world. Instead of relying on bits that are either 0 or 1, it uses quantum bit (qubits) that can exist in multiple states at once due to principles of quantum superposition and entanglement. This gives quantum computers the ability to explore many possibilities in parallel, making them especially powerful for AI tasks. When applied to AI and machine learning, this capability could be game-changing, quantum algorithms promise to:

- Represent and analyze massive, high-dimensional datasets far more efficiently
- Deliver dramatic speed-ups in optimization, linear algebra, and kernel estimation
- Discover subtle relationships in data
- Unlock entirely new ways of mapping and understanding data

Dr. Gurmohan Singh,
Scientist-E,
C-DAC Mohali



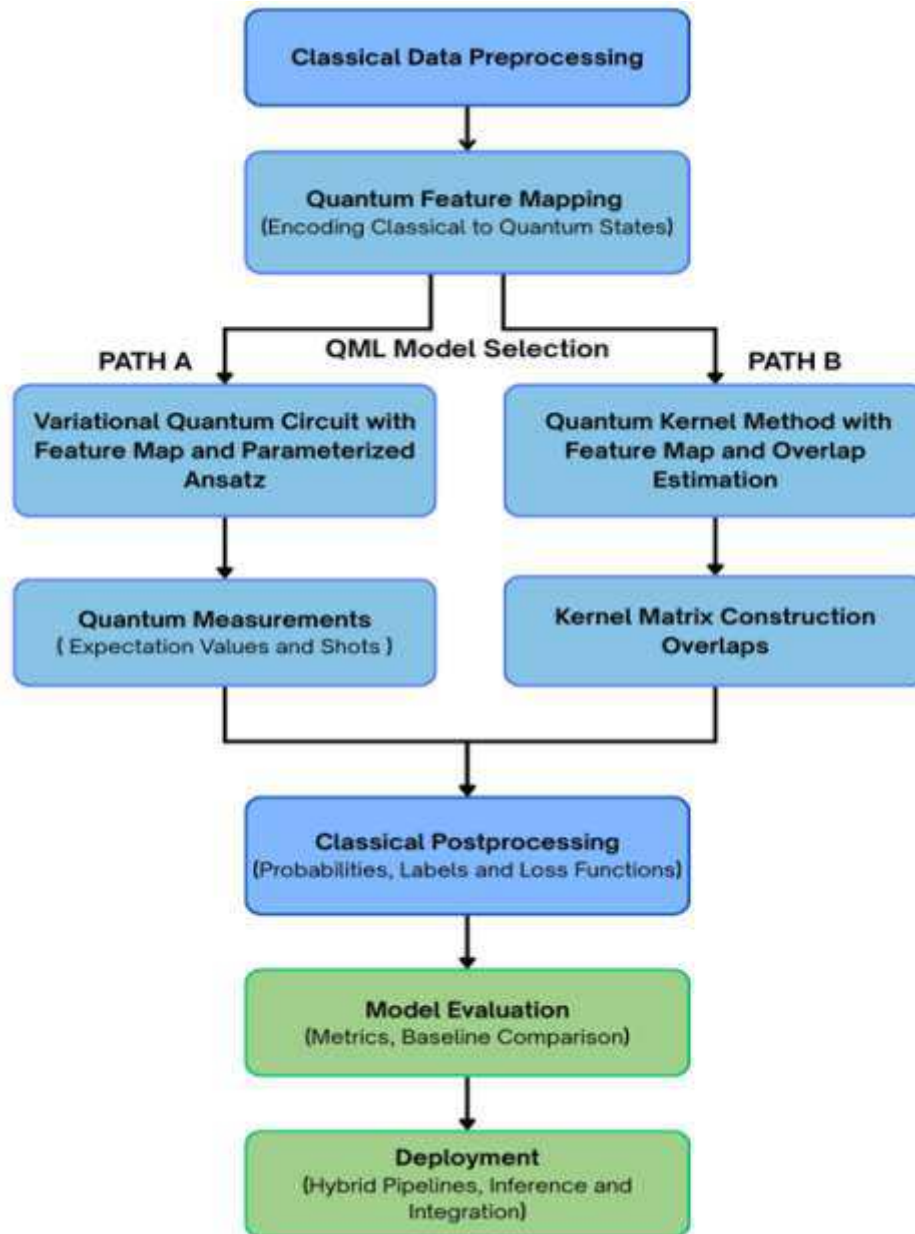
The impact could be profound. Training today's deep neural networks on petabytes of data can take weeks or months, draining energy on a massive scale. Quantum-enhanced approaches could shorten this timeline dramatically, making AI faster, greener, and more accessible.

Smarter Learning Through Hybrid Systems

The path to a quantum boost is not about replacing classical AI with quantum machines but about building hybrid systems that harness the best of both worlds. QML may be young, but its building blocks are already falling into place, outlining the workflows that will power tomorrow's intelligent systems:

- **Quantum Feature Mapping Models:** Transforming classical information into quantum states, enabling richer representations in high dimensional spaces.
- **Model Choice:** It typically follows one of two main paradigms:
 - **Variational Quantum Circuits (VQCs):** Combine quantum feature encoding with trainable quantum ansatzes optimized via classical feedback loops
 - **Quantum Kernel Methods:** Uses quantum circuits to map data into high-dimensional Hilbert spaces and compute kernel matrices, then a classical algorithm uses this matrix for training and prediction.
- **Measurement and Readout:** Convert the probabilistic outcomes of quantum circuits into classical values through expectation values of observables or overlap-based kernel evaluations.
- **Classical postprocessing:** Measurement results are aggregated, transformed into probabilities, logits, or similarity scores, and used for tasks like classification or regression.
- **Model Evaluation:** The trained model is evaluated against test data using performance metrics and compared to classical baselines.
- **Deployment and inference:** Optimized VQC parameters or quantum kernel computations are integrated into hybrid workflows to enrich classical AI pipelines, enabling real-world applications.

This hybrid approach ensures practicality leveraging today's noisy quantum hardware without waiting decades for fault-tolerant quantum machines. These building blocks enable workflows where quantum and classical resources complement each other, each doing what they do best.



Scaling Intelligence Responsibly

A quantum boost for AI is not only about speed but also about smarter and more sustainable learning. Quantum-assisted learning could offer energy-efficient alternatives with significant reduction in carbon footprint of large-scale AI models. Further, new architectures enabled by quantum mechanics principles might lead to AI systems that learn with fewer examples, generalize better, and adapt dynamically to new environments.

Challenges Ahead

The major challenges being faced by quantum-enhanced AI are:

- **Hardware Limitations:** Current quantum devices (NISQ era) are noisy and limited in scale.
- **Algorithm Design:** Many quantum algorithms are still theoretical, requiring breakthroughs in practicality.
- **Benchmarking Advantage:** Demonstrating a clear, consistent quantum advantage over classical AI remains an open research question.

Still governments, tech giants, and startups are investing heavily in Quantum AI research, with pilot projects emerging in finance, materials science, and cybersecurity.

Tools Powering Quantum Machine Learning and Quantum-Assisted AI

Tool / Platform	Type	Best For	Ecosystem / Access
Qiskit Machine Learning (IBM)	Quantum SDK + ML module	Variational Circuits, Quantum Kernels	IBM Quantum Experience (cloud + simulators + hardware)
PennyLane (Xanadu)	Hybrid QML framework	Hybrid ML (PyTorch , TF, JAX)	Works with IBM, Rigetti , Xanadu Borealis, AWS Braket
TensorFlow Quantum (TFQ, Google)	ML-first quantum framework	Quantum-classical deep learning	Integrates with Cirq , Google Cloud
Cirq (Google)	Quantum SDK	Circuit simulation, TFQ backend	Google hardware + simulators
D-Wave Ocean SDK	Annealing-focused SDK	Optimization-heavy AI tasks	D-Wave Leap cloud
Amazon Braket	Hybrid cloud platform	Multi-hardware experiments	AWS cloud
Azure Quantum (Microsoft)	Hybrid quantum services	Enterprise-ready workflows	Microsoft cloud

Conclusion

The quantum boost for AI represents more than a performance upgrade, it's a paradigm shift. Hybrid quantum-classical systems could reshape industries by delivering scalable intelligence that is both smarter and more sustainable. From faster drug discovery to optimized supply chains, improved climate models, and advanced threat detection, the opportunities are vast. Just as GPUs ignited the deep learning revolution, quantum computers may provide the decisive leap that propels AI into its next era of growth. The future of AI will not be purely classical or purely quantum, it will be the best of both worlds.

QUANTUM FOUNDATIONS: THE SPARK OF A TECHNOLOGICAL RENAISSANCE

Dr. Manjit Kaur,
Scientist-E,
C-DAC Mohali

Introduction

Quantum technologies are no longer just ideas in science fiction. They are a technological revolution unfolding right now. The field has come a long way in a short span of time going from purely theoretical concepts to superconducting chips that work at cryogenic temperatures (5 -15 milli Kelvin). This article looks at the beginnings of quantum technologies, describing the theoretical breakthroughs and hardware improvements that together make up the current and near-future quantum landscape.

Tracing the Path to Today's Quantum Era

- **Foundations of Quantum Mechanics (1900):** Planck, Einstein, Bohr, Schrödinger, and Heisenberg etc. laid the foundation of quantum mechanics for describing behavior of microscopic particles (atoms, electrons, photons).
- **Formulation of Quantum Mechanics (1920-1930):** Established mathematical framework for phenomena such as superposition and entanglement which later became the foundational basis for quantum technologies.
- **Quantum mechanics turned into Information Science (1970):** Creation of quantum information theory and the discovery of quantum cryptography and teleportation protocols.
- **Quantum Turing machine & Feynman's simulation insights (1980):** Paul Benioff proposed the first theoretical quantum Turing machine. Later, Richard Feynman showed that only quantum computers could simulate complex quantum systems, a task impossible for classical supercomputers.
- **Shor's factoring algorithm unveiled (1994):** It can factor very large numbers exponentially faster than any known classical algorithm. Shor's algorithm threatens to break RSA and other public-key cryptosystems, endangering global data security once large-scale quantum computers emerge.



- **Grover's search algorithm unveiled (1996):** It showed that a quantum computer can find a desired item in an unsorted database in about $\sqrt{N}$ steps—giving a quadratic speedup and challenging the security of symmetric cryptography and password systems.
- **Breakthroughs in Quantum Hardware (2000-2010):** Ion traps, superconducting qubits, photonic circuits, and neutral-atom platforms etc. began demonstrating the feasibility of scalable quantum systems
- **Quantum Advantage reported; major funding starts (2015):** Governments and businesses started big funding programs to move quantum technologies from the lab to real-world systems.
- **Tech giants started offering quantum cloud services, SDKs, and ecosystems (2010-2020)**

The theoretical foundations

Superposition and entanglement

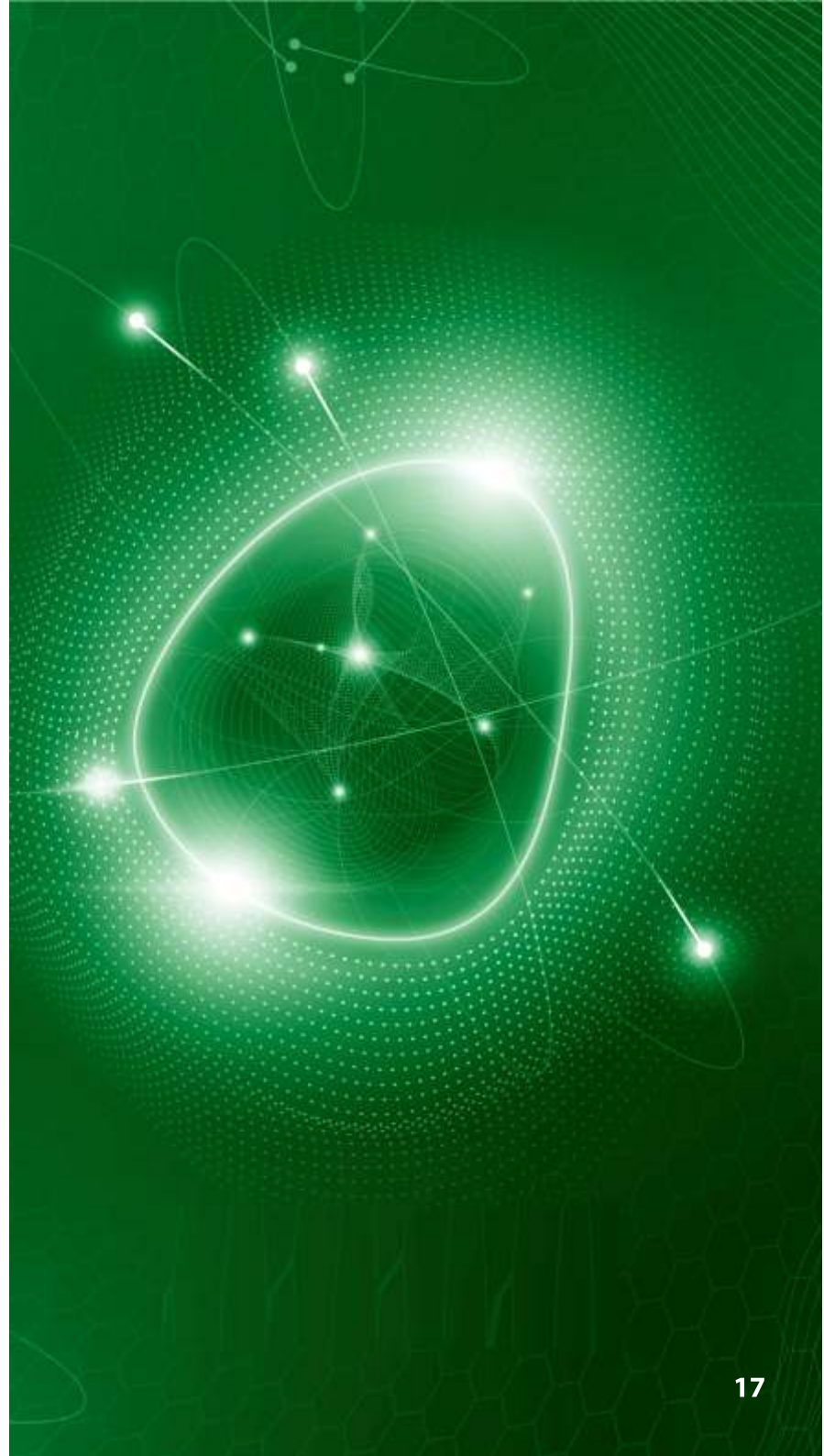
Superposition lets a quantum system be in more than one state at the same time unlocking massive parallelism. This means that a qubit can store more information than a classical bit. Entanglement links the states of separated particles in ways that go against what we would expect from classical physics. This makes quantum teleportation, super dense coding, and entanglement-based cryptography possible.

Quantum information theory

Quantum information theory makes quantum states, quantum channels, and measurements more formal. This framework looks at well-known information tasks like communication, compression, and error correction from a quantum point of view.

Quantum algorithms and complexity

After the invention of Shor's and Grover's algorithms, the pursuit for practical algorithms has grown to include quantum simulation of materials and chemistry, optimization heuristics, machine learning subroutines, and hybrid quantum-classical algorithms (like VQE and QAOA) that target near-intermediate scale noisy (NISQ) devices.



Quantum error correction and fault tolerance

Quantum devices rely on the states of microscopic particles, which are inherently fragile. Decoherence happens when particles interact with their ambient environments causing superpositions to break down and entanglement to weaken. Quantum error-correcting codes use many physical qubits to encode logical qubits to detect and correct errors without measuring the encoded information directly. Fault-tolerance theory sets the threshold error rates and resource overheads that are needed for large-scale quantum computing, shaping hardware and control requirements.

Hardware foundations: how we build Qubits

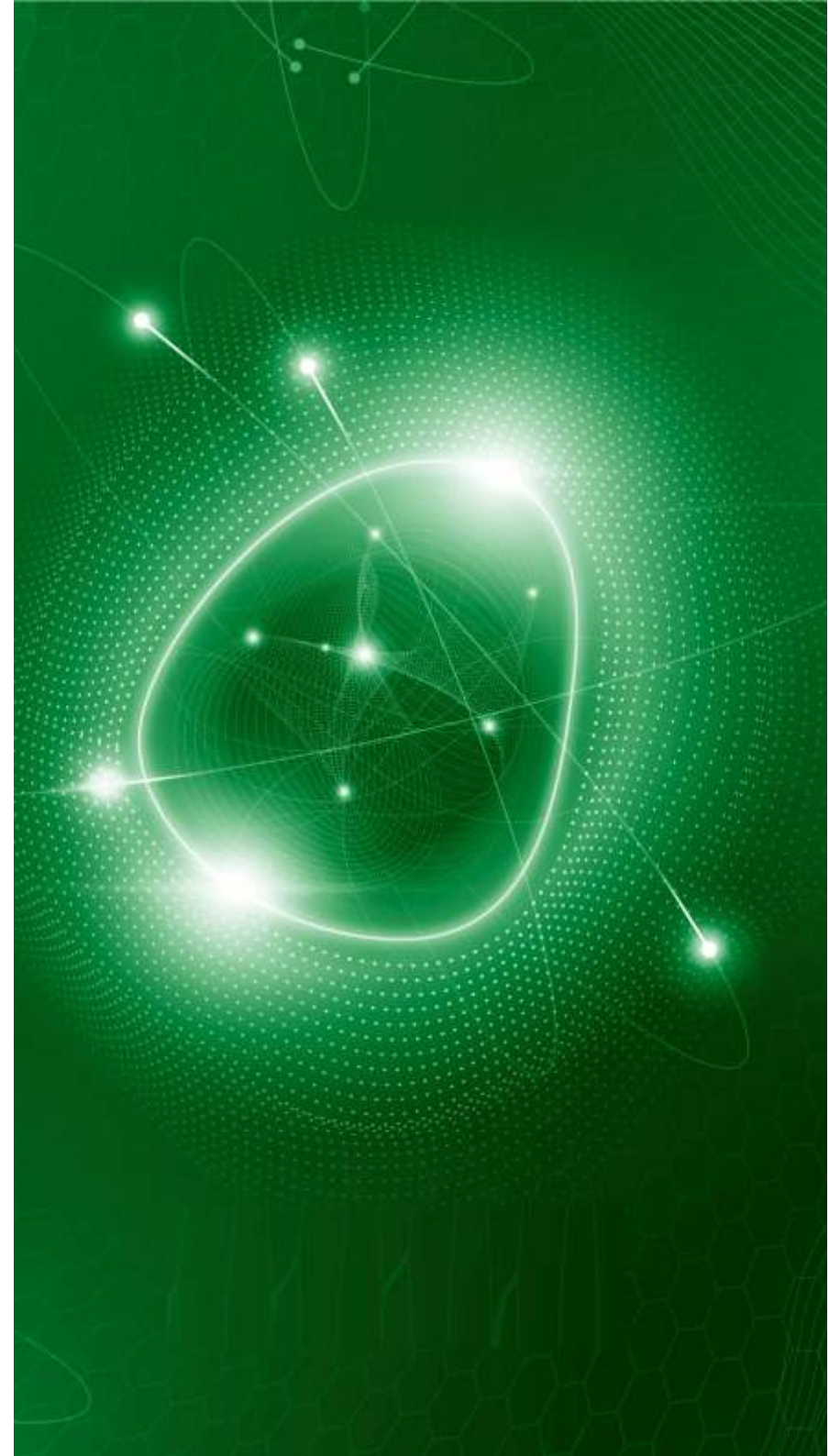
Building qubit devices is no small feat. Every qubit must be precisely controlled, preserve its delicate quantum state, and interact seamlessly with other qubits to enable scalable computing. Several physical platforms have been developed each with unique strengths and challenges in terms of coherence times (how long a qubit retains its quantum state), gate fidelities (accuracy of quantum operations), scalability (ability to increase qubit count), and connectivity (how easily qubits interact). The major architectures anchoring quantum hardware today are:

Superconducting Qubits

Superconducting circuits built from microwave resonators and Josephson junctions are today's most commercially advanced quantum hardware. They operate at millikelvin temperatures inside dilution refrigerators and offer faster gates, lithographic fabrication compatibility with silicon technology, and strong coupling for two-qubit gates. But challenges include complex cooling systems and error rates that still call for major correction overhead.

Trapped ions

Trapped ions store qubits in their internal states and are manipulated with lasers. They offer highest single and two-qubit fidelities and long coherence times. The tradeoffs are slower gate speeds and engineering complexity in trapping and complex laser control. Scaling efforts focus on modular trap designs and photonic links.



Photonics

Quantum photonics uses single photons and optical circuits to carry and process information. Photons travel easily through fiber at room temperature making them ideal for communication networks. The big challenge is building reliable two-photon gates, but recent progress in integrated photonics and single-photon sources is accelerating prospects.

Neutral atoms and Rydberg platforms

Imagine holding atoms in place with beams of light, this is how neutral-atom quantum systems work. By exciting them into special 'Rydberg' states, the atoms can interact strongly. Recent experimental systems demonstrate hundreds of addressable qubits with native multi-qubit gates attractive for quantum simulation and certain optimization problems.

Topological qubits and exotic approaches

Topological qubits encode quantum information using non-Abelian anyons like Majorana fermions in 2D materials. Quantum states are manipulated by braiding these particles offering inherent error resistance due to topological protection. Experimental challenges like creating and controlling anyons keep them in early development.

Applications and the near-term landscape

Quantum technologies are unlocking a world of possibilities both for today and tomorrow. In ongoing NISQ era, they are helping us simulate molecules, solve tricky optimization problems, build super-accurate sensors, and secure communications. Down the road, as we create bigger, more reliable quantum systems, they could crack today's encryption, design new drugs and materials, and give AI a massive boost.

Challenges and the road ahead

The road to practical quantum technology is far from smooth. Qubits are still delicate requiring better stability, scalable qubit interconnects, and smarter ways to manage qubit errors. Building reliable large-scale quantum computers also means creating software tools such as compilers, error fixes, and algorithms that can work hand in hand with existing noisy hardware. But it's not just a scientific challenge. Success will also depend on training skilled engineers, setting global standards, preparing for quantum-safe cryptography, and nurturing an ecosystem that can carry quantum ideas from the lab into everyday life.

Conclusion

Quantum technologies are a blend of deep scientific ideas, experiments, and rapid engineering progress. Still there are many hurdles to overcome, yet the pace of discovery suggests that what once seemed like lab curiosities will soon become part of everyday technology. From computing and communication to sensing and security, quantum tools are on track to reshape how we handle information and how we understand the world itself.

IDEAS TO ACTION



NEW MEITY PROJECTS

IDEAS TO ACTION



Name of Project: Privacy Preserving Data Processing and Exchange for Sensitive Data in the National Digital Public Infrastructure

CI: Dr. P R Lakshmi Eswari, Scientist G and Centre Head, C-DAC Hyderabad

Co-CI: Ms. Jyostna G, Scientist F, C-DAC Hyderabad

Collaborators: IISc Bangalore and IIT Bombay

Brief Description: This project addresses a key missing piece in the development of Digital Public Infrastructure (DPI), namely the ability to use data which may be sensitive or personal to generate public good without violating privacy or security of the underlying data. Such data may be used for analytics, training of AI/ML models, for operational purposes in cities or businesses, or for helping to make government more effective. C-DAC Hyderabad along with C-DAC Bengaluru is executing this project.

NEW MEITY PROJECTS

IDEAS TO ACTION



Name of Project: Pilot deployment of smart phone based blockchain enabled e-voting system

CI: Dr. P R Lakshmi Eswari, Scientist G & Centre Head C-DAC Hyderabad
Dr. Mahesh Uttam Patil, Scientist G, C-DAC Hyderabad
Ms. B Vijayalakshmi, Scientist G, C-DAC Hyderabad
Ms. Jyostna G, Scientist F, C-DAC Hyderabad

Brief Description: The mobile-based e-Voting system offers a secure, inclusive, and tamper-proof digital platform for conducting elections, particularly designed to serve vulnerable and mobile voter groups such as senior citizens, persons with disabilities, pregnant women, and migrant workers. Voters register themselves through a mobile application within the registration period defined by the Administrator. The system ensures voter identity through multi-factor authentication, including EPIC verification, liveness detection and photo matching through the identified 3rd party service, and device binding. The Pilot deployment of the Blockchain based application facilitated Bihar SEC to take up e-Voting on pilot basis in 3 districts (6 Nagarpalikas and 85 wards) for the 3 posts (Ward Councillor, Chief Councillor and Deputy Chief Councillor) for the Nagarpalika Elections 2025. A total of 17960 voters had registered to the system during the registration phase.

NEW MEITY PROJECTS

IDEAS TO ACTION



Name of Project: Startup Challenge to develop Citizen Centric Innovative Solutions using Blockchain and Web3

CI: Ms Radhika Kambham, Scientist F, C-DAC Hyderabad

Co-CI: Ms. Jyostna G, Scientist F, C-DAC Hyderabad

Brief Description: The challenge, aims to leverage the expertise and capabilities of the Indian startup ecosystem towards developing innovative applications to enhance India's digital governance by enabling trust, transparency, and efficiency. It seeks to engage the nation's start-ups in developing innovative blockchain solutions. The challenge invites innovative Web3 and Blockchain application ideas related to Education, Agriculture, Health, Insurance, Tourism etc. 10 winners from different domains would be identified, among 40 applicants. Winners would get an opportunity to host their applications at user agencies/ departments as part of the National Blockchain Technology Stack. Participants are startups, with a focus on fostering innovation, nurturing future leaders, and accelerating national transformation through Web3 and Blockchain technology.

NEW MEITY PROJECTS

IDEAS TO ACTION



Name of Project: Development of Contextual Event Analytics Framework to enhance Security Operations Efficiency through Effective Alert Management System in Next Gen SIEM Solution

CI: Shri Navdeep Singh Chahal, Scientist F, C-DAC Mohali

Co-CI: Smt. Sonia Dosanjh, Scientist F, C-DAC Mohali
Dr. Sanjay Madan, Scientist E, C-DAC Mohali

Brief Description: The project aims to develop the AI-based contextual correlation analysis method for effective alert management in CDACSIEM solution along with the development of predictive AI-models for threat detection, various attack pattern expressions detection using machine learn model with the prioritization for SOC analysts with Indicator of Compromises. The development will involve contextual understanding to recommend related queries, visualization and threat hunting playbooks, making advanced investigation accessible even to less experience analysts while significantly reducing mean time to investigation. This comprehensive framework will empower SOC analysts using CDACSIEM solution to empower the technical capabilities of the cyber security operations.

NEW R&D PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)



5

Name of Project: Development of a portable biosensor platform for the qualitative detection of clinically relevant fungal pathogens

CI: Dr. Subhankar Mukherjee, Project Manager, C-DAC Kolkata

Co-CI: Dr. Souvik Pal, Senior Project Manager, C-DAC Kolkata
Dr. Subrata Sarkar, Scientist E, C-DAC Kolkata

Funding Agency: ICMR

Collaborating Agency(s): IIT, BHU & Raiganj University, West Bengal

Brief Description: Project aims to develop new point of care (PoC) assays (biosensor-based) for rapid and accurate diagnosis of fungal infections caused by *Candida* sp. And *Aspergillus* spp. at low cost and with minimal equipment requirements. The project will be executed through a collaborative framework involving IIT BHU, Raiganj University, and C-DAC Kolkata, each contributing domain-specific expertise. IIT BHU will lead the bioreceptor development for *Aspergillus* species and Raiganj University will focus on similar bioreceptor development activities for *Candida* species. The optimized bioreceptor systems from both institutes will be transferred to C-DAC Kolkata, which will undertake the development of the handheld sensing system for simultaneous detection of *Aspergillus* and *Candida* species. The integrated prototype will undergo extensive laboratory, pre-clinical, and clinical validation, followed by field deployment in mycology centers for real-world performance assessment.

NEW R&D PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)

Name of Project: AI-driven Application for Screening and Early Diagnosis of fungal NTDs/Subcutaneous Mycoses

CI: Shri Samaresh Das, Scientist – D, C-DAC Kolkata

Funding Agency: ICMR

Collaborators: IIT BHU, Raiganj University, AIIMS, Delhi, AIIMS, Bhubaneswar, BHU, Varanasi, AMCH, Dibrugarh, IGMCH, Shimla, NIMS, Telangana, SJMC, Bangalore, AIIMS, Raipur, MMC, Chennai, IPGMER, Kolkata, AIIMS, Jodhpur and KMC, Manipal

Brief Description: The project aims to develop a comprehensive digital solution for monitoring and managing Reported Fungal Infections (RFIs) across India. It includes creating a mobile application that enables field workers to capture patient information and images both online and offline, ensuring seamless data collection in remote areas. A well-annotated image database will be established to support AI model training for automated detection of RFIs. Capacity-building programs will be conducted to train ASHA and Anganwadi workers for effective field-level implementation. Additionally, a web-based analytical dashboard will be developed to visualize and monitor data in real time. The integrated system will also identify regional hotspots and forecast emerging trends, enabling timely public health interventions.

NEW R&D PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)



Name of Project: AI enabled Embedded Autonomous Mission Computer

CI: Shri Arun Gopalakrishnan, Scientist E, C-DAC Thiruvananthapuram

Funding Agency: NIOT, Chennai

Brief Description: The project focuses on the indigenous development of a high-performance embedded computing platform for underwater vehicle systems by C-DAC in collaboration with NIOT. It integrates C-DAC's VEGA processors with the Jetson AGX Orin AI processor to enable advanced data extraction, decoding, and autonomous decision-making capabilities

NEW R&D PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)



Name of Project: Fiber Optic Multiplexer for Underwater Vehicles

CI: Shri Harikrishnan B, Scientist E, C-DAC Thiruvananthapuram

Funding Agency: NIOT, Chennai

Brief Description: This project is for the design and development of indigenous Fiber optic multiplexer for Underwater Vehicles. The fiber optic multiplexer combines multiple video, data, and Ethernet channels into an optical fiber for reliable, long-distance transmission, making it ideal for harsh environments like subsea applications

PROGRESS PULSE:

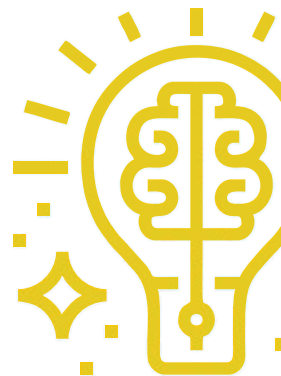
A PERFORMANCE
DASHBOARD



IPR PORTFOLIO

To create awareness and increase the Intellectual Property Rights (IPR) footprint across C-DAC, the Corporate IPR Cell has been established. Details of the IPR activities of C-DAC during this quarter are as below:

IPR portfolio of C-DAC (Year 2013 to September 2025)					Quarterly IPR portfolio of C-DAC (July 2025- September 2025)			
	Patents	Copyrights	Trademarks	Design	Patents	Copyrights	Trademarks	Design
Applied/Filed (Pending)	66	26	37	5	2	6	2	3
Granted/Registered	112	192	24	6	2	3	0	1
Total	178	218	61	11	4	9	2	4



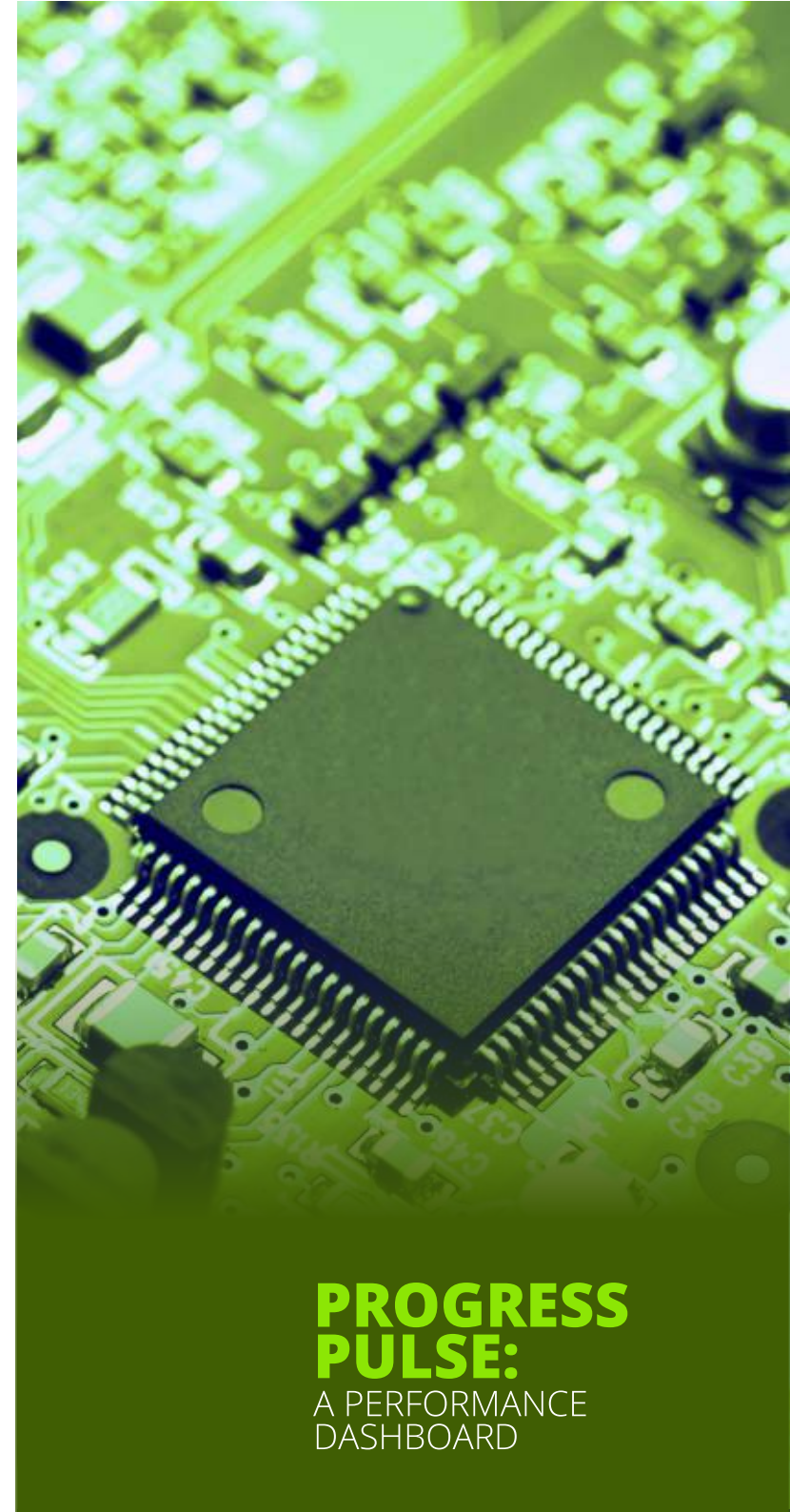
MAJOR PROJECT PERFORMANCE/ STATISTICS

CHIPIN CENTRE - C2S PROGRAMME

C-DAC Bangalore is Programme Coordination Institution (PCI) for overall implementation of the Chips to Startup (C2S) programme. 100 Institutes, 13 Startups /MSMEs have been selected based on Call-For-Proposals. Various FPGA boards identified and recommended by the CEPC were procured and distributed to all participating institutes under C2S Programme.

ChipIN Centre established at C-DAC Bangalore is a common dedicated centralized cloud-supported design facility, not only hosting the EDA tools (from Synopsys, Cadence, Siemens, Xilinx, Ansys and Keysight EDA Tools) for the entire chip design cycle but also provide aggregate services for fabrication of design at Indian foundries, for example, SCL foundry & overseas foundries and packaging.

With approximately 50 more institutions enabled for EDA tool support, the C2S Programme has now empowered a total of 295+ institutions across the country — a significant milestone in strengthening India's semiconductor design ecosystem. EDA Tools from Synopsys, Cadence, Siemens, Xilinx are enabled for these institutions. ChipIN Support Center Web-Portal (<https://chipin.cdacb.in/>) has been enabled for Participating Institutions to make use of the support ticket system in order to streamline ChipIN support requests. A total of 78 online EDA tool training sessions were conducted during the period for participants of the C2S Programme. Over 94 designs submitted for fabrication to SCL as part of MPW Shuttle-I, MPW Shuttle-II, MPW Shuttle-III and MPW Shuttle-IV under C2S Programme. All fabricated and packaged samples of MPW Shuttle-I designs have been dispatched to the respective institutions via courier. Fabricated and packaged samples of eight designs from various C2S institutions (as part of MPW Shuttle-II) were handed over to the respective institutions during the SemiCon 2025 event in New Delhi.



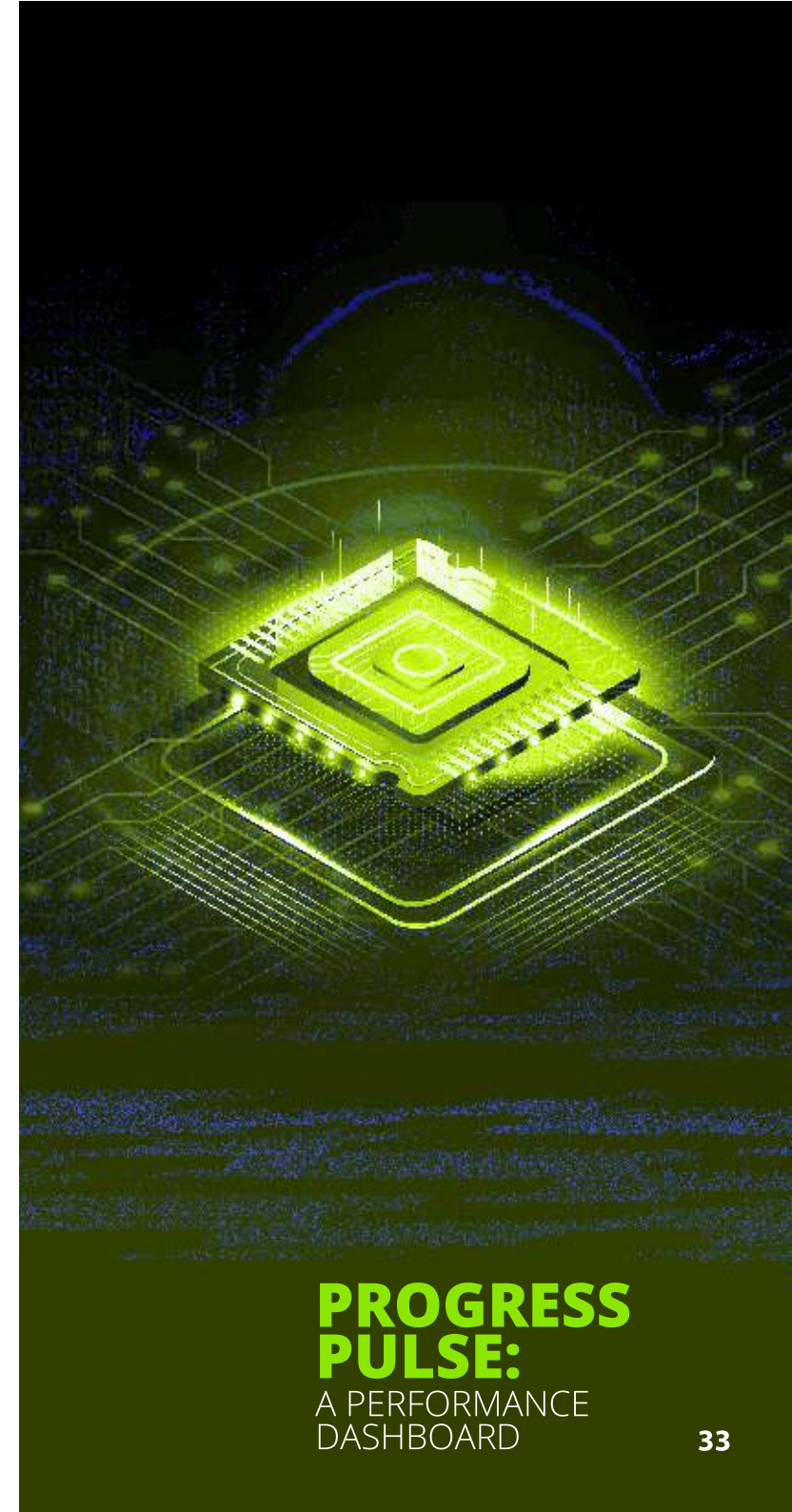
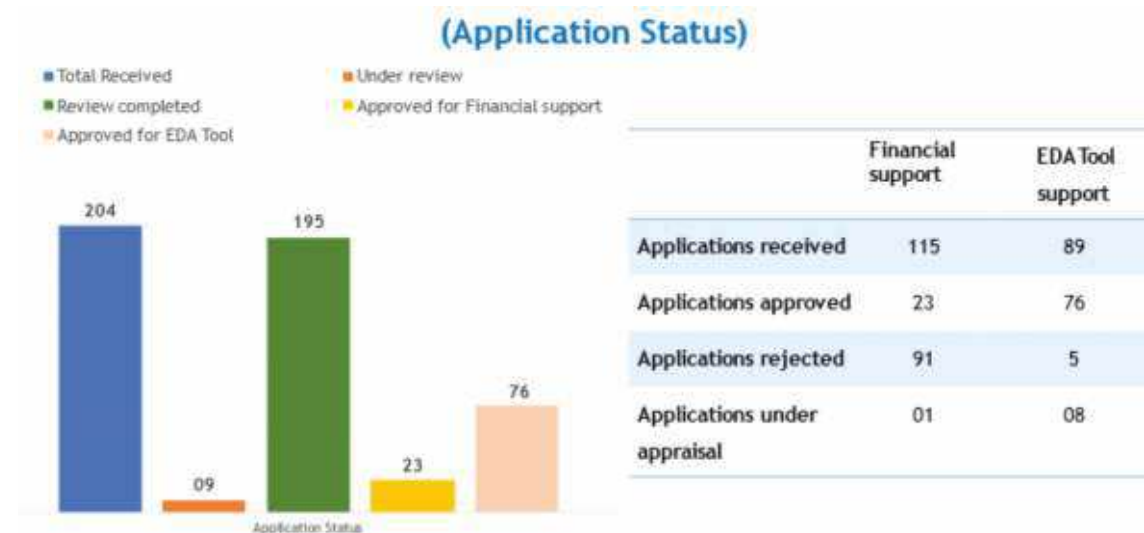
MAJOR PROJECT PERFORMANCE/ STATISTICS

DESIGN LINKED INCENTIVE SCHEME (DLI)

The Design Linked Incentive (DLI) Scheme aims to provide financial incentives as well as design infrastructure support across various stages of development and deployment of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design with an aim to achieving significant indigenization in semiconductor and electronic products and IPs deployed in the country, thereby facilitating import substitution and value addition in electronics sector in the next 5 years. The major objectives are:

- Nurturing domestic companies of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.
- Achieving significant indigenization in semiconductor and electronic products and Ips deployed in the country, thereby facilitating import substitution and value addition in electronics sector in the next 5 years.
- Strengthening the design infrastructure through incubators for semiconductor design and facilitating access to startups and MSMEs.

Design Linked Incentive (DLI) Status



MAJOR PROJECT PERFORMANCE/ STATISTICS

OUTCOMES ENVISAGED

Company Name	IPs Generated	Designs Taped Out	ASICs Fabricated	Manpower Generated	Patents Achieved
Vervesemi Microelectronics Private Limited (202200051)	11	1	1	30	0
Fermionic Design Private Limited (202200030)	13	1	1	24	0
DV2Js Innovation (202200024)	0	2	1	19	0
Morphing Machines Private Limited (202200060)	0	0	0	9	0
Netrasemi Private Limited (202200049)	17	0	0	56	2
Calligo Technologies Private Limited (202200002)	01	1	1	45	1
Aheesa Digital Private Limited (202200017)	11	1	0	26	0
Saankhya Labs Private Limited (202200033)	03	0	0	15	0
Sensemi Technologies Private Limited (202200090)	14	0	0	30	4
GreenPMU Private Limited (202200041)	16	4	1	40	3
WiSig Networks Private Limited (202200077)	0	0	0	23	0
MosChip Technologies Limited (202200102)	13	1	1	70	0
Mindgrove Technologies Private Limited (202300004)	0	0	0	35	0
InCore Semiconductors Private Limited (202400033)	0	2	0	22	0
BigEndian Semiconductors Private Limited (202400060)	01	0	0	38	0
C2i Semiconductors Private Limited (202400100)	07	0	0	30	0
MBit Wireless Private Limited (202400116)	01	0	0	80	0
Incise Infotech Limited (202200031)	01	0	0	09	0
TOTAL	110	13	6	601	10



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

MOBILE SEVA (MOBILE SERVICE DELIVERY GATEWAY)/ MOBILE SEVA APPSTORE

Mobile Seva platform is an innovative initiative aimed at mainstreaming mobile governance in the country. It provides an integrated whole-of-government platform for all Government departments and agencies in the country for delivery of public services to citizens and businesses over mobile devices using SMS, IVRS, CBS, LBS, apps. It is a centrally hosted cloud-based mobile enablement platform, which allows the departments to expeditiously start offering their services through mobile devices anywhere in India, without having to invest heavily in creating their separate mobile platforms. Over 4844 accounts of government departments and agencies with over 6746 cr+ transactions are integrated with Mobile Seva platform.

Mobile Seva Platform		
	April 2012 to September 2025	July 2025 to September 2025
Accounts of Dept/Agencies integrated	4896	52
No of Push SMS Transaction	6920 Crs	177 Crs



मोबाइल
Mobile Seva

**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-HASTAKSHAR / E-SIGN

As a flagship initiative within the Government's Digital India program, C-DAC has introduced e-Hastakshar, a cutting-edge eSign service that allows citizens to digitally sign documents online in real-time, providing a legally acceptable form and convenient alternative to physical signatures. Over the past year, C-DAC integrated this service with various departments, ministries, and agencies at the Central and State Government levels, as well as Union Territories. C-DAC utilizes service of Unique Identification Authority of India (UIDAI) for on-line authentication and Aadhaar eKYC service. e-Hastakshar service supports Online Aadhaar Authentication Modes - One-time password (OTP), TOTP, Fingerprint, IRIS, Face (Mobile Apps only) based modes of authentication for leveraging eKYC service of UIDAI.

As of September 2025, C-DAC has issued over 30.58 Cr e-Signs. More than 295 government agencies are utilizing C-DAC's eSign service at the production level. Recently, the Election Commission of India (ECI) has integrated e-sign service on its ECINET portal in the voter registration process, along with the several key new clients have also been onboarded at the production level to leverage the service, including the High Courts of Madhya Pradesh, Uttarakhand, and Kerala, Tata Memorial Hospital, Mumbai, the Securities and Exchange Board of India (SEBI), and the Border Roads Organisation (BRO), New Delhi. In continuation, key agencies such as the Andhra Pradesh IT Department, the Centre for e-Governance, Karnataka, Madhya Pradesh Agency for Promotion of Information Technology, Directorate of Enforcement (ED) and National Informatics Centre are leveraging eSign at the production level.

eSigns offered by C-DAC	
July 2016 to Sep 2025	July-Sep 2025
30.58 Crs	2. 31 Crs



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

ESANJEEVANI

eSanjeevani, the flagship telemedicine platform of the Ministry of Health & Family Welfare, Government of India, is the world's largest telemedicine initiative in primary care. By harnessing digital technology, it has revolutionized healthcare delivery, enabling seamless access to quality medical consultations for underserved populations, especially in rural and remote areas.

Operating through a vast, integrated network, eSanjeevani connects over 1.36 lakh Ayushman Arogya Mandirs (AAMs) as spokes to more than 17,800 hubs, additionally extended to over 312 correctional facilities, supported by over 2.28 lakh doctors, specialists, and healthcare professionals across all States and Union Territories. Till September 2025, eSanjeevani has facilitated over 41.75 crore consultations — completely free of cost — bridging critical healthcare gaps for rural communities, women, senior citizens, and marginalized groups. Notably, more than 57% of consultations are availed by women and 13% by senior citizens, with services available in 12 Indian languages.

Delivering an average of 4 lakh consultations daily, peaking at 6.3 lakh, and with a capacity of up to 10 lakh per day, eSanjeevani exemplifies scalability and innovation. It strengthens primary care, reduces hospital congestion, institutionalizes digital health records, and ensures continuity of care. By making healthcare accessible, affordable, and equitable, eSanjeevani is not only transforming India's health system but also setting a global benchmark in telemedicine — a true testament to the power of digital health in shaping the future of healthcare.



MAJOR PROJECT PERFORMANCE/ STATISTICS

ESANJEEVANI

eSanjeevani Usage Report				
	November 2019 to September 2025		July 2025 – September 2025	
	Total Tele-Consultations	Registered Doctors	Total Tele-Consultations	Registered Doctors
eSanjeevaniAB- HWC	40,47,87,189	60,228	2,25,64,942	3,126
eSanjeevaniOPD	1,27,57,282	12,818	1,98,785	337
eSanjeevani	41,75,44,471	73,046	2,27,63,727	3,463



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-SUSHRUT – HOSPITAL MANAGEMENT INFORMATION SYSTEM

C-DAC's "e-Sushrut", a Hospital Management Information System (HMIS) is a major step towards adapting technology to improve healthcare. Its main objective is to provide healthcare services to the masses by leveraging computing power at low cost. The beneficiary hospital shall use the Hospital Management Information System (HMIS) as a service and shall not undergo the challenges posed by technology, administration, and implementation in computerization. e-Sushrut, Hospital Management Information System (HMIS) was initiated as a solution for digitization of clinical and back-office workflows in a hospital or medical facility. e-Sushrut incorporates an integrated computerized clinical information system for improved hospital administration and patient healthcare. It provides an accurate, electronically stored medical record of the patient.

In its present incarnation as e-Sushrut G6i, it supports diverse workflows with the broad objective of enabling standardized and efficient healthcare service delivery at all levels (Medical College Hospitals, DHs, CHC, and PHCs).

With the launch of Ayushman Bharat Digital Mission – ABDM, e-Sushrut is one of the first application compliant to ABDM Building Blocks and has achieved all three milestones. ABDM not only enables e-Sushrut to exchange the Electronic Medical Records among hospitals but also create the repository of clinical data. A data warehouse of such records enables opportunity to analyse and interpret the data, enabling the predictive analysis in the health domain, assisted by artificial intelligence and machine learning components.

Over the years, e-Sushrut has evolved as a comprehensive HMIS ERP solution to support multiple state-wide implementations as well as super specialty hospitals requirements.



MAJOR PROJECT PERFORMANCE/ STATISTICS

E-SUSHRUT – HOSPITAL MANAGEMENT INFORMATION SYSTEM

Type	Project Name	No. of Patient Visited		No of Facilities	
		Till Jun 2025	Jul 25- Sep 25	Till Jun 2025	Jul 25- Sep 25
Super Specialty	e-Sushrut for AIIMS	3,32,63,642	36,59,421	17	0
Super Specialty	IGIMS Patna	16,62,763	3,26,714	1	0
Super Specialty	GIMS	8,57,429	1,16,268	1	
Super Specialty	PGIMER	3,27,63,440	7,47,501	0	
Super Specialty	NIMS HMIS Hyderabad	48,06,921	2,42,761	1	
State-wide	HMIS-NHM UP	2,77,12,192	50,27,001	439	29
State-wide	HMIS- DGME UP	1,82,33,160	29,84,969	22	
State-wide	Punjab	9,79,09,121	96,55,730	3706	22
State-wide	Telangana	3,16,47,721	46,14,440	97	0
State-wide	Odisha	50,31,389	67,61,484	1294	3
State-wide	HMIS Maharashtra	2,11,48,393	54,56,915	1311	1131
State-wide	HMIS HP	35,24,267	15,96,372	43	2
State-wide	HMIS TN	31,92,421	27,88,298	154	341
State-wide	Goa State	27,94,437	6,07,890	46	0
State-wide	Arunachal Pradesh	20,02,891	1,92,925	58	0
State-wide	Sikkim	10,52,019	2,09,484	12	2
PSU	e-Sushrut PAN Railways HMIS	5,06,08,205	52,98,650	709	0
PSU	SAIL BSL e-Sushrut HMIS	15,601	75,762	13	0
PSU	SAIL RSP e-Sushrut HMIS	4,85,171	1,24,033	6	0
PSU	SAIL BGH e-Sushrut HMIS	11,58,454	1,60,130	12	0
PSU	NHPC	2,88,640	25,964	31	1
PSU	CGHS's	0		490	
Microsites	e-Clinic			0	
	Total	34,01,58,277	5,06,72,712	8,463	1,531



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-RAKTKOSH – CENTRALIZED BLOOD BANK MANAGEMENT SYSTEM

e-RaktKosh is a comprehensive IT solution to connect, digitize and streamline the workflow of blood banks. It has on-boarded more than 4400 blood banks on its platform. e-RaktKosh Portal is also extensively used by the citizens for requirements related to blood, blood banks' location identification, blood stock Enquiry, maintenance of donation repository etc. eRaktKosh is integrated with various state-wide blood bank solutions & has become a single data repository for management of data regarding blood availability, blood-related products, blood donation camps, donor repository etc.

eRaktkosh		
Description	Year 2017 to September 2025	July 2025 to September 2025
Total Blood Center Registered	4,458	90
Total Govt Blood Center Registered	1,282	05
No of Active Blood Centers	3,660	3,660
No of Blood Donation Camps	2,11,881	27,089
No of Donors Registered	1,04,75,017	5,57,062



MAJOR PROJECT PERFORMANCE/ STATISTICS

NHSRC PROJECT – QUALITY CERTIFICATION SYSTEM FOR PUBLIC HEALTH FACILITIES

NHSRC Project is a flagship initiative undertaken by C-DAC Noida in collaboration with the National Health Systems Resource Centre (NHSRC) to design and implement a comprehensive digital platform for Quality Certification of public health facilities across India.

This system enables the end-to-end management of the certification lifecycle, including:

- Application submission
- Assessment workflows
- Document verification
- Automated scoring
- Result declaration

It provides a centralized, role-based platform that brings together key stakeholders such as hospitals, assessors, quality officers, and administrative authorities, ensuring seamless coordination and transparency.

The platform supports multiple types of certifications, including:

- National Certification (NQAS)
- State-level Certification
- Internal Assessments
- Surveillance and Re-certification Processes

By digitizing these critical processes, the NHSRC Quality Certification System enhances operational efficiency, promotes standardization, ensures data integrity, and facilitates real-time monitoring and data-driven decision-making across India's public healthcare landscape. Since being LIVE in July 2023, the following is the National Level Certification Status.



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

NHSRC PROJECT – QUALITY CERTIFICATION SYSTEM FOR PUBLIC HEALTH FACILITIES

	States On-Boarded	User Registration	External Assessors On-Boarded	NHSRC Consultant	Facilities	State Users
July-2023 to Sep-2025	36	76052	2252	58	72604	1123
July-2025 to Sep 2025		3422	180	9	3214	19

Total Application Count July 2023 to Sep 2025 – 36420			Jul 2025 to Sep 2025
Facility Type-wise Statistics	District Hospital (DH)	510	25
	Sub-District Hospital (SDH)	338	19
	Community Health Center (CHC)	747	34
	Primary Health Center (PHC)	4111	273
	Urban-PHC	1412	85
	Health & Wellness Center (HWC)	28922	2802
	Medical College Hospital	59	8
Certification Type – wise Statistics	NQAS	35539	3949
	LaQshya	652	82
	MusQan	229	33
Result Declared - 19205			84



MAJOR PROJECT PERFORMANCE/ STATISTICS

MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES (MUHS) – UNIVERSITY AUTOMATION SYSTEM

MUHS Project, undertaken by C-DAC Noida, focuses on end-to-end digital transformation of academic, administrative, and regulatory processes at the Maharashtra University of Health Sciences (MUHS). The project encompasses the design and development of a comprehensive University Automation System covering modules such as Admissions, Eligibility, PhD, SIP, Court Cases, HR, Affiliation, and more. Built from the ground up, the system is tailored to the unique functional workflows of MUHS, ensuring efficiency, transparency, and ease of use for all stakeholders. With active engagement from University departments and continuous collaboration, the project has already achieved significant milestones, with several modules successfully made live. Ongoing efforts are now directed toward completing the remaining components and addressing department-specific requirements to fully operationalize the entire system.



Major Statistics	Details
No. of Modules	12
Colleges On Boarded	682
University Employees On Boarded	344
Teachers On Boarded	24,000
Students On Boarded	2,50,000

**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-STUDENT LIFE CYCLE MANAGEMENT SYSTEM (E-SLCMS)

e-SLCMS is a cutting-edge web application designed to manage the entire journey of a student within a health education institute. It covers every phase, from admissions to alumni engagement, offering a centralized platform to integrate isolated departmental functions.

By uniting departments that often function independently, the system fosters better coordination and communication across the institution. This integration not only boosts operational efficiency but also reduces administrative complexities, thereby enriching the overall student experience in medical schools.

In addition, the system comes with a mobile app that offers even more benefits. It enhances the student learning experience by simplifying access to essential information and services, encouraging collaboration, and supporting students throughout their academic journey. This streamlined approach helps improve student engagement and success.

e-Student Life Cycle Management System (e-SLCMS) has been deployed at

- All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha
- Mahatma Gandhi Institute of Medical Sciences (MGIMS), Wardha, Maharashtra
- Ispat General Hospital (IGH), Steel Authority of India Limited (SAIL) Rourkela, Odisha
- Directorate of Medical Education & Research (DMER), Maharashtra



MAJOR PROJECT PERFORMANCE/ STATISTICS

E-STUDENT LIFE CYCLE MANAGEMENT SYSTEM (E-SLCMS)

Institute/Activity → ↓	Total College Configura tion	Total Course Register	Course Registered with Specialization	Number of Students Registered
All India Institute of Medical Sciences (AIIMS) Bhubaneswar, Odisha	2	4	17	617
Ispat General Hospital, Steel Authority of India Limited (SAIL) Rourkela, Odisha	2	4	17	348
Mahatma Gandhi Institute of Medical Sciences (MGIMS), Wardha, Maharashtra	3	6	25	4931
DMER, Maharashtra	65	46	80	13855



MAJOR PROJECT PERFORMANCE/ STATISTICS

FUTURESKILLS PRIME (PROGRAMME FOR RE-SKILLING/UP-SKILLING OF IT MANPOWER FOR EMPLOYABILITY)

The Ministry of Electronics and Information Technology (MeitY) in association with NASSCOM has launched the FutureSkills PRIME (FSP) program, a pivotal initiative aimed at enhancing skills and knowledge in emerging technologies viz, Additive Manufacturing/3D Printing, Artificial Intelligence, Augmented/Virtual Reality, Big Data Analytics, Blockchain, Cloud Computing, Cyber Security, Internet of Things, Robotic Process Automation, Social & Mobile etc. The detail of the program is available in the <https://futureskillsprime.in> portal.

The FSP program provides reskilling/upskilling and experiential learning in disruptive technologies, through strategic partnerships with C-DAC/NIELIT Centers, Industries, Academia, Professional Bodies etc. FutureSkills PRIME activities involve Training Program in Emerging Technologies for Students & professionals, industry relevant Courses, to address the skill gap in niche technology areas. As part of phase 2, FSP aims to train around 10 Lakh Beneficiaries including career aspirants, employment seekers, non-IT employees in cross-pollinated digital roles, PSE employers, and IT employees across IT and non-IT sectors over the period of 3 Years through variety of Courses including (a) Bootcamp Courses (BCMP), (b) Government Officer Training- Basic (GOT-B), and (c) Government Officer Training – Advanced (GOT-A), (d) Deep Skilling, (e) Foundational (f) Experiential Learning.

As part of 1st Year of Phase 2 of FSP, overall, 38,453 Beneficiaries were from Bootcamp and GOT Programs conducted by C-DAC/NIELIT Ecosystem. Further, a total of 44 courses were developed under all technologies for Bootcamp, GOT-Basic and GOT-Advanced.



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

FUTURESKILLS PRIME (PROGRAMME FOR RE-SKILLING/UP-SKILLING OF IT MANPOWER FOR EMPLOYABILITY)

Category/ Activity	Agency	1 st April 2024-31 st July 2025	1 st July 2025-30 th September 2025	Total Achievement
Government Training – Advanced	C-DAC/ NIELIT	3717	1567	5284
Government Training – Basic		3826	1893	5719
Bootcamp		19999	7451	27450
TOTAL LEARNERS		27542	10911	38453

- Over 56 webinars have been conducted, 82+ PSUs have undergone skilling, and 60+ universities have been engaged till date.

State-Wise Learner's Engagement

States	No of Learner's certified under FSP
Telangana	1987
Assam	999
Bihar	1265
Delhi	2327
Jammu & Kashmir	737
Karnataka	1067
Kerala	2028
Maharashtra	9270
Manipur	803
Nagaland	576
Punjab	2840
Sikkim	914
Tamil Nadu	3132
Tripura	2079
Uttar Pradesh	2816
West Bengal	5613



MAJOR PROJECT PERFORMANCE/ STATISTICS

IPDMS 2.0, INTEGRATED PHARMACEUTICAL DATABASE MANAGEMENT SYSTEM 2.0

The Integrated Pharmaceutical Database Management System (IPDMS) 2.0 is a responsive, web-based application developed for the National Pharmaceutical Pricing Authority (NPPA). It streamlines and integrates the core functional processes necessary for monitoring and regulating the prices of drugs and medical devices.

Established on 29th August 1997 by a Government of India Resolution, the NPPA functions as an attached office under the Department of Pharmaceuticals (DoP), Ministry of Chemicals and Fertilizers. It is entrusted with the independent mandate of regulating drug pricing—including medical devices—to ensure their availability at affordable rates.

IPDMS 2.0, together with the Pharma Sahi Daam 2.0 mobile application (available on both Android and iOS platforms), provides users with real-time access to the prices of Scheduled and Non-Scheduled medicines at the point of purchase. Additionally, the Pharma Jan Samadhan platform offers a user-friendly interface for lodging and tracking four categories of complaints: overcharging, sale without prior approval, shortage or unavailability of medicines, and refusal to sell drugs. This complaint redressal mechanism is seamlessly integrated into both the Pharma Sahi Daam mobile app and the IPDMS 2.0 web portal.

The calculation of ceiling and retail prices of drugs, along with the associated overcharging workflows, has been automated and integrated into the IPDMS 2.0 application. These workflows are linked with 32 State Price Monitoring and Resource Units (PMRUs). Individuals can verify ceiling prices and register overcharging complaints directly through the mobile applications.



MAJOR PROJECT PERFORMANCE/ STATISTICS

IPDMS 2.0, INTEGRATED PHARMACEUTICAL DATABASE MANAGEMENT SYSTEM 2.0

Integration Pharmaceuticals Database Management System, IPDMS 2.0		
Activities done by Pharma/Medical Devices Companies & NPPA	till 30 th Sept 25	July 2025 - Sept 2025
Total Companies (Drugs & Medical Devices) Registered in the IPDMS 2.0	1818 (1587- Drugs, 231 - Medical Devices)	140 (98 - Drugs, 42 - Medical Devices)
Number of Manufacturing Unit verified by the companies	8388	423
Number of Drugs verified by companies	64983	4672
Medical Devices Plant Registered	792	93
Medical Devices Registered	105178	41006
Quarterly Stock Collection	24749	1907
State Pricing Monitoring Resource Unit (PMRU) registered.	32	0
Form-I (Application for Price Fixation) Submitted	928	72
Form-II (Submission of Revised Prices) Submitted	23654	819
Form-III (Quarterly Return) Submitted	76437	8691
Form-IV (Discontinuation of Production) Submitted	147	7
Form-V (Price List) Submitted	119657	26963
Form – VI (Medical Devices) Submitted	95864	36305
Complaints Registered through Web and Mobile Apps	7162	460
Legal Cases Registered for Overcharging	827	37



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

SWAYAAN: CAPACITY BUILDING FOR HUMAN RESOURCE DEVELOPMENT IN UNMANNED AIRCRAFT SYSTEM

The project, titled 'SwaYaan – Capacity Building for Human Resource Development in Unmanned Aircraft Systems (UAS)/Drone & Related Technology,' is jointly led by C-DAC Hyderabad and IIITDM Kurnool, serving as the Programme Management Unit (PMU). Its mission is to foster the development of a comprehensive UAS/Drone ecosystem across the country. The initiative follows a hub-and-spoke model, involving 30 institutions including IISc, IITs, IIITs, NITs, IIITDM, CDAC & NIELIT centers and Industry Stakeholders namely SSCs, FICCI, DFI.

The project aims to train over 42,000+ candidates within five years through a diverse range of formal and non-formal programs and research initiatives. These include MTech programs in UAS/Drones, minor degrees and retrofitting courses, 6 months certificate program, skilling courses, innovation challenges, bootcamps, proof-of-concept projects, national workshops, faculty development programs, international conferences, open online courses, and intellectual property creation (papers and patents).

To date, 776 activities have been conducted nationwide, encompassing academic, research & innovation, skilling & training, and other knowledge-sharing initiatives. These efforts have benefited 23,026 participants, accelerating India's progress toward becoming a global drone hub by 2030.



MAJOR PROJECT PERFORMANCE/ STATISTICS

SWAYAAN: CAPACITY BUILDING FOR HUMAN RESOURCE DEVELOPMENT IN UNMANNED AIRCRAFT SYSTEM

Program Name	Activity: 2022-2025			Participants: 2022-2025		
	January 2022 – June 2025	July 2025- September 2025	Total	January 2022 – June 2025	July 2025- September 2025	Total
FDP	22	2	24	545	40	585
Workshop	10	0	10	779	0	779
Bootcamp	437	42	479	16412	2284	18696
PG-Diploma	6	1	7	25	30	55
POC	117	0	117	650	0	650
Skilling Courses	6	2	8	179	61	240
National Competition	0	1	1	0	200	200
M-Tech	2	1	3	23	14	37
Minor Degree	4	1	5	66	8	74
Retrofitting Electives	61	0	61	1504	0	1504
IPR-Paper	44	5	49	158	15	173
IPR-Patent	7	3	10	19	14	33
Open Online Course	0	1	1	0	0	0
International Conference	0	1	1	0	0	0
Total	716	60	776	20360	2666	23026



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

SWAYAAN: CAPACITY BUILDING FOR HUMAN RESOURCE DEVELOPMENT IN UNMANNED AIRCRAFT SYSTEM

Major Highlights

- In the 3rd quarter of 2025, SwaYaan contributed over 60+ activities across 14 categories of programs, benefiting more than 2,600 individuals and reaching a total of over 23,000 beneficiaries till date.
- As part of the 10 Years of Digital India celebration, a special session "Ask Our Experts" was streamed live on YouTube on 18th July 2025, highlighting the active engagement of SwaYaan beneficiaries who contributed their insights and experience. Session link: <https://www.youtube.com/live/5jJ2AGMoV88?si=C0VZET6t4WCYniDh>

Research & Innovation

- India's largest 'National Innovation Challenge for Drone Application and Research (NIDAR)' has received overwhelming participation, with over 350 teams and more than 3,200 participants.
- The First International Conference on ETAAV (Emerging Technology in Autonomous Aerial Vehicles) was held from 18th to 20th August 2025 at IISc Bangalore, co-sponsored by IEEE Bangalore Section, VTS, and AESS Chapters. The conference featured 350+ research submissions with a 60 accepted papers, covering 9 technical domains. The event registered plenary talks and tutorials by global experts and leading faculties, an EO-IR Object Detection Challenge on Kaggle with 200+ teams, and participation from over 26 institutions across academia, research, and industry.
- A total of 57 Proof-of-Concepts in Drone/UAS have been completed across 26 institutions, resulting in the development of 28 hardware models, 17 software solutions, 13 algorithms, 24 IPR outputs (including papers and patents), 6 thesis, 2 book chapters, and 6 working prototypes.
- Three patents and five publications have been accomplished, involving over 30 researchers.

Academic Activities

- Minor Degree on 'Unmanned Aerial Systems and Applications' is ongoing with 8 Beneficiaries.
- IISc Bangalore launched a 12-week NPTEL open online course titled "Drone Systems and Control" in July 2025, attracting 8,403 learners and 1,625 exam registrations.
- Three batches of six-month certificate courses are currently in progress, with over 85 participants enrolled across programs such as the 'PG-Diploma in UAS Programming (August 2025 batch)' and the '900-hour UAS Developer Certificate Course'.

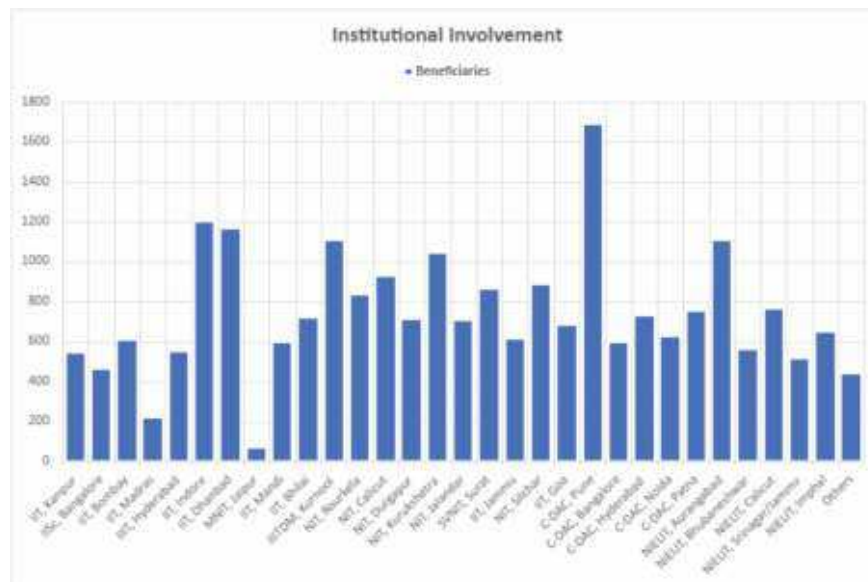
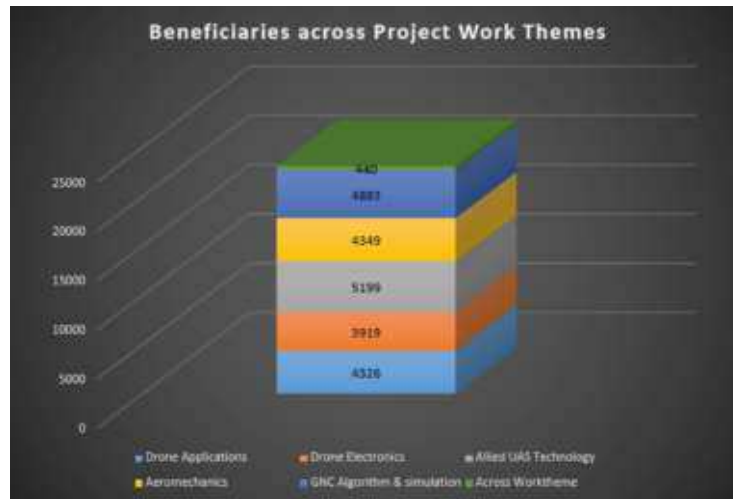
Training & Skilling

- 42 Bootcamps in Drone/UAS conducted across 17 cities marking participation by 2,284 Students
- Phase I of Job role-based skilling courses on 'Drone Data Processor' by the Telecom Sector Skill Council and 'Junior Engineer – Drone (R&D)' by Electronics Sector Skills Council of India has been successfully completed, training 175+ participants respectively across 3 centres.
- Phase II of New Job Role based Skilling course on 'Junior Engineer Drone (R&D)' by Electronics Sector Skills Council of India initiated with 61 participants across 2 Centres



MAJOR PROJECT PERFORMANCE/ STATISTICS

SWAYAAN: CAPACITY BUILDING FOR HUMAN RESOURCE DEVELOPMENT IN UNMANNED AIRCRAFT SYSTEM



**PROGRESS
PULSE:**
A PERFORMANCE
DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

INFORMATION SECURITY EDUCATION AND AWARENESS (ISEA) PROJECT PHASE –III

Information Security Education and Awareness (ISEA) is a Ministry of Electronics and Information Technology (MeitY), Govt initiative. The ISEA Project has been designed with a targeted approach for development of human resources for safe, trusted and secure cyber space. The project implemented through 50 premier academic institutions at National level. The Centre for Development of Advanced Computing (C-DAC), Hyderabad is Project Management Unit for implementing this initiative.

Generating highly skilled & certified Cyber Security Professionals – CISOs

CISO component of ISEA Project, A total of 26 training and certification programs have been conducted till date with more than 739 professionals being trained in various specialised domains of various levels and 232 Professionals certified as Associate Team of CISOs covering PSUs, Government, IT/ITES, and Pvt sectors across India. A Total of 6 Training and certification programs have been successfully conducted during the period.

Capacity Building, Academic, Ideation and Innovation Activities

4 Faculty Development Programs covering 100 candidates, One short term program on AI driven secure critical infrastructure covering 53 candidates, 2 bootcamps covering 70 students and Series of Fire Side Chats on Rise of AI-based Cybersecurity Attacks covering 220 candidates were conducted during the period.



MAJOR PROJECT PERFORMANCE/ STATISTICS

INFORMATION SECURITY EDUCATION AND AWARENESS (ISEA) PROJECT PHASE –III

Mass Awareness

The Cyber Aware Digital Naagrik programme, an integral part of the ISEA initiative, aims to cultivate a cybersecurity-conscious citizenry. By delivering targeted awareness campaigns, user engagement activities, and role-specific training programmes to diverse demographics, including students, women, and government employees, the programme seeks to enhance cybersecurity literacy and awareness. Furthermore, the programme provides a foundation for individuals interested in pursuing professional development and career opportunities in the cybersecurity domain. As part of our mass awareness activities, 202 Awareness workshops / Training were organized by covering 43,751 participants.



MAJOR PROJECT PERFORMANCE/ STATISTICS

WORK BASED LEARNING PROGRAMME (WBLP)

The Government of India has introduced several initiatives for SCs, STs, Women, and EWS, including scholarships, coaching, and empowerment schemes. To strengthen their employability in IT and Electronics, the **Work Based Learning (WBL) Programme** was launched in emerging technologies. It is implemented through seven MeitY organizations—CERT-In, C-DAC, NIELIT, STQC, CMET, ERNET, and SAMEER—leveraging their expertise to provide practical exposure and skill development.

The Work Based Learning (WBL) Programme, approved on March 9, 2022, is a transformative initiative designed to empower fresh graduate engineers from Scheduled Caste (SC), Scheduled Tribe (ST), Women, and Economically Weaker Section (EWS) communities. This program provides hands-on practical experience in cutting-edge fields such as Information Technology, Electronics, and related disciplines, with a focus on addressing the socio-economic challenges faced by these groups. By offering exposure to state-of-the-art technologies, the WBL Programme equips candidates with essential skills, including technical knowledge, real-time working capabilities, critical thinking, problem-solving, analytical reasoning, and interpersonal communication. Implemented across seven Ministry of Electronics and Information Technology (MeitY) organizations—CERT-In, C-DAC, NIELIT, STQC, CMET, ERNET, and SAMEER—the program bridges the gap between academic learning and professional environments.

The objectives of the WBL Programme are multifaceted. It facilitates a smooth transition from college to the corporate world by providing real-time exposure to niche technological projects. The program reduces the "deployable time" for both candidates and prospective employers by offering practical experience in design, development, requirement analysis, testing, and standardization. It also enhances professional skills such as problem-solving, communication, presentation, confidence, and enterprise etiquette. Key technologies covered include Artificial Intelligence (AI), Machine Learning, Robotic Process Automation (RPA), Quantum Computing, Augmented Reality & Virtual Reality (AR/VR), Blockchain, 5G and Wi-Fi 6, Smart Mobility, Internet of Things (IoT), Cyber Security, Big Data Analytics, Cloud Computing, 3D Printing, Flexible Electronics, and more.



MAJOR PROJECT PERFORMANCE/ STATISTICS

WORK BASED LEARNING PROGRAMME (WBLP)



Enrolled Candidates	Apr 2022- Sept 2025	July 2025 - Sept 2025
Total Candidates	3237	359
SC	944	108
ST	580	67
EWS	532	56
Women	1181	128





TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE

TECH ROLLOUTS

Launch of Multi-Lingual Translation System



On the occasion of Hindi Diwas 2025 and the Fifth All India Official Language Conference (Akhil Bhartiya Rajbhasha Sammelan), held on September 14th, 2025 at Mahatma Mandir Convention and Exhibition Center, Gandhinagar, Gujarat, the Multi-Lingual Translation System Bharati – Bahubhashi Anuvada Sarthi and the Digital Dictionary Hindi Shabd-Sindhu were launched. The ceremony was graced by the Hon'ble Union Home and Cooperation Minister, Shri Amit Shah Ji, who attended as the Chief Guest. Both initiatives have been developed for the Department of Official Language (DOL), Ministry of Home Affairs (MHA), by C-DAC, Pune.

TECH ROLLOUTS

Soft Launch of IndiaAI Datalab at C-DAC Mohali



Soft launch of the IndiaAI Datalab, unveiled during the curtain raiser event of the AI Impact Summit 2026 on September 18, 2025, at New Delhi. The Hon'ble Minister of Electronics & IT, Shri Ashwini Vaishnaw, formally launched 30 IndiaAI Datalabs across the country, including the one at C-DAC Mohali, in collaboration with Intel Corporation India under the IndiaAI Mission.

TECH ROLLOUTS

Dedication of KoshaSHRI Sanskrit Encyclopaedic Dictionary Portal



The KoshaSHRI – Sanskrit Encyclopaedic Dictionary Portal (<https://koshashri-dc.ac.in>) was dedicated to the nation by the Hon'ble Minister of Education, Shri Dharmendra Pradhan, on July 29th, 2025. This significant event took place at the Akhil Bhartiya Shiksha Samagam in Bharat Mandapam, New Delhi and was graced by other esteemed dignitaries including Shri. Jayant Chaudhary, Minister of State for Education & Minister of State (IC), Ministry of Skill Development & Entrepreneurship, and Dr. Sukanta Majumdar, Minister of State for Education & Development of North Eastern Region, along with Education Ministers from 13 States/UTs.

TECH ROLLOUTS

Launch of India's first IoT Evaluation board with VEGA Processor



M/s IndieSemiC has developed India's first IoT Evaluation board that integrates BLE + LoRa connectivity with C-DAC's VEGA Processor (THEJAS32). The all-in-one ISC-VEGA-BLE-LoRA-EVK module is fully designed, developed and built in India and was launched at Semicon India 2025 in the presence of honorable Union Minister Shri. Ashwini Vaishnaw.

TECH ROLLOUTS

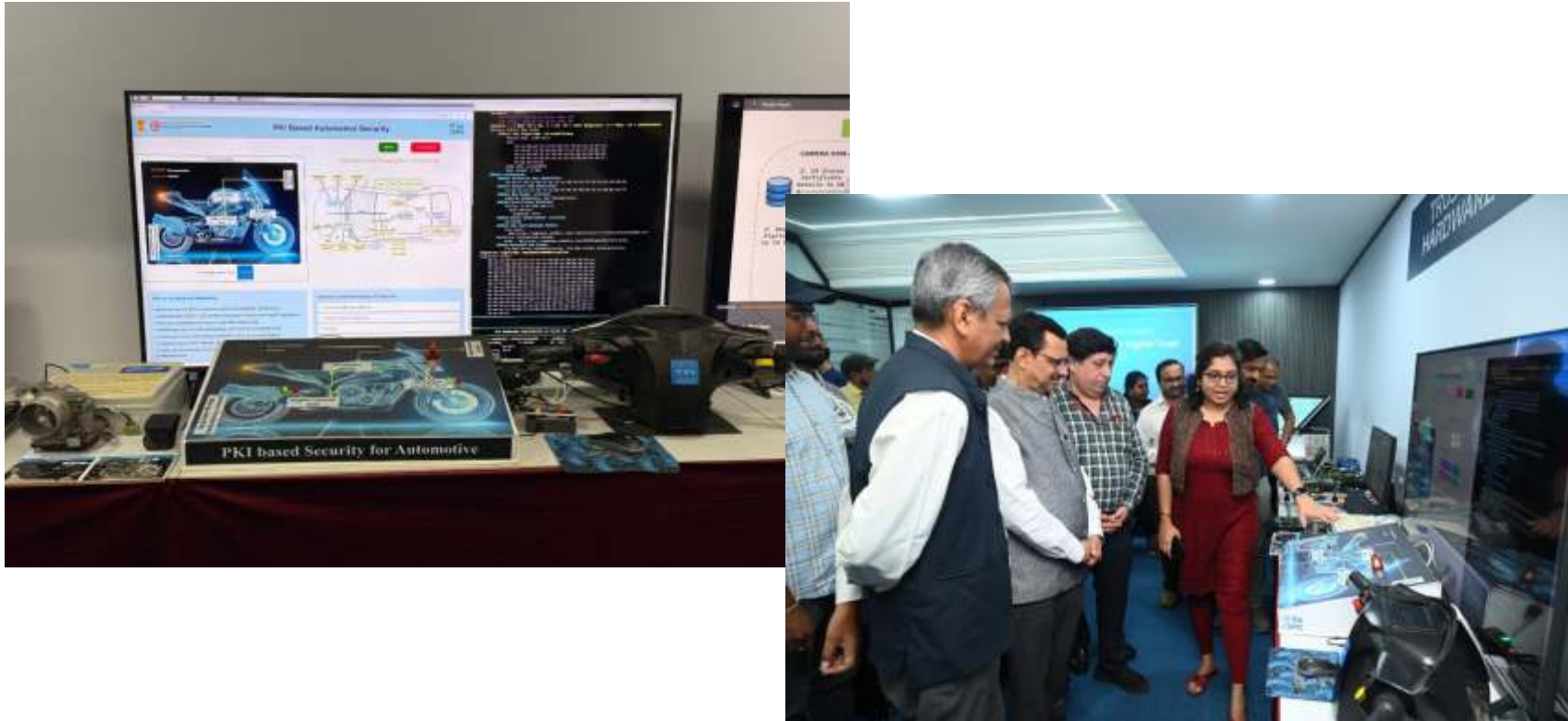
Inauguration of National Centre for Digital Trust (NCDT)



The National Centre for Digital Trust (NCDT), a pioneering initiative under the aegis of the Controller of Certifying Authorities (CCA), Ministry of Electronics and Information Technology, Government of India, was formally inaugurated on Wednesday, July 30, 2025, at C-DAC, Electronics City, Bengaluru, by Shri Arvind Kumar, Controller of Certifying Authorities, MeitY.

TECH ROLLOUTS

Inauguration of PKI for Automotive Security



A state-of-the-art demonstration for PKI-based security for automotive, developed by C-DAC Bangalore, integrated with automotive components from TVS Sensing Solutions, was installed at "The National Centre for Digital Trust" at C-DAC Bengaluru, inaugurated by Shri Arvind Kumar, Controller of Certifying Authorities, MeitY.

TECH ROLLOUTS

Launch of Foodborne Disease Surveillance Analytical Dashboard (ICMR-FoodNet)



A major stride in digital public health was marked with the launch of the Foodborne Disease Surveillance Analytical Dashboard (ICMR-FoodNet) on 10th September, 2025 at the Sikkim Manipal Institute of Medical Sciences, Tadong, Gangtok. Developed by C-DAC Kolkata under the Indian Council of Medical Research (ICMR) mission project "Surveillance of Foodborne Pathogens in North East India," the platform is set to transform how foodborne disease and outbreaks are tracked and managed across the country.

TECH ROLLOUTS

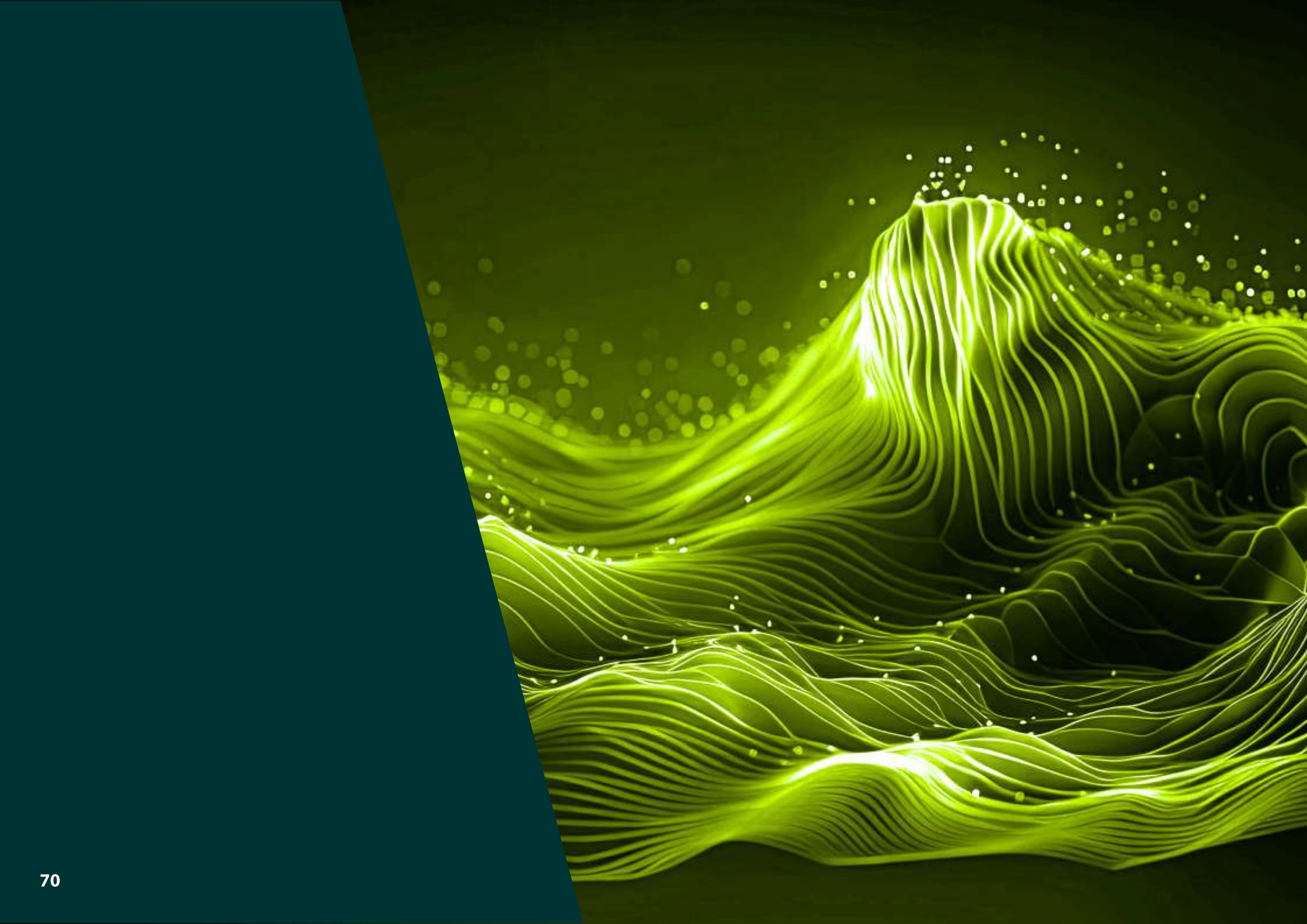
LAUNCH OF KEY INITIATIVES OF C-DAC MUMBAI



Shri E. Magesh, Director General, C-DAC launched four key initiatives of C-DAC Mumbai – Online Labs (OLabs) Hindi, SATYA-automated web accessibility testing tool, npdAI- flexible AI based system for online platforms to tackle moderating explicit content, and Centre for Indic Wisdom & Applied Technologies - Indian Knowledge Systems - marking a significant step in advancing digital India.

The image features a green-tinted background with a world map. A hand is shown reaching out from the bottom right towards a network of stylized human figures. One figure is highlighted in red, while the others are white. The figures are connected by lines, suggesting a global network or outreach. The text "INTERNATIONAL OUTREACH" is prominently displayed in the center-left.

INTERNATIONAL OUTREACH



INTERNATIONAL OUTREACH

ITEC Training on Quantum Computing



C-DAC Mohali successfully concluded a two-week intensive training programme titled "Quantum Computing - A Deep Dive (Concepts to Applications)" from July 2nd to 15th, 2025. Conducted under the auspices of the ITEC scheme and sponsored by the Ministry of External Affairs (MEA), Government of India, the programme attracted 30 international participants from 13 countries.

INTERNATIONAL OUTREACH

India-Myanmar Centre for Enhancement of IT Skills



As a part of India-Myanmar Centre for Enhancement of IT Skills (IMCEITS), C-DAC conducted a one-week (August 11th to August 15th, 2025) Faculty Development Programme (FDP) on Artificial Intelligence (AI) at IMCEITS. This was attended by 58 participants.

INTERNATIONAL OUTREACH

Certificate Course in Applied Machine Learning



C-DAC Delhi has successfully completed its Certificate Course in Applied Machine Learning (CCAML), a key initiative under the ITEC Scheme of the Ministry of External Affairs (MEA). The intensive 80-hour course, delivered over two weeks from August 18th to 29th, 2025, hosted 15 nominated participants from 14 different countries viz. Ethiopia, Ghana, Kazakhstan, Tanzania, Peru, Jamaica, Sri Lanka, Liberia, the Kingdom of Eswatini, Honduras, Uzbekistan, Kenya, Myanmar, and Uganda.

INTERNATIONAL OUTREACH

ITEC Training on Digital Health



C-DAC, Mohali, concluded a two weeks specialized training programme in Digital Health on September 2nd, 2025, under the Indian Technical and Economic Cooperation (ITEC) initiative of the Ministry of External Affairs (MEA), Government of India. The programme brought together 30 professionals from 13 countries, fostering international collaboration in digital healthcare innovation.

EVENTS







Operationalization of Next Gen ERSS 112 in Chhattisgarh (NG Cg112)



C-DAC successfully deployed the latest NG 112 solution in record time, in Chhattisgarh during September 2025.



Workshop on Building an Electronic Evidence Governance System



C-DAC Mumbai hosted a workshop on "Electronic Evidence Governance System" at its Juhu center on August 23rd, 2025. The event brought together core representatives from MeitY, C-DAC, law enforcement agencies, National Forensic Sciences University (NFSU), and IIT Jodhpur to discuss policy alignment and national platform development.



Driving Maritime Digital Transformation



Senior C-DAC officials visited the LRIT (Long-Range Identification & Tracking) National Data Centre, Mumbai to identify, prioritize, rollout potential application of emerging technologies and opportunities emerging from the Digital Centre of Excellence in Maritime, set up by C-DAC for Ministry of Ports, Shipping and Waterways (MoPSW) in Mumbai.



Cyber Security Training Programme



Under the Empowering Police Personnel and Government Officials of North East States (EPPGO) project, a series of Cyber Security Training Programmes were conducted at C-DAC CINE. A 6-hour training session was held with 48 participants, while five 20-hour training programmes were organized with a total of 132 participants.

BACKEND SQUAD



CISO DESK

1. C-DAC Patna has launched eShieldX, an internally developed ISMS portal designed to streamline process management, control compliance, and form handling. Similarly, C-DAC Delhi and Bangalore has also developed in house tools to streamline ISMS implementation.
2. Actions have been taken for the various threat incident reported during the period.
3. Following Awareness programme/ trainings/Lectures/webinars are conducted:
 - Cyber Hygiene Essentials: Protecting Yourself in the Digital World.
 - Awareness session "Cyber Ranges for Real world Readiness in Cyber Security"
 - Investment Scams in the Digital Age: Threats and Security Measures
 - Cyber Jaagrookta (Awareness) Diwas (CJD)' session on social media: Fraudulent Activities and Protective
 - Cyber Security Awareness Session for newly recruited employees of CDAC Pune
 - Online seminar on "Cyber Swachhata Diwas" as part of Swachhata Hi Sewa (SHS2025) Campaign



CIO DESK

The CIO team, in collaboration with designated NIOs across various C-DAC centres, continued to work towards optimizing Shared IT Service (SITS) delivery and implementing key digital infrastructure initiatives. The following are some of the major activities and updates undertaken during the quarter:

- **Unified Dashboard**
 - Integration of the Unified Dashboard with the e-Pramaan SSO was successfully completed.
- **BOSS OS**
 - The new Enterprise BOSS OS was officially released on August 15, 2025, with centralized registration and validation through BEMS, enabling OTP-based authentication managed by System Administrators at each centre. The OS was developed, tested, and deployed for pilot implementation at nominated centres including Bengaluru, Chennai (CINE), Silchar, and Patna.
- **EDA Management Tool**
 - System modifications for the EDA Tools Management were completed, with the reservation feature ready for implementation. Pilot deployment is currently in progress.





प्रगत संगणन विकास केंद्र

CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING

सी-डैक इनोवेशन पार्क, स. न. 34/ब/1, पंचवटी, पाषाण, पुणे - 411008, भारत

C-DAC Innovation Park, S. No. 34/B/1, Panchavati, Pashan, Pune - 411008, India

फ़ोन / Tel: +91-20-2550 3100, फ़ैक्स / Fax : +91-20- 2550 3131 www.cdac.in

● बेंगलुरु ● चेन्नई ● हैदराबाद ● कोलकाता ● मोहाली ● मुंबई ● नई दिल्ली ● नॉएडा ● नॉर्थ ईस्ट (सिलचर) ● पटना ● पुणे ● तिरुवनंतपुरम
● Bengaluru ● Chennai ● Hyderabad ● Kolkata ● Mohali ● Mumbai ● New Delhi ● Noida ● North East (Silchar) ● Patna ● Pune ● Thiruvananthapuram