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IOT

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

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Table of **Content**

Message from
Director General

It gives me immense pleasure to present Eleventh issue of Techzine R&D Digest from C-DAC which reflects our collective commitment to advancing technology, research, and innovation in service of national priorities.

This issue of Techzine is dedicated to the transformative domain of the Internet of Things (IoT). Considering the significance of this domain, IoT has been identified as Mission Mode Program of C-DAC which aims to establish a comprehensive, indigenous ecosystem for next-generation Internet of Things (IoT) solutions by leveraging C-DAC's DIR-V family of processors. This mission focuses on developing a broad spectrum of secure, efficient, and application-specific System-on-Chips (SoCs), embedded platforms, and software frameworks tailored for India's evolving digital infrastructure.

I appreciate the efforts of the Editorial Board of Techzine and contributors for curating high-quality content that not only captures technological depth but also addresses real-world challenges and opportunities. I am confident that this issue of Techzine will serve as a valuable knowledge resource and inspire further innovation and collaboration in the IoT domain.

I extend my best wishes to the team for the continued success of the Techzine in fostering a vibrant and future-ready technology ecosystem.

Magesh Ethirajan

Message from
Editorial Board

With the publication of Eleventh issue of Techzine R&D Digest from C-DAC, the Editorial Board is pleased to mark the it's continued journey, building on the strong foundation laid by its earlier issues of Techzine R&D Digest.

Over the course of these editions, Techzine R&D Digest has emerged as a valued knowledge platform, reaching a diverse readership across C-DAC, MeitY, academia, industry, research institutions, and government.

In this eleventh issue of Techzine R&D Digest, the focus is on the rapidly evolving domain of the Internet of Things (IoT), a key enabler of connected, intelligent, and data-driven systems. The articles presented in this issue focuses on "STF-IoTMal: Stacked Hybrid Textural Features in IoT Malware Detection", "IoT and Zero Trust: Rethinking Security for Connected Devices" and "Connecting the Unconnected: Satellite-Driven IoT Networks".

The Editorial Board thanks all authors, reviewers, and contributors for their sustained support and looks forward to continued engagement in advancing technology-led innovation.
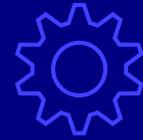
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INSPIRING INSIGHTS ON
NEW FRONTIERS

STF-IOTMAL: STACKED HYBRID TEXTURAL FEATURES IN IOT MALWARE DETECTION

A Technical Perspective and Research- based Detection Framework

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

Dr Sanjeev Kumar,
Scientist F, C-DAC Mohali

Introduction

The rapid expansion of Internet of Things (IoT) ecosystems across smart healthcare, industrial automation, transportation, critical infrastructure, and smart cities has transformed the digital threat landscape. Their distributed nature, limited computational architecture, and lack of standardized security controls make IoT deployments vulnerable to malware attacks.

IoT devices are highly vulnerable because security was not the primary requirement during their initial design. Moreover, the nature of heterogeneous connected devices, distributed architecture, and limited computing at the sensor make malware detection a complex problem. This reaserch driven framework proposes a novel malware detection architecture, called STF-IoTMal, which utilizes Stacked Hybrid Textural Features and Machine Learning for Internet of Things (IoT) malware detection. The raw executable files collected in the software-defined network (SDN) environment are processed and labeled through the data preprocessing and labeling engine. After that, malicious programs are transformed into grayscale image formats, which are used to extract textural features. Hybrid textural features, including both local and global features, are extracted and then horizontally stacked to build a single feature map. This study utilizes local binary patterns (LBP), a Grey Level Co-occurrence Matrix (GLCM), and a Dense-Scale Invariant Feature Transform (DSIFT) for local feature extraction.

Data Acquisition Platform

A Software-Defined Networking (SDN) enabled honeynet framework is designed to collect real-world IoT malware samples. The system integrates:

- Low and high interaction honeypots
- Intrusion detection sensors
- SDN controller with programmable flow rules
- Honeyfarm cluster
- Attack logging repository

Malware binaries are extracted from traffic payloads and labeled using AVclass, supported by unsupervised clustering to confirm family grouping where VirusTotal signatures are unavailable for emerging variants.
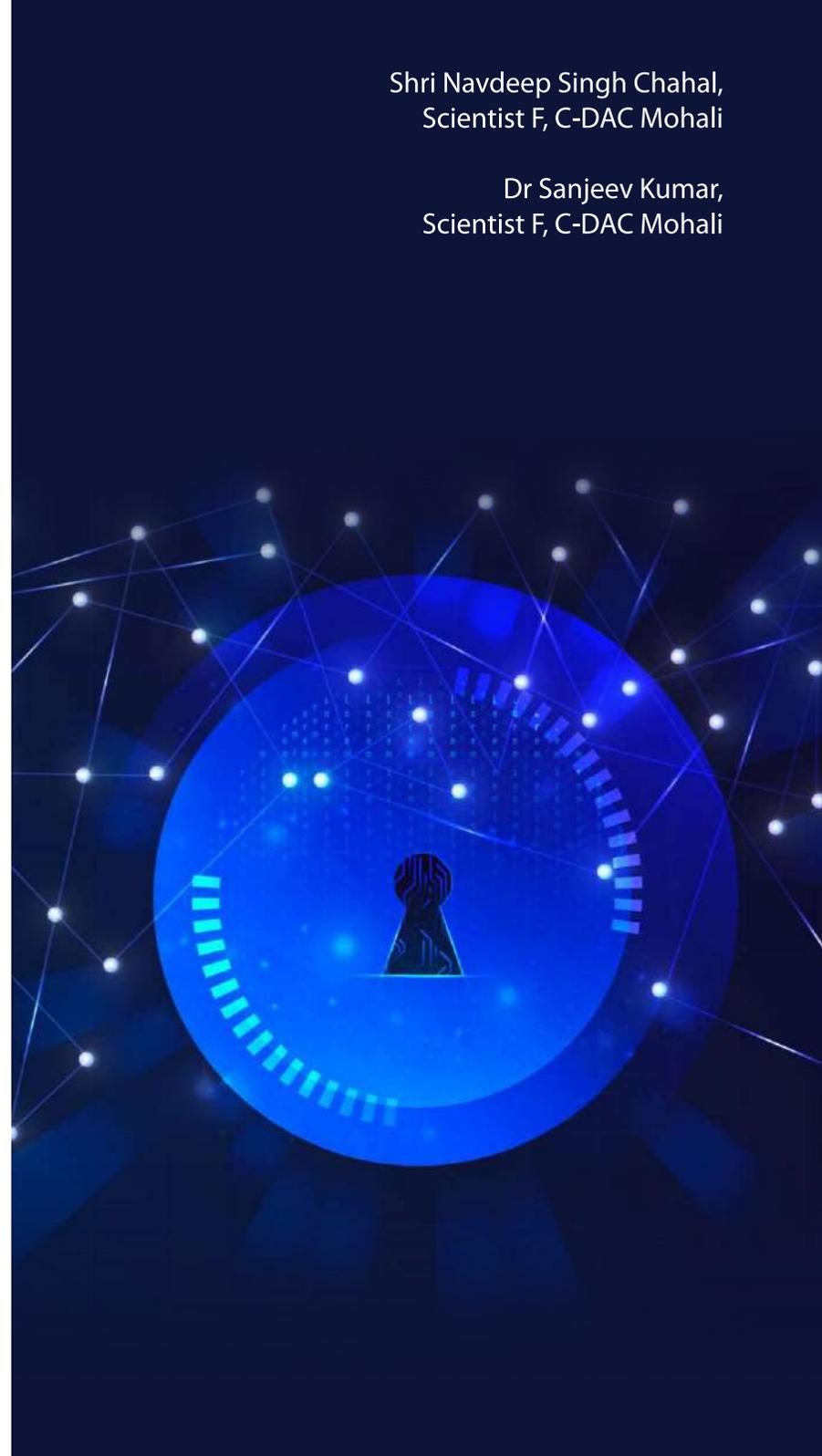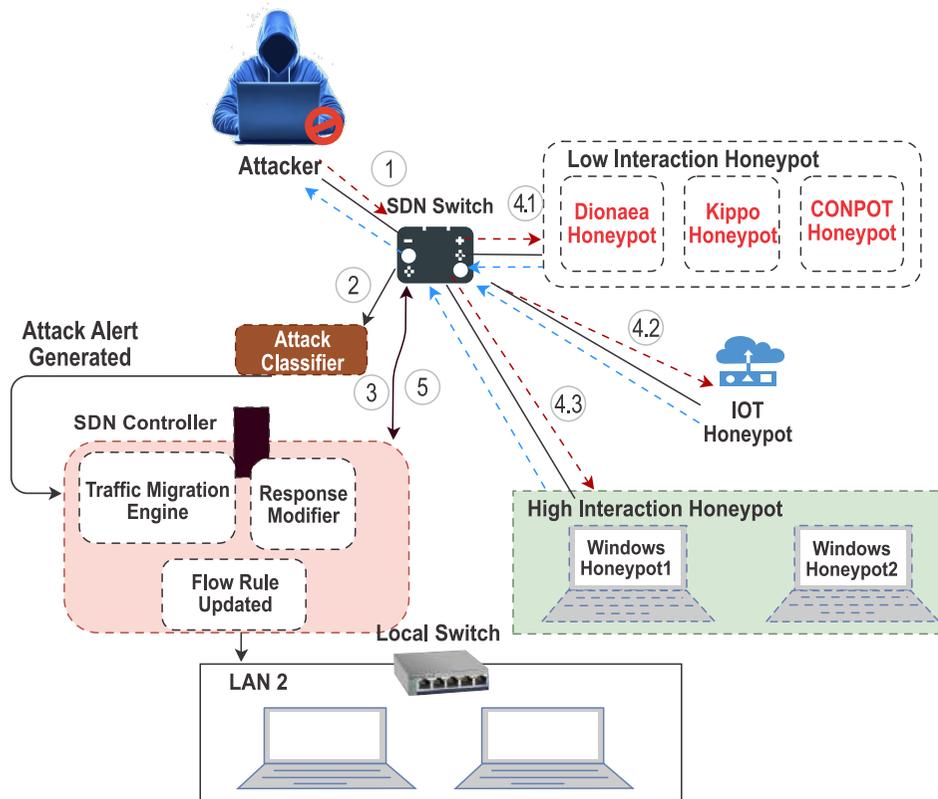
Attack migration module in an SDN-enabled proactive security monitoring architecture

Technical Origins in IoT Malware Detection Systems

IoT devices exhibit diverse architectures, continuous connectivity, and limited computational capacity. These constraints limit traditional signature-based detection methods and necessitate static analysis using raw binary artifacts.

IoT malware binary to image conversion

The high-level source of IoT malware is converted into binary numbers, which are further divided into 8-bit binary strings. These 8-bit binary strings are converted into decimal numbers, where each decimal number is represented as a pixel in the image range of [0, 255]. This matrix of decimal numbers is further transformed into grayscale image formats. However, existing literature converts the malware binary program into a grayscale image with a fixed image size, which can cause data loss. To avoid data loss, we added extra bits as padding.

Grayscale images of Mirai and Gafgyt IoT Malware samples
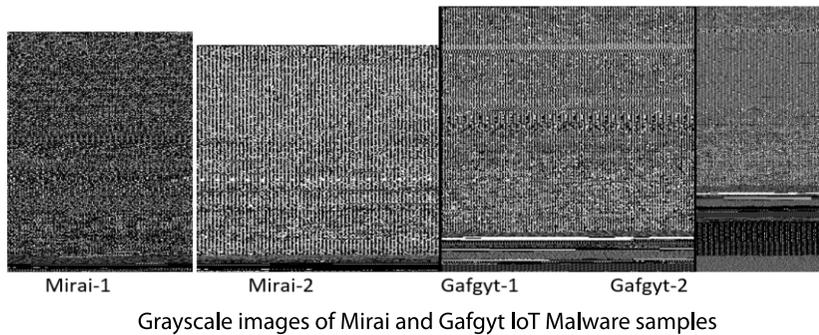
The analysis and detection module of the proposed detector comprises feature extraction, selection, and classification of malware threats into their respective families. The visualized grayscale images of IoT malware files for heterogeneous platforms and architectures (MIPS, ARM, Linux, etc.) are fed to the feature extractor module. As mentioned, this study utilizes seven different types of textural feature extraction, including LBP, DSIFT, GLCM, Haralick, GIST, and HoG features, to cover the diverse features extracted from local and global image descriptors.

Advanced Feature Extraction: Image Descriptors, Stacked Features, and ML
Using stacked features, the performance of both classifiers improved significantly, with a maximum test classification accuracy of 99.60 %. Time complexity is also a crucial parameter for evaluating the performance of learning algorithms. This study measures the prediction time of a classifier for multi-class family prediction using test instances of the dataset. In the case of the kNN classifier, only 0.07 seconds was taken as a prediction of unknown instances with a test accuracy of 98.38\%, whereas, in the case of the RF classifier, only 18.9 milliseconds was the time taken by the best classifier with a test accuracy of 99.6 %, which is a remarkable performance in dealing with unknown IoT malware threats.

- Local Descriptors:
  - LBP (Local Binary Patterns)
  - GLCM (Grey Level Co-Occurrence Matrix)
  - DSIFT (Dense Scale Invariant Feature Transform)
- Global Descriptors:
  - GIST
  - Haralick Features
- Stacked features are evaluated using classic ML classifiers:
  - Support Vector Machines
  - k-Nearest Neighbor
  - Random Forest

State-of-the-Art Comparative Experimental Evaluation Malware Detection Methods
The methodology is compared with existing literature that has employed similar methods in its research. However, a comparison was performed with those who used similar image descriptors in their research works. It presents a comparative analysis, including accuracy, algorithm used, platforms, detection time, and dataset used in their research works. The study demonstrates that the proposed methods outperform previous methods, achieving 99.60% test classification accuracy with a prediction time of only 0.02 seconds.

Table1.Comparative results of existing malware detection methods and the proposed framework using stacked features.

Ref.	Acc. (%)	Algorithm	Features	Detection Time	Platform	Dataset
Carlin et al. (2017)	98.60	CNN	CNN	59.6 min	IoT	Malware dataset
Li et al. (2015)	92.10	DBN	DAE	1.243 s	--	KDDCUP99
Vasan et al. (2020)	98.82	CNN	CNN	0.81 s	Microsoft	Malimg
Vasan et al. (2020)	97.35	CNN	CNN	0.81 s	IoT	IoT-Android
Nataraj et al. (2011)	98.00	kNN	GIST	1.4 s	Microsoft	MalImg
Narayanan et al. (2016)	96.60	kNN	Image	--	Microsoft	Microsoft BIG
Wu et al. (2017)	89.55	kNN	LBP	--	IoT/Android	Drebin
Naeem et al. (2019)	95.11	SVM	CLGM	--	Microsoft	MalImg
Naeem et al. (2019)	92.62	SVM	CLGM	--	IoT	IoT
Naeem et al. (2019)	98.17	DCNN	GLCM	2.66 s	Microsoft	MalImg
Naeem et al. (2019)	97.35	DCNN	GLCM	4.08 s	IoT	IoT
Naeem et al. (2019)	98.40	kNN	LGMP	--	Microsoft	BIG Dataset
Naeem et al. (2019)	94.08	SVM	LGMP	--	IoT	Android
Naeem et al. (2019)	93.85	kNN	LGMP	--	IoT	Android
Liu et al. (2022)	90.30	SVM	MLP	1230 ms	Microsoft	KDD CUP99
Ikram et al. (2019)	97.00	kNN	GIST	--	Microsoft	MalImg
Unver et al. (2020)	98.75	AdaBoost	Global	0.018 s	IoT/Android	Custom
Proposed (Ours)	98.38	kNN	Stacked	0.07 s	IoT	Custom
Proposed methodology	99.60	RF	Stacked	0.02 s	IoT	Custom

Future Research Directions

- Integration of dynamic behavioral features - Future work can combine static textural features with dynamic execution traces such as API call sequences, network flows, and system interactions. This hybrid approach may improve detection of malware that hides its behavior through obfuscation or delayed execution techniques.
- Evaluation against polymorphic and metamorphic malware strains - Further experiments should test robustness against malware variants that modify their code structure to evade pattern recognition. Studying polymorphic and metamorphic samples will help determine whether textural features capture intrinsic malicious traits or are sensitive to superficial changes.
- Study of adversarial attacks on textural features - Adversarial manipulations can alter textural patterns to mislead classifiers while retaining malicious behavior. Investigating attack strategies and defense mechanisms will help improve resilience and trustworthiness of image-based malware detection models.

Conclusion

Malware detection is a challenging problem, especially in the Internet of Things (IoT) environment. This paper proposes a novel SDN-enabled Internet of Things malware detection method called STF-IoTMal: Features and Machine Learning for Internet of things malware Detection. The raw executable files collected in the SDN environment are processed and labeled through the data labeling engine. This paper transforms the collected IoT binary executable of different formats into grayscale images. Textural feature extraction is performed using hybrid image descriptors that include local and global features. STF-IoTMal presents a scalable malware detection architecture leveraging stacked hybrid textural features to classify IoT malware independent of device architecture. The system achieves high accuracy and low detection latency, proving its suitability for real-time security operations across large-scale IoT deployments.

IOT AND ZERO TRUST: RETHINKING SECURITY FOR CONNECTED DEVICES

Ms Poonguzhali. P,
Scientist-F, C-DAC Chennai

Introduction

The Internet of Things (IoT) represents a large-scale network of interconnected devices that continuously sense, process, and exchange data, fundamentally reshaping modern digital ecosystems. IoT systems are increasingly evolving into an intelligent and integrated cyber–physical layer, supported by artificial intelligence (AI) deployed both at the network edge and within centralized cloud infrastructures. This convergence enables real-time analytics, autonomous decision-making, and system-wide automation.

According to IoT Analytics, the number of connected IoT devices to grow by 14% in 2025 and to reach 39 billion in 2030; >50 billion by 2035. While this expansion drives innovation and operational efficiency across a wide range of application domains, it also expands the attack surface, making systems more vulnerable to threats such as data breaches, unauthorized access, malware, and large-scale distributed denial-of-service (DDoS) attacks, necessiating the need for stronger security and privacy mechanisms.

IoT Security Challenges and Threat Landscape

The proliferation of IoT devices significantly expands the overall threat landscape. These devices are often deployed in uncontrolled or physically inaccessible environments, operates continuously, and rely heavily on network connectivity, making them attractive targets for adversaries.

IoT systems are vulnerable to a wide range of attacks, including but not limited to:

- **Weak or default authentication credentials:** Enables unauthorized access
- **Insecure communication protocols:** Leads to eavesdropping and man-in-the-middle attacks
- **Malware infections and botnets:** Compromised devices leveraged for large-scale DDoS attacks
- **Firmware vulnerabilities:** Caused by outdated, unsigned, or unverified updates/ patches
- **Physical attacks:** Device tampering or hardware probing
- **Insecure APIs and cloud interfaces:** Exposes sensitive data and control functions
- **Side-channel attacks:** Exploiting power consumption, timing, or electromagnetic leakage

Limitations of Traditional Security Approaches

Traditional security mechanisms such as perimeter-based defenses, is not suitable for IoT environments, due to the constraints as listed below:

- **Resource limitations:** Limited processing power, memory, and energy capacity.
- **Device heterogeneity:** IoT ecosystems consist of diverse hardware platforms, operating systems, and communication protocols.
- **Massive scale:** Large-scale deployments involve thousands to millions of devices.
- **Dynamic network topologies:** Devices frequently join, leave, or move across networks.
- **Limited Scalability:** As networks expand, managing and maintaining perimeter defenses becomes increasingly complex and inefficient.

To address the challenges faced in IoT architectures and to enhance defense-in-depth strategies, Zero Trust (ZT) offers a robust and comprehensive solution for the IoT ecosystem.

Zero Trust Architecture for IoT Security

Zero Trust Architecture (ZTA) is based on the principle of "never trust, always verify." In contrast to perimeter-based security models, Zero Trust assumes that no device, user, or network segment is inherently trustworthy. This model assumes that no entity, either internal or external to the network, can be trusted by default. Instead, it examines authentication, authorization of every request and continuous monitoring of all devices, users, accounts, and traffic flows within the IoT environments.

(a) Core Zero Trust Components in IoT

- **Continuous device and user authentication:** Every device and user is continuously verified before and during access to prevent unauthorized interactions.
- **Micro-segmentation:** Network resources are divided into isolated segments to limit lateral movement in case of compromise.
- **Role-based access control and least-privilege policies:** Access permissions are restricted to only what is necessary for each device or role.
- **Continuous monitoring and anomaly detection:** System behavior is continuously observed to detect and respond to suspicious activities in real time.

(b) Advantages of Zero Trust in IoT Environments
- Zero Trust for IoT devices ensures that each device is authenticated before being granted access to sensitive information or systems. by eliminating implicit trust relationships and enforcing least-privilege access control. Even if a device is compromised, micro-segmentation and strict policy enforcement limit the attacker's ability to propagate across the system
- This tightens security, reducing the chances of exploitation, especially when devices are deployed in diverse and sometimes unprotected environments.

(c) Role of AI and Automation in Zero Trust IoT Systems
- AI and machine learning play a critical role in operationalizing Zero Trust at scale.
- Automated policy adaptation, behavioral anomaly detection, and real-time risk assessment enable security frameworks to respond dynamically to evolving threats. These capabilities are particularly significant in large IoT deployments, where manual security management is infeasible.

Challenges in Implementing Zero Trust for IoT Devices
While Zero Trust provides a comprehensive security solution, there are challenges to its adoption in IoT networks:

- **Legacy IoT devices:** Many IoT devices were not designed with security in mind, making it difficult to integrate them into a Zero Trust architecture.
- **Complexity of large IoT ecosystems:** Managing and monitoring large numbers of devices can be resource intensive.
- **Interoperability:** Achieving consistent Zero Trust enforcement across diverse IoT hardware, software platforms, and communication protocols remains a significant integration challenge.

Conclusion
The rapid expansion of IoT systems introduces complex security challenges that cannot be adequately addressed using traditional security models. Zero Trust Architecture offers a promising and research-driven approach by enforcing continuous verification, fine-grained access control, and adaptive security policies. When combined with lightweight cryptography and AI-driven monitoring, Zero Trust provides a resilient and scalable security framework tailored to the unique demands of IoT environments. Continued research and innovation in this area will be essential to achieving secure, reliable, and trustworthy IoT deployments in the future.

CONNECTING THE UNCONNECTED: SATELLITE-DRIVEN IOT NETWORKS

Dr Sunnam Venkata Srikanth,
Scientist-F, C-DAC Hyderabad

Introduction: The Connectivity Gap in Remote IoT

The Internet of Things (IoT) has transformed the way physical environments are monitored by enabling autonomous, sensor-based data collection at unprecedented scales. From tracking environmental conditions and agricultural parameters to supporting disaster response and infrastructure monitoring, IoT systems reduce human intervention while improving data accuracy and availability.

Despite these advances, connectivity remains a fundamental limitation. Conventional communication technologies such as Wi-Fi and cellular networks rely heavily on terrestrial infrastructure, continuous power availability, and dense network coverage. As a result, they are poorly suited for geographically isolated environments such as forests, oceans, deserts, mountainous regions, and disaster-prone zones. Ironically, these remote regions are often where continuous monitoring is most critical.

To bridge this connectivity gap, IoT systems require communication solutions that are energy-efficient, long-range, and independent of ground-based infrastructure. Low Power Wide Area Network (LPWAN) technologies have emerged as a promising solution, enabling low-data-rate communication over large distances while operating on limited power budgets. Among LPWAN technologies, Long Range (LoRa) communication has gained widespread adoption due to its robustness, flexibility, and low operational cost.

However, even LoRa-based networks depend on terrestrial gateways, which may not be available in remote locations. Satellite communication offers a natural extension, providing wide-area and global coverage without reliance on ground infrastructure. In particular, low-altitude satellite platforms such as CubeSats offer reduced link distances, and cost-effective deployment, making them well suited for integration with LPWAN-based IoT systems.

Satellite-Assisted LoRa IoT Architecture

The proposed system combines IoT sensing devices, LoRa LPWAN communication, satellite relay links, and terrestrial ground stations to create an end-to-end data pipeline from remote environments to cloud-based applications.

Each IoT node consists of environmental sensors, a low-power microcontroller, a LoRa transceiver, and a power management subsystem optimized for battery operation. Sensor data are periodically collected, processed locally, and packaged into compact payloads suitable for low-data-rate transmission.

When a satellite passes within the line of sight of an IoT node, the sensed data are transmitted using the LoRa protocol. The use of LoRa ensures energy-efficient communication while maintaining long-range connectivity. The satellite acts as a relay, receiving LoRa-modulated signals and forwarding them to a ground station. This approach eliminates the need for local gateways or cellular connectivity in remote regions.

At the ground station, received packets are decoded using compatible radio parameters such as operating frequency, bandwidth, and Spreading Factor (SF). The decoded data are then forwarded to cloud servers via the Internet, where they are stored, visualized, and analysed. End users can access real-time and historical sensor data through a centralized dashboard, enabling informed decision-making without physical access to deployed IoT devices.

Low-altitude satellite platforms, particularly CubeSat-class satellites, offer several advantages for this architecture. Shorter communication distances improve link reliability, while lower development and launch costs make the system economically viable for large-scale IoT deployments.

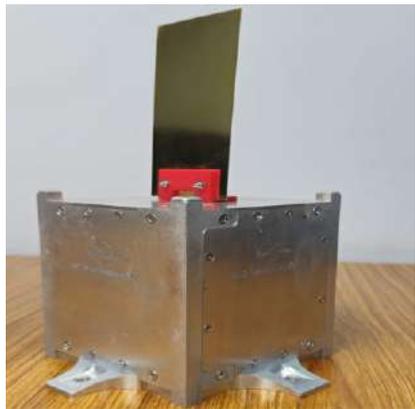
Satellite Connected IoT Architecture

Near-Space Experimental Validation

To experimentally validate the proposed satellite-assisted IoT architecture, a High-Altitude Balloon (HAB) experiment was conducted as a near-space test platform. HAB provide operating conditions like Low Earth Orbit (LEO) satellites, including extended line-of-sight coverage and dynamic propagation environments, while allowing controlled testing and recovery of hardware.

The HAB payload consisted of an environmental sensor module, a LoRa transceiver, a tracking system for real-time altitude and position monitoring, and a power management unit. The payload was enclosed in a lightweight structure and launched using a helium-filled balloon, allowing it to ascend to high altitudes. During the flight, ground-based IoT nodes transmitted sensor data to the HAB payload using LoRa communication. The payload functioned as a satellite, receiving the transmitted data and relaying them to a ground station configured with matching LoRa parameters. Data were continuously logged and visualized through a dashboard during both ascent and descent phases.

Key performance metrics, including Received Signal Strength Indicator (RSSI), Signal to Noise Ratio (SNR), Packet Reception Rate (PRR) and communication stability, were evaluated as functions of altitude and distance. The results demonstrated consistent packet reception and stable communication links under dynamic near-space conditions. Variations in RSSI and SNR provided valuable insights into propagation behaviour and link performance at high altitudes. The successful reception of data throughout the flight confirms the robustness of LoRa communication and its suitability for satellite-assisted IoT applications. The HAB experiment also offers practical insights into antenna performance, parameter selection, and system reliability in near-space environments.

Experimental CubeSat

HAB Tracking Antennas

HAB Launch

Applications and Future Outlook

Satellite-connected IoT systems unlock new possibilities for continuous monitoring in regions previously beyond the reach of conventional networks. Potential applications include environmental and climate monitoring, maritime and oceanographic sensing, wildlife tracking, precision agriculture, disaster detection, and infrastructure monitoring in remote areas.

The convergence of LPWAN technologies with low-cost satellite platforms represents a scalable and economically viable approach to global IoT connectivity. As satellite constellations expand and energy-efficient communication protocols continue to evolve, satellite-assisted IoT systems are expected to play a critical role in enabling resilient, worldwide sensing networks.

Future work will focus on optimizing communication parameters, improving link reliability, and exploring bidirectional communication for remote device management. The integration of CubeSat constellations with LPWAN-based IoT systems has the potential to transform remote sensing and monitoring, bringing truly global connectivity to the Internet of Things.

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(P3DX)

CI: Dr. Balaji R, Scientist F, C-DAC Bengaluru

Co-CI: Ms. Surabhi Dwivedi, Scientist E, C-DAC Bengaluru

Collaborators: India Institute of Science (IISc), Indian Institute of Technology (IIT) Bombay & International Institute of Information Technology (IIIT) Bengaluru

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. This project will introduce a new platform (Privacy Preserving Processing and Data Exchange (P3DX)) which will form the backbone of all sensitive and personal data sharing. It will provide a complete software solution, together with new exploratory areas and delivering several use cases.

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: Next Generation Internet Names, Services and Standards (NGINSS)

CI: Dr. Balaji R, Scientist F, C-DAC Bengaluru

Co-CI: Mr. Gopinath P, Scientist E, C-DAC Bengaluru

Brief Description: The project aims to be a Trusted Notifier for Malicious Domains which is a critical step in proactively identifying, reporting, and preventing the propagation of cyber threats across the internet ecosystem. By continuously monitoring domain name activities to detect phishing sites, malware distribution points, botnet command-and-control servers, and other malicious infrastructures, validated intelligence is promptly shared with relevant stakeholders to enable proactive mitigation. Complementing this effort is the strategic setting up and configuration of Secure DNS Resolvers across varied locations, ensuring that users benefit from faster, more reliable, and more secure name resolution services. These secure resolvers incorporate advanced threat intelligence feeds, DNSSEC validation, filtering of known malicious domains, and privacy-preserving mechanisms, thereby reducing exposure to cyber risks at the DNS layer itself.

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: OT CYBER GUARD

CI: Shri Lagineni Mahendra, Scientist E, C-DAC Bengaluru

Co-CI: Shri Raja M Vasudevan, Scientist E, C-DAC Bengaluru
Shri R K Senthil Kumar, Scientist G, C-DAC Bengaluru

Brief Description: The primary objective of the project is to research and develop an OT Cyber Guard for Oil & Gas and Power sectors, with the following key components to enhance the security and resilience of Critical Infrastructures against a range of threats and cyberattacks:

- OT Cyber Protection & Incident Response Tool
- AI-driven Critical Infrastructure Cyber Resilience
- OT Cyber Security Audit Compliance Testing Tool

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: Automated system for Cybersecurity Policies, Assessments, Audits, Ranking and IR

CI: Shri R K Senthil Kumar, Scientist G, C-DAC Bengaluru

Co-CI: Shri Lagineni Mahendra, Scientist E, C-DAC Bengaluru

Collaborators: IIT Kanpur, NIT Jalandhar and IIT Mandi

Brief Description: The primary objective of this project is to design, develop four innovative, automation-driven cyber security platforms - Ccure policy Pro, Ccure Audit, CCure Rank and Ccure IR – To address critical challenges in cybersecurity automation, governance, maturity assessment, policy management, and cyber security audit for government institutions.

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: AI augmentation and implementation of e-Saadhya platform for PAN India technology empowerment of Children with Autism and Mild Intellectual disabilities (e-Saadhya 2.0)

CI: Dr. R. C. Saritha, Scientist F, C-DAC Bengaluru

Co-CI: Dr. C. H. Janaki, Scientist F, C-DAC Bengaluru

Collaborating Agency(s): NIEPID, Secunderabad

Brief Description: The project titled "e-Saadhya 2.0" aims to leverage the power of artificial intelligence to promote inclusion, accessibility, and positive outcomes for children with Autism and Mild Intellectual Disability, empowering them to reach developmental goals to their full potential, adapt and adjust to regular schools. It incorporates national standardized screening, diagnostic, assessment, and intervention tools. Enhancing the Adaptable and Accessible Tools for Autism with Mild ID with AI advanced technology and piloting the upgraded version in Special and Inclusive Schools across PAN INDIA.

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: Multilevel Capacity Building and Skilling in Industry aligned Emerging Technologies

CI: Shri Asit Kumar Singh, Project Manager, C-DAC Kolkata

Co-CI: Shri Niladri Sekhar Saha, Scientist E, C-DAC Kolkata

Collaborating Agency(s): Banasthali Vidyapith, Rajasthan, Indira Gandhi Delhi Technical University for Women, (IGDTUW), Delhi, CSIR - Central Electronics Engineering Research Institute (CEERI), Pilani, Rajasthan, Indraprastha Institute of Information Technology Delhi (IIIT-Delhi), Central Institute of Technology (CIT) Kokrajhar, BTR, Assam, Amrita Vishwa Vidyapeetham, Kerala, University of Delhi (DU), Delhi

Brief Description: The program targets emerging technologies including AI, Data Science, Quantum Computing, Cloud Computing, Semiconductor Technologies, VLSI Design, Cybersecurity, 5G/6G, Robotics, Automation, Manufacturing Engineering, and Drone Technology to address critical skill gaps in the Electronics and IT sectors. Aligned with the National Skill Qualification Framework (NSQF), it emphasizes hands-on, job-oriented training through NSQF-approved Qualification Packs across multiple proficiency levels. Anchored in national priorities such as NITI Aayog's Strategy for New India@75 and the Government of India's SEMICON initiative, the program fosters strong academia–industry collaboration, enhances employability and entrepreneurship, and prepares a globally competitive workforce through continuous formative evaluation aligned with NEP 2020.

NEW MEITY PROJECTS

IDEAS TO ACTION

Name of Project: Audit and Assessment of web and mobile applications in compliance to The Digital Personal Data Protection (DPDP) Act, 2023

CI: Dr. Ch A S Murty, Scientist G and Centre Head, C-DAC, Kolkata

Co-CI: Shri Ritesh Mukherjee, Scientist F, C-DAC, Kolkata
Ms. Indraveni Ch, Scientist F, C-DAC, Hyderabad

Brief Description: The objective of the project is to develop a comprehensive tool or framework aligned with the Digital Personal Data Protection (DPDP) Act, integrating advanced technologies to ensure compliance, security, and robust data governance.

NEW PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)

Name of Project: INtelligent Drone based flying RSU for reliable C-V2X communicAtion (INDRA)

CI: Dr. Sunnam Venkata Srikanth, Scientist-F, C-DAC Hyderabad

Funding Agency: NMICPS Technology Innovation Hub on Autonomous Navigation Foundation (TIHAN), IITH

Brief Description: This project aims to design, develop, and experimentally validate a Flying Roadside Unit (RSU) system by integrating C-DAC's existing C-V2X RSU hardware with commercial/TiHAN UAV (drone) platforms, enabling rapid and flexible deployment of V2X communication infrastructure. The flying RSU will be configured to support both IEEE and ETSI protocol stacks to ensure interoperability across diverse vehicular communication standards. Through controlled field experiments, the system's communication performance such as coverage extension, latency, reliability, and message delivery will be evaluated under realistic flying RSU scenarios. The project will further demonstrate practical, real-world use cases where drone-mounted RSUs can enhance responsiveness and connectivity in dynamic environments such as traffic congestion, accident zones, rural coverage gaps, and emergency situations.

NEW PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)

Name of Project: SAFAL 2025-26 Field Test and Key Stage Assessment (KSA) in Digital Mode

CI: Shri Balaji Sorakapet, Scientist D, C-DAC Mumbai

Co-CI: Ms. Archana Rane, Scientist F, C-DAC Mumbai
Shri Chandra Shekhar, Scientist E, C-DAC Mumbai

Funding Agency: Central Board of Secondary Examination (CBSE), Ministry of Education

Brief Description: In a significant move to operationalize one of the key visions of the National Education Policy (NEP) 2020, which prioritizes competency-based learning over rote memorization and tracking progress of learning outcomes students at Grade 3, 5, 8, CBSE has partnered with C-DAC to implement and deploy a robust and cost-effective digital platform for SAFAL (Structured Assessment for Analyzing Learning) Key Stage Assessment 2025-26 cycle across over 21,500 registered schools. The digital platform features item management, exam delivery, and a live monitoring dashboard. This platform employs a hybrid architecture decoupling management from execution; it leverages the cloud for centralized data administration while utilizing schools' local digital infrastructure (computer labs) for conducting assessments, ensuring high availability and a smooth user experience. This partnership also covers critical operations such as cloud infrastructure management, master trainer capacity building, and remote technical support during the assessments.

NEW PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)

Name of Project: Design and development of a prototype wire wear monitoring system using components available at CGCRI

CI: Shri Devdulal Ghosh, Scientist E, C-DAC, Kolkata

Co-CI: Shri Tamal Dey, Project Engineer, C-DAC, Kolkata
Shri Sabyasachi Majumdar, Project Engineer, C-DAC, Kolkata

Funding Agency: CSIR–Central Glass & Ceramic Research Institute (CSIR–CGCRI)

Brief Description: The proposed work focuses on the design and development of a prototype wire wear monitoring system using advanced image acquisition and image processing techniques, in close technical alignment with CSIR-CGCRI specifications and guidance. The approach emphasizes systematic requirement analysis, modular system architecture, and real-time visual monitoring through a user-friendly GUI. The solution integrates GigE-based industrial imaging, laser-assisted illumination, and quantitative wear analysis algorithms to detect surface degradation, geometric changes, and wear progression in wires. A modular software framework enables real-time image acquisition, processing, visualization, and data logging, while ensuring scalability for future enhancements.

NEW PROJECTS

IDEAS TO ACTION

(EXTERNAL FUNDING)

Name of Project: Smart Examination Analytics Platform

CI: Dr. Ethirajan D, Scientist F & Centre Head, C-DAC, Chennai

Co-CI: Shri V Solai Murugan, Scientist E, C-DAC, Chennai

Funding Agency: Staff Selection Commission (SSC)

Brief Description: The Examination Score Processing & Analytics System is an advanced platform that transforms post-exam data into actionable insights. Designed for large-scale competitive examinations, it delivers deep analytics across exams, centers, slots, and regions, enabling transparent evaluation, anomaly detection, and informed decision-making—while ensuring accurate and fair result processing in the background.

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 December 2025)				Quarterly IPR portfolio of C-DAC (October 2025- December 2025)			
	Patents	Copyrights	Trademarks	Design	Patents	Copyrights	Trademarks	Design
Applied/Filed (Pending)	67	26	47	6	7	6	9	2
Granted/Registered	122	196	24	8	4	2	0	2
Total	189	222	71	14	11	8	9	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.
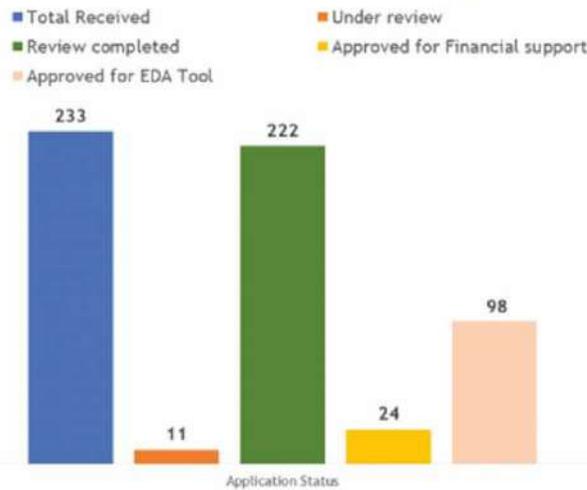
PROGRESS PULSE:
A PERFORMANCE DASHBOARD
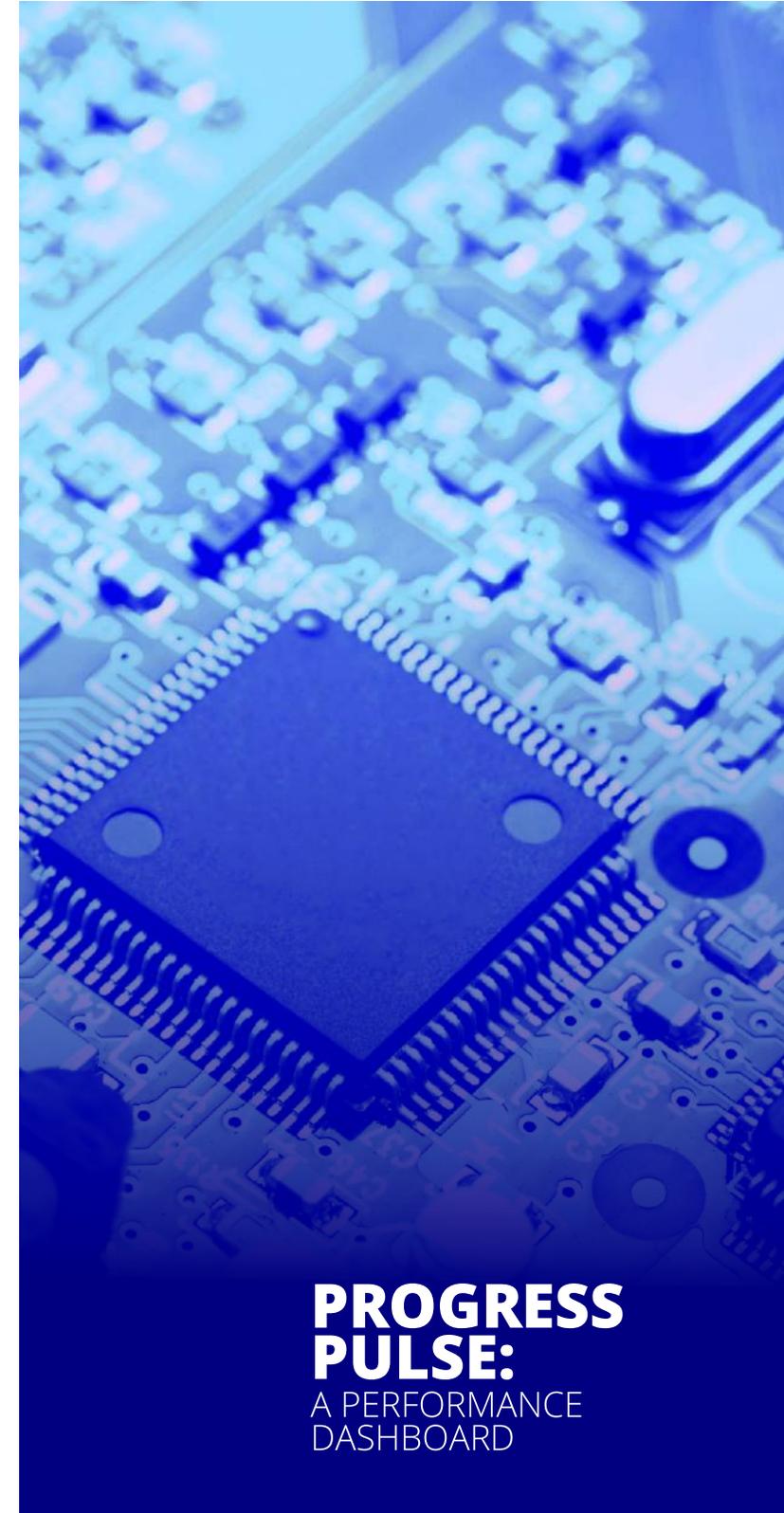
MAJOR PROJECT PERFORMANCE/ STATISTICS

## 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.

Design Linked Incentive (DLI) Status

(Application Status)

Legend:
- Total Received
- Review completed
- Approved for EDA Tool
- Under review
- Approved for Financial support

Bar chart values: 233, 11, 222, 24, 98

	Financial support	EDA Tool support
Applications received	115	118
Applications approved	24	98
Applications rejected	91	09
Applications under appraisal	00	11
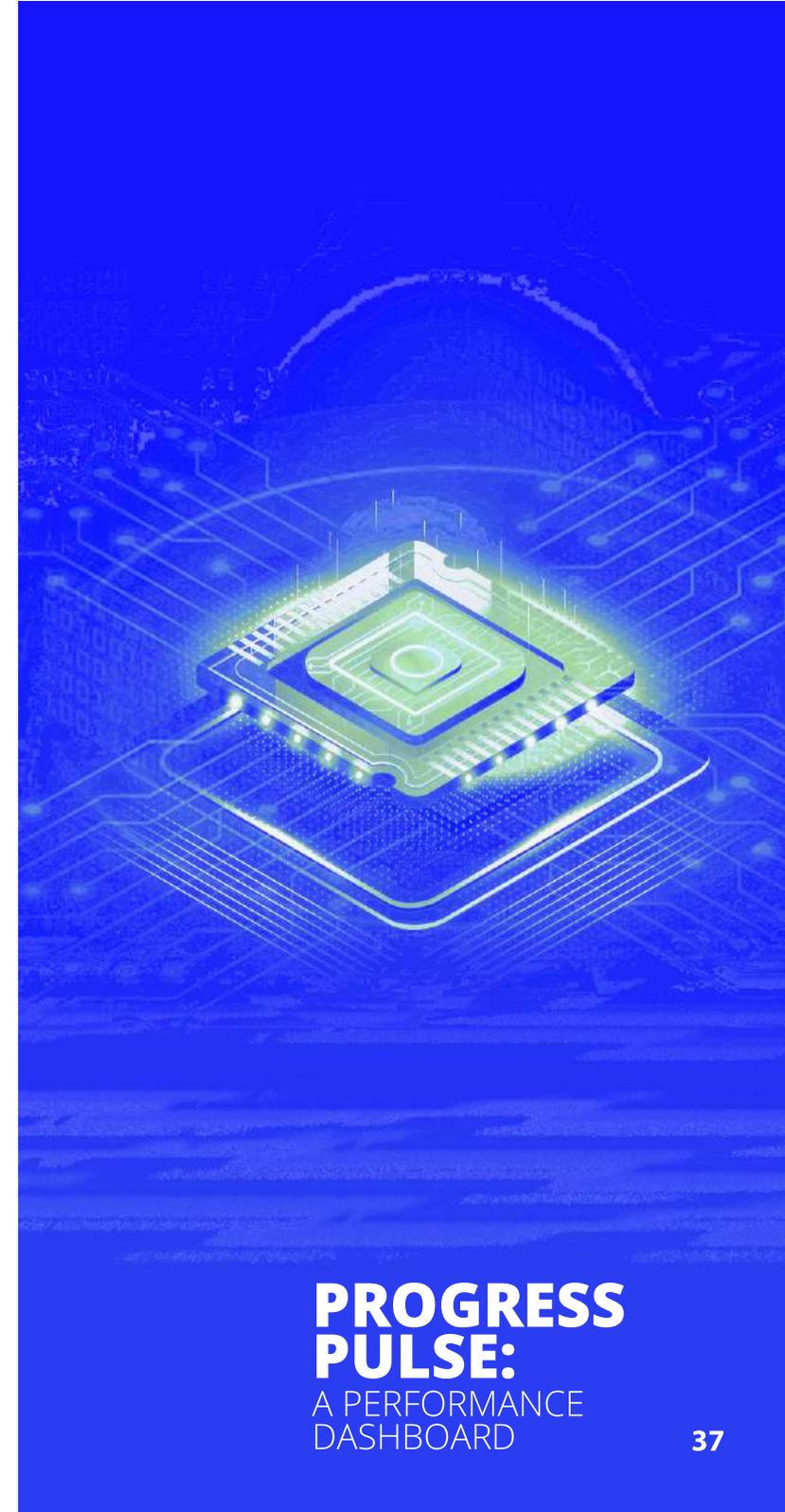
MAJOR PROJECT PERFORMANCE/ STATISTICS

OUTCOMES ENVISAGED

Company Name	IPs Generated	Designs Taped Out	ASICs Fabricated	No. of Patents Filed	Manpower Generated
Netrasemi Pvt. Ltd.	18	1	1	2	56
Fermionic Design Pvt. Ltd.	13	1	1	0	24
Vervesemi Microelectronics Pvt. Ltd.	15	1	1	0	30
DV2JS Innovation LLP	0	2	0	0	19
Morphing Machines Pvt. Ltd.	0	0	0	0	9
Aheesa Digital Innovations Pvt. Ltd.	22	2	0	0	26
Calligo Technologies Pvt. Ltd.	1	1	1	1	45
Green Pmu Semi Pvt. Ltd.	16	4	0	3	40
Sensesemi Technologies Pvt. Ltd.	14	0	0	4	30
Moschip Technologies Limited	13	1	2	0	70
Wisig Networks Pvt. Ltd.	0	0	0	0	23
Mindgrove Technologies Pvt. Ltd.	13	0	0	0	35
Incore Semiconductors Pvt. Ltd.	7	2	0	0	22
Bigendian Semiconductors Pvt. Ltd.	1	0	0	0	38
Mbit Wireless Pvt. Ltd.	1	0	0	0	80
Sophrosyne Technologies Pvt. Ltd.	0	0	0	0	16
C2i Semiconductors Pvt. Ltd.	13	0	0	0	30
Mmrfic Technology Pvt. Ltd.	0	0	0	0	3
Netrasemi Pvt. Ltd.	2	1	0	0	55
Incise Infotech Limited	2	0	0	0	15
Total	151	16	6	10	666
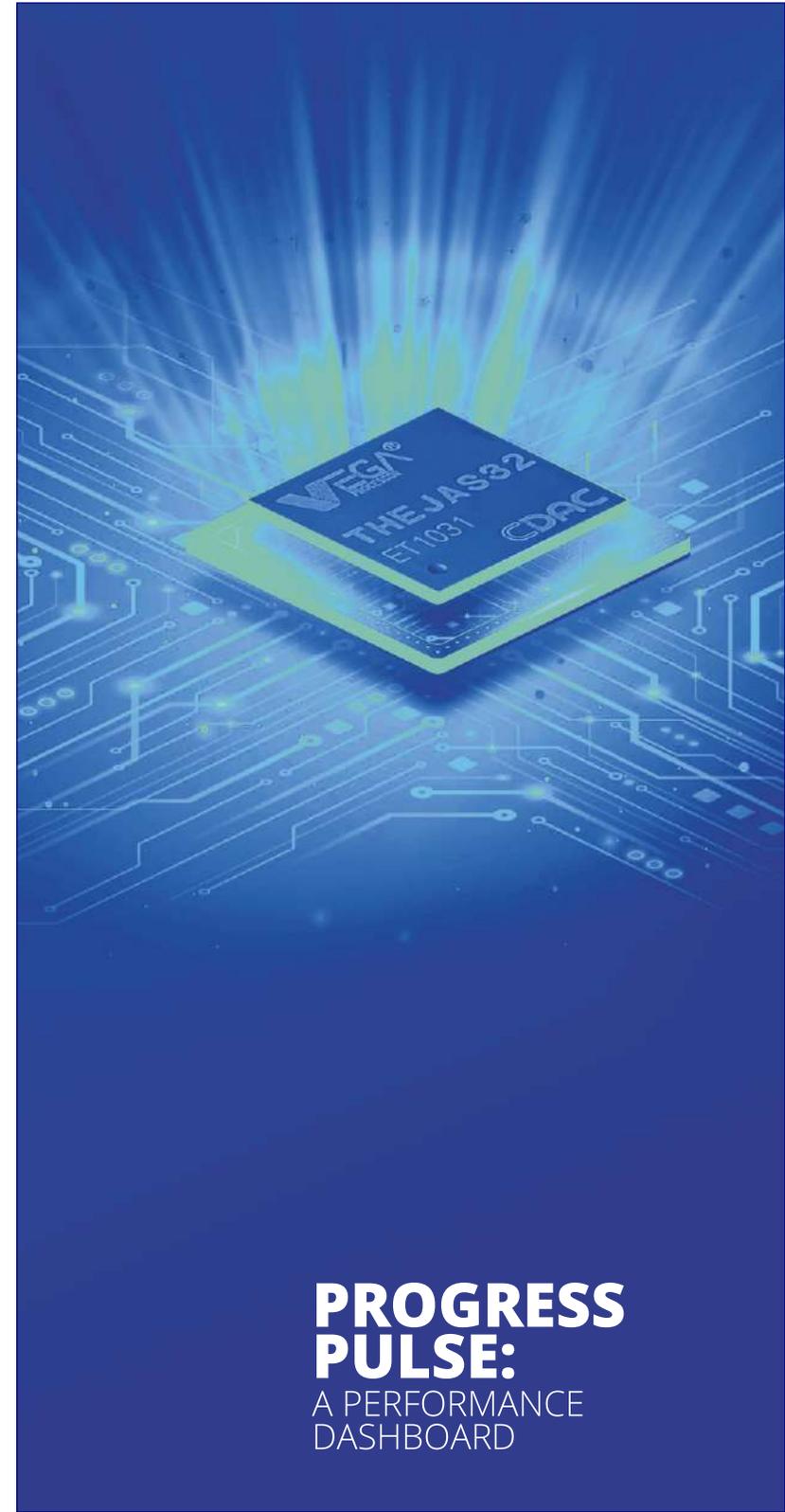
PROGRESS PULSE:
A PERFORMANCE DASHBOARD

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 4,959 accounts of government departments and agencies with over 7,142 cr+ transactions are integrated with Mobile Seva platform.

Mobile Seva Platform		
	April 2012 to December 2025	October 2025- December 2025
Accounts of Dept/Agencies integrated	4,959	63
No of Push SMS Transaction	7,142 Cr	221 Cr

मोबाइल
Mobile Seva

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

39

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-HASTAKSHAR / E-SIGN

Under a key initiative of the Government of India's Digital India Programme, C-DAC has introduced e-Hastakshar, an eSign service that enables citizens to digitally sign documents online in real time, providing a legally valid and convenient alternative to physical signatures. Over the past year, C-DAC has integrated this service with various departments, ministries, and agencies at the Central and State Government levels, as well as Union Territories, thereby facilitating its widespread institutional adoption.

C-DAC utilizes the services of the Unique Identification Authority of India (UIDAI) for online authentication and Aadhaar-based eKYC. The e-Hastakshar service supports multiple online Aadhaar authentication modes, including One-Time Password (OTP), Time-based OTP (TOTP), Fingerprint, Iris, and Face authentication (for mobile applications only), for effectively leveraging UIDAI's eKYC services.

As of December 2025, C-DAC has issued over 34.57 crore e-Signs, and more than 300 government agencies are utilizing the eSign service at the production level. Recently, the service has been integrated with the Rajya Sabha Secretariat for the Attendance Marking application. Several new organizations have also been onboarded at the production level, including the High Court of Madhya Pradesh, the Finance Department, Government of Telangana (FMIS – eVouchers), the Telangana IT Department, and the Tribal Research and Training Institute, Maharashtra. In addition, key agencies such as TNeGA, Government of Tamil Nadu, the Andhra Pradesh IT Department, the Centre for e-Governance, Karnataka, the Madhya Pradesh Agency for Promotion of Information Technology, and the National Informatics Centre are presently leveraging the eSign service at the production level. C-DAC has released the eSign 3.3 API, and during the period October to December 2025, more than 700 Signer IDs have been issued to employees of the Pune Municipal Corporation.

eSigns offered by C-DAC	
July 2016 to December 2025	October-December 2025
34.57 Crs	3.99 Crs

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

AADHAAR DATA VAULT (ADV) SERVICE

The Aadhaar Data Vault (ADV) is a national service designed and developed by C-DAC Mumbai, and is offered to government, PSU, and private entities. ADV provides a secure, scalable platform for the storage and management of Aadhaar numbers.

Beyond Aadhaar, ADV is also offered as a comprehensive solution for the secure storage and management of other Personally Identifiable Information (PII), such as PAN, Voter ID, Driving Licence, Passport numbers, and associated documentary proofs. This enables the creation of a unified, secure, and governed identity data ecosystem in line with national digital transformation objectives.

Component	Details (Inception to December 2025)	Details (October to December 2025))
Services Supported	73	7
Total Transactions	542 Crore	139 Crore

AADHAAR DATA VAULT

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 health 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.

As of now, eSanjeevani connects over 1.36 lakh spokes to more than 18,000 hubs, with additional extensions to over 326 correctional facilities. It is supported by over 2.42 lakh doctors, specialists, and healthcare professionals across all States and Union Territories. Till December 2025, eSanjeevani has facilitated over 43.91 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 14% by senior citizens, with services available in 14 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.

Continuing its evolution, eSanjeevani has recently introduced a series of strategic enhancements that reinforce its future readiness. The implementation of the Auto Assignment Doctor Module enables intelligent matching of patient clinical needs with the appropriate medical specialty, significantly improving consultation efficiency and patient experience. In parallel, a real-time governance dashboard with over 50 key performance indicators (KPIs) provides policymakers with clear, actionable insights to support performance monitoring, transparency, and data-driven decision-making. Fully aligned with the Ayushman Bharat Digital Mission (ABDM), the platform adheres to national standards for secure and interoperable digital health delivery. eSanjeevani serves as a core pillar of India's Digital Public Infrastructure (DPI) ecosystem, enabling scalable, standards-based, and trusted digital health services nationwide.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

ESANJEEVANI

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.

eSanjeevani Usage Report				
	November 2019 to December 2025		October 2025 – December 2025	
	Total Tele-Consultations	Registered Doctors	Total Tele-Consultations	Registered Doctors
eSanjeevaniAB-AAM	42,61,75,674	59,247	2,18,47,459	2,311
eSanjeevaniOPD	1,29,24,689	13,392	1,67,407	325
eSanjeevani	41,75,44,471	73,046	2,27,63,727	3,463

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.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-SUSHRUT – HOSPITAL MANAGEMENT INFORMATION SYSTEM

Type	Project Name	No. of Patient Visited		No. of Facilities	
		Till Sep 2025	Oct25-Dec25	Till Sep 2025	Oct25-Dec25
Super Speciality	e-Sushrut for AIIMS	4,05,82,484	33,19,599	17	
Super Speciality	IGIMS Patna	19,89,477	2,84,928	1	
Super Speciality	GIMS	9,73,697	99,175	1	1
Super Speciality	PGIMER	3,35,10,941	6,90,979	0	
Super Speciality	NIMS HMIS Hyderabad	50,38,216	2,35,398	1	1
State-wide	HMIS-NHM UP	3,27,39,193	45,23,732	468	0
State-wide	HMIS- DGME UP	2,12,18,129	25,80,649	22	0
State-wide	Punjab	10,75,64,851	87,63,586	3,728	250
State-wide	Telangana	4,03,82,055	43,81,315	97	97
State-wide	Odisha	7,09,76,684	64,96,446	1,297	1,146
State-wide	HMIS Maharashtra	2,94,07,850	59,65,561	1,311	1,178
State-wide	HMIS HP	65,56,451	15,15,700	45	1
State-wide	HMIS TN	59,80,719	85,81,569	495	337

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-SUSHRUT – HOSPITAL MANAGEMENT INFORMATION SYSTEM

Type	Project Name	No. of Patient Visited		No. of Facilities	
		Till Sep 2025	Oct25-Dec25	Till Sep 2025	Oct25-Dec25
State-wide	Goa State	34,02,327	5,68,930	46	0
State-wide	Arunanchal Pradesh	21,95,816	1,72,951	58	222
State-wide	Jharkhand	0	3,34,271		26
State-wide	Sikkim	12,61,503	1,72,615	14	18
PSU	e-Sushrut PAN Railways HMIS	5,59,06,855	49,82,535	709	0
PSU	SAIL BSL e-Sushrut HMIS	91,363	1,19,920	13	0
PSU	SAIL RSP e-Sushrut HMIS	6,09,204	1,20,918	6	0
PSU	SAIL BGH e-Sushrut HMIS	13,18,584	1,49,977	12	0
PSU	NHPC	3,14,604	24,518	32	1
PSU	CGHS's	65,25,031	48,13,359	490	538
	Total	46,85,46,034	5,88,98,631	8,863	3,816

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 4200 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 December 2025	July 2025 to December 2025
Total Blood Center Registered	4,458	67
Total Govt Blood Center Registered	1,282	05
No of Active Blood Centers	3,660	3,660
No of Blood Donation Camps	2,32,246	20,250
No of Donors Registered	1,09,45,011	4,69,994

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-AUSHADHI DRUGS AND VACCINE DISTRIBUTION MANAGEMENT SYSTEM (DVDMS)

It is a web-based programme that manages the supply chain of pharmaceutical supplies such as medications, sutures, and surgical items needed by various Drug Warehouses/Drug Stores. The primary goal of DVDMS is to determine the pharmaceutical demands of the state drug programme and the MoHFW's national level programme for various drug warehouses/drug stores so that all necessary materials/drugs are always available to be given to patients/beneficiaries in the state without delay. This involves item classification/categorization, item codification, item quality control, and lastly issuing pharmaceuticals to patients, who are the end consumers in the chain.

Sl.no	Institutions	January 2023 to December 2025 (Amount in Crore)		October 2025 to December 2025 (Amount in Crore)	
		Procurement Value	Distribution Value	Procurement Value	Distribution Value
A. States Implementation					
1	Andhra Pradesh	2344.15	1919.62	123.02	146.77
2	Assam	1005.71	108.17	80.47	8.05
3	Bihar	1978.99	1947.99	186.86	192.36
4	Gujarat	1618.63	1471.62	172.67	119.45
5	Himachal Pradesh	387.81	352.96	47.96	42.18
6	Jharkhand	87.22	122.89	7.49	10.11
7	Madhya Pradesh	1995.76	1578.48	197.58	175.55
8	Maharashtra (PHD & DMER)	1181.62	1313.00	61.62	108.33
9	Punjab	8173.74	15274.69	410.17	1811.07
10	Rajasthan	7292.07	5657.34	726.74	490.30
11	Telangana	1300.89	1157.49	64.26	53.55
12	Uttarakhand	194.11	175.06	25.08	23.99
13	Uttar Pradesh	2942.98	1545.68	285.17	410.34

eAushadhi (DVDMS) - Coverage across India alogwith Procurement and Issue Details for Drugs

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

E-AUSHADHI DRUGS AND VACCINE DISTRIBUTION MANAGEMENT SYSTEM (DVDMS)

Sl.no	Institutions	January 2023 to December 2025 (Amount in Crore)		October 2025 to December 2025 (Amount in Crore)	
		Procurement Value	Distribution Value	Procurement Value	Distribution Value
eAushadhi (DVDMS) - Coverage across India alogwith Procurement and Issue Details for Drugs				
	B. Union Territories (UT) Implementation				
1	Jammu and Kashmir	951.60	966.01	80.30	135.54
2	Puducherry	405.91	772.29	60.88	21.58
3	Lakshadweep	568.15	2993.85	6.68	448.29
4	Chandigarh	12.35	13.65	2.23	1.87
	C. Centralized / National Implementations				
1	DGAFMS- Ministry of Defence (Army, Navy, Airforce and subsidiaries)	3205.12	1668.53	549.03	222.36
2	Central Medical Services Society- MoHFW	6800.91	4258.88	612.73	506.79
3	Dept of Family Planning - MoHFW	3537.16	1524.44	624.66	208.95
4	National Tuberculosis Elimination Programe- MoHFW	772.41	5660.07	9.14	243.42
5	Medical Stores Organization- MoHFW	582.17	753.48	52.30	61.99
	D. Other Implementations				
1	Directorate of Medical Insurance-Govt of Andhra Pradesh	67.96	13.31	2.33	1.47
2	Directorate of Medical Insurance-Govt of Telangana	0.00	0.00	0.00	0.00

MAJOR PROJECT PERFORMANCE/ STATISTICS

NHSRC PROJECT – QUALITY CERTIFICATION SYSTEM FOR PUBLIC HEALTH FACILITIES

NHSRC Project is a flagship initiative undertaken by CDAC 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 Dec 2025	36	80822	2309	59	77319	1135
Oct 2025 to Dec 2025	36	4650	56	1	4578	15

Total Applications Count July 2023 to Dec 2025 – 43329			Oct 2025 to Dec 2025
Facility Type-wise Statistics	District Hospital (DH)	607	47
	Sub-District Hospital (SDH)	427	38
	Community Health Center (CHC)	973	92
	Primary Health Center (PHC)	4787	368
	Urban-PHC	1607	109
	Health & Wellness Center (HWC)	33792	3816
	Medical College Hospital	78	7
Certification Type – wise Statistics	NQAS	20250	4426
	LaQshya	492	81
	MusQan	111	0
Result Declared - 26897			95

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 mobile application (available Android/iOS/UMANG 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.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

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 December 2025	Oct 2025 - Dec 2025
Total Companies (Drugs & Medical Devices) Registered in the IPDMS 2.0	2795 (1663- Drugs, 1132 - Medical Devices)	975 (75 - Drugs, 900 - Medical Devices)
Number of Manufacturing Unit verified by the companies	9412	358
Number of Drugs verified by companies	69601	4144
Medical Devices Plant Registered	1434	646
Medical Devices Registered	163148	54494
Quarterly Stock Collection	25533	784
State Pricing Monitoring Resource Unit (PMRU) registered.	32	0
Form-I (Application for Price Fixation) Submitted	1044	108
Form-II (Submission of Revised Prices) Submitted	24295	648
Form-III (Quarterly Return) Submitted	84861	8418
Form-IV (Discontinuation of Production) Submitted	160	13
Form-V (Price List) Submitted	145882	25877
Form – VI (Medical Devices) Submitted	149008	52717
Complaints Registered through Web and Mobile Apps	7715	633
Legal Cases Registered for Overcharging	843	16

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 33 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

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

MUHS Project, undertaken by CDAC 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	778
University Employees On Boarded	354
Teachers On Boarded	24,000
Students On Boarded	3,11,865

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.

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

- All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha.
- Directorate of Medical Education & Research (DMER), Maharashtra. (for 65 Medical Colleges)
- Mahatma Gandhi Institute of Medical Sciences (MGIMS), Wardha, Maharashtra.
- Ispat General Hospital (IGH), Steel Authority of India Limited (SAIL) Rourkela, Odisha.
- Ispat General Hospital (IGH), Steel Authority of India Limited (SAIL) Bhilai

MAJOR PROJECT PERFORMANCE/ STATISTICS

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

Institute/Activity	College Configuration	Course Registered	Speciali zation	Students Registered	Number of Students in Hostels	Timetables Created	Digital Notice Created
All India Institute of Medical Sciences (AIIMS), Bhubaneswar	2	4	17	646	157	29	15
Ispat General Hospital, Steel Authority of India Limited (SAIl) Rourkela, Odisha	2	4	17	349	60	12	5
Mahatma Gandhi Institute of Medical Sciences (MGIMS), Wardha, Maharashtra	3	6	25	4931	188	15	22
Directorate of Medical Education & Research (DMER) Maharashtra	65	46	80	7033	1447	6	5

In addition, the system comes with a mobile app (available for iOS/Android platform) 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.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

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, 47,565 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	1st April 2024- 30th September 2025	1st October 2025- 31st December 2025	Total Achievement
Government Training – Advanced	C-DAC/ NIELIT	5,284	1,538	6,822
Government Training - Basic		5,719	1,454	7,173
Bootcamp		27,450	6,120	33,570
TOTAL LEARNERS		**38,453**	**9,112**	**47,565**

· Over 61 webinars have been conducted, 82+ PSUs have undergone skilling, and 75+ universities have been engaged till date.

State-Wise Learner's Engagement

States	No of Learner's certified under FSP
Maharashtra	10640
West Bengal	5926
Telangana	3903
Punjab	3413
Uttar Pradesh	3731
Tamil Nadu	3708
Delhi	2645
Tripura	2727
Kerala	3810
Karnataka	1167
Bihar	1418
Manipur	962
Sikkim	1109
Nagaland	576
Jammu & Kashmir	737
Assam	1093

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

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

SwaYaan 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, 858 activities have been conducted nationwide, encompassing academic, research & innovation, skilling & training, and other knowledge-sharing initiatives. These efforts have benefited 30,174 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

Major Highlights

- In the 4th quarter of 2025, SwaYaan contributed over 35+ activities across 14 categories of programs, benefiting more than 1000+ individuals and reaching a total of over 30,000+ beneficiaries till date.
- C-DAC and IdeaForge have partnered to strengthen India's drone-based emergency response capabilities.

Research & Innovation

- Three new Proof-of-Concept (PoC) proposals have been approved and are currently under development. In total, 25 PoCs in the Drone/UAS domain have been completed across 19 institutions, leading to the development of 14 hardware/UAV prototypes, 17 software solutions, 13 algorithms, 25+ IPR outputs (including papers, patents, thesis).
- Seven IPR paper publications, involving over 29 researchers have been registered as part of Research Deliverables.

Academic Activities

- Open online courses in the domains of Aerospace Engineering & Flight Mechanics, Wireless Communications & Networking, Navigation Systems & Control, Dynamic Systems & Control Engineering, and Robotics, Vision & Machine Learning, offered by four institutions, in in making.
- A six-month Certificate Programme in 'Unmanned Aircraft System Developer', has been launched with an enrolment of 30 participants.
- As part of the 6-Month UAS Developer Course, an expert talk session delivered by Dr. Abhishek (Professor-AE) from IIT Kanpur was organized by C-DAC Hyderabad.
- International Institute of Information Technology Hyderabad organized 'Master Trainer Program (MTP) for Technology Specific Work Theme "Allied UAS Technologies" with focus on Computer Vision and Motion Planning for UAVs' in October 2025.

Training & Skilling

- 24 Bootcamps in Drone/UAS conducted across 10 cities marking participation by 950+ Students.
- NIT Silchar has showcased the SwaYaan success story during the Event '28th National Integration & Youth Leadership Camp Assam' by Central Calcutta Science & Cultural Organization for Youth Nations in December 2025.
- A total of 240 Students successfully completed training on Junio Engineer Drone (NSQF – 5.5) and Drone Data Processor (NSQF 5) by ESSCI and TSSC respectively with considerable placement record.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

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

Beneficiaries across Project Work Theme

- Drone Applications
- Drone Electronics
- Allied UAS Technology
- Aeromechanics
- GNC Algorithm & simulation
- Across Work Theme

Institutional Involvement
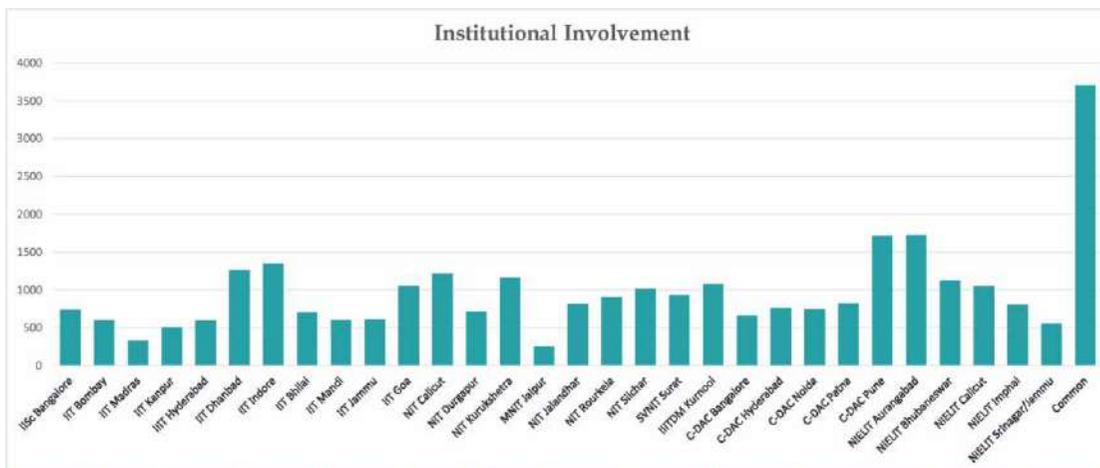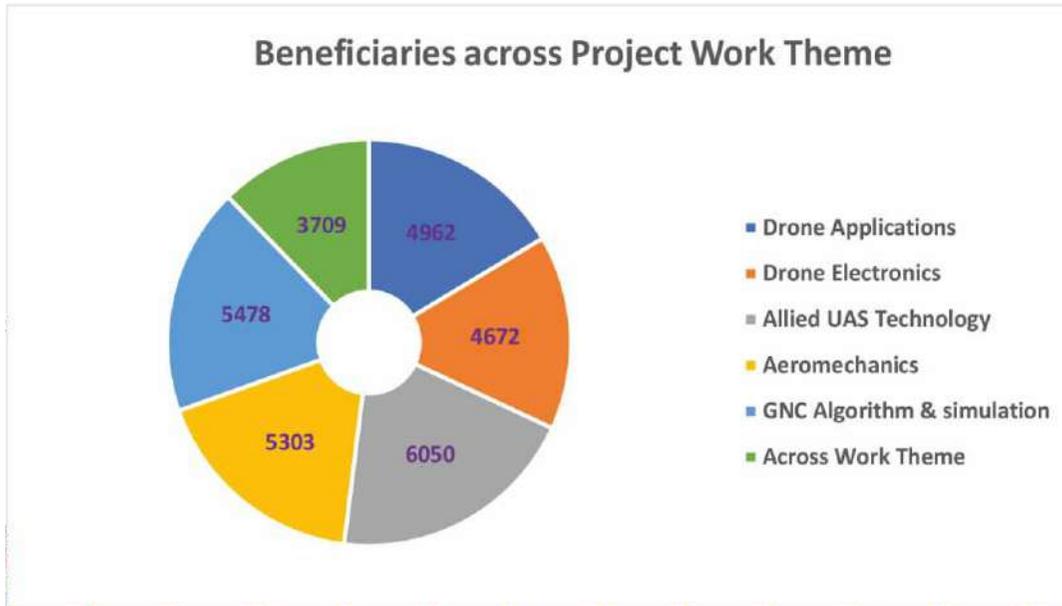
MAJOR PROJECT PERFORMANCE/ STATISTICS

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

The Ministry of Electronics and Information Technology (MeitY) is implementing a project on 'Information Security Education and Awareness (ISEA)' for generating human resources in Information Security and creating general awareness on various aspects of cyber hygiene/cyber security among the masses. The ISEA Project Phase-III was approved in Oct 2023 with a targeted approach for development of human resources for safe, trusted and secure cyber space. The project is implemented through select 50 premier academic institutions (IITs/ NITs), autonomous organizations of MeitY (C-DAC/ NIELIT), and Technical Universities in a hub-n-spoke mode.

MeitY in implementing the Information Security Education and Awareness (ISEA) Project Phase-III, approved in October 2023 towards development of human resources for safe, trusted and secure cyber space. The project is aimed to generate around 2.75 lakh human resources in the area of Information Security comprising of 45,000 skilled & certified Cyber Security Professionals (including CISOs, Deputy CISOs, Associate team of CISOs/Aspirants) and training of 2.3 lakh students (UG/PG level), research scholars, faculty, etc. in various formal/non-formal courses in academic and innovation activities. In addition, more than 12 crore beneficiaries are envisaged to be covered under Mass Awareness component through various activities in direct/indirect mode. The project is implemented by 50 premier institutions comprising select IITs, NITs, IIITs, C-DAC & NIELIT Centres and Technical Universities across the country.

So far, 19,330 candidates have been trained under academic, innovation and professional training programs. In addition, 2,558 awareness workshops on Information Security have been organized through direct/virtual mode for school & colleges students, teachers, faculty, Government personnel, general users, women, etc. covering 5,71,544 participants, 7,424 school teachers, faculty, police officers, etc. have been trained as master trainers in 19 training programs and around 10 crore estimated beneficiaries have been covered in indirect mode.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

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

Key Highlights of 3rd Quarter (Oct-Dec 2025)

1. One-day Awareness program cum Exhibition titled 'Cyber Hygiene Essentials: Safeguarding Digital Footprints' was conducted at MeitY on 13.10.2025 as a part of National Cyber Security Awareness Month (NCSAM) 2025 under the aegis of ISEA Project, which was attended by around 600 participants.

2. Cyber Security Innovation Challenge 1.0 was launched by Secretary, MeitY on 24.11.2025 aimed at students/researchers for designing innovative solutions for problem statements in ten thematic areas of Information Security.

3. 2nd Appraisal Workshop under ISEA project was conducted at NFSU Gandhinagar Gujarat from 27-28 November 2025 with 50 institutions from ISEA ecosystem.

4. ISEA Calendar and Diary 2026 was unveiled by Secretary, MeitY on 30.12.2025

5. Around 10 Faculty Development Programmes (FDPs), 13 bootcamps, 2 National Workshops, and 3 Expert Lectures were organized by various institutions covering approx. 1,000 participants.

6. 238 awareness workshops were organized across India for school and college students, teachers, faculty members, government personnel, general users, women, and other stakeholders, collectively reaching 57,639 participants nationwide.

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

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.

Work Based Learning
Sponsored by MeitY

PROGRESS PULSE:
A PERFORMANCE DASHBOARD

MAJOR PROJECT PERFORMANCE/ STATISTICS

WORK BASED LEARNING PROGRAMME (WBLP)

Enrolled Candidates	Apr 2022- Dec 2025	Oct 2025 – Dec 2025
Total Candidates	3526	603
SC	1028	176
ST	616	100
EWS	582	98
Women	1300	229

PROGRESS PULSE:
A PERFORMANCE
DASHBOARD

CENTRE OF EXCELLENCE (COES)

CENTRE OF EXCELLENCE (COE) AT MCTE, MHOW, MADHYA PRADESH

C-DAC has established Centre of Excellence (CoE) at MCTE, Mhow, Madhya Pradesh. This CoE aimed at driving research, development, and deployment of futuristic technologies that go beyond existing capabilities and to foster collaboration in research and development in niche technology domains with direct military applications which aims for the development of indigenous solutions under the Atmanirbhar Bharat and Digital India initiative.

The Centre of Excellence (CoE) at MCTE, Mhow, Madhya Pradesh, is presently in the final phase of completion, with substantial progress achieved in infrastructure development. The CoE facility will comprise eight fully functional rooms with a total built-up area of 4,076 sq. ft., providing adequate capacity for research, training, and administrative functions. In addition, at the Sarabhai facility, two rooms have been earmarked—one for hosting the 2-Petaflop Data Centre and another designated as a specialized training facility.

Regarding Research and Development (R&D) initiatives, four project proposals were submitted to MeitY. These proposals have undergone first-level screening by the respective working groups and are being regularly updated in accordance with feedback received from MeitY.

Under the National Supercomputing Mission (NSM), infrastructure requirements for a 2-Petaflop Data Centre, with an estimated outlay of 5 crore, have been finalized. The associated equipment is expected to be delivered by March 2026.

A dedicated training laboratory has been successfully established, equipped with ten workstations and a server, all of which have been delivered and installed. Additional resources, including four IoT kits and three drones, have also been provided to support practical, hands-on learning.

CENTRE OF EXCELLENCE (COES)

MARITIME DIGITAL CENTRE OF EXCELLENCE (MDCOE)

The maritime sector is a cornerstone of India's economic growth, logistics efficiency, and global trade integration. Recognizing the imperative for digital transformation, the Ministry of Ports, Shipping and Waterways (MoPSW) has adopted a structured and institutionalized approach to technology-led governance across the maritime ecosystem. This vision has culminated in the establishment of the Maritime Digital Centre of Excellence (MDCoE), formalized through a Memorandum of Understanding signed on June 26, 2025 between MoPSW and C-DAC, in the presence of Honorable Minister Shri Sarbananda Sonowal, Minister of Ports, Shipping and Waterways. Envisioned as the digital technology arm of the MoPSW, MDCoE is aligned with the strategic objectives of Maritime India Vision 2030 and the long-term national aspirations under Amrit Kaal Vision 2047.

CENTRE OF EXCELLENCE (COES)

MARITIME DIGITAL CENTRE OF EXCELLENCE (MDCOE)

MDCoE has been set up with clear vision to position India as a global leader in maritime digital transformation by establishing world-class technological infrastructure and fostering innovation in the maritime sector. With a mission to develop, implement, and scale cutting-edge digital solutions that enhance the operational efficiency, sustainability, and competitiveness of India's maritime ecosystem, MDCoE have identified 4 key verticals as focus areas to work upon:

- Research & Innovation
- Projects & Operations
- Collaboration and Outreach
- Training and Skilling

The office Setup of MDCoE at the identified location in Mumbai Port Authority is going to start soon. Till the time, interim MDCoE is operational from C-DAC Mumbai – Juhu Premises and it is headed by Chief Executive Officer, Shri Aditya Kumar Sinha (Executive Director, C-DAC Mumbai).

Discussions with Ports and Ministry are in progress to identify the problem areas and Gaps where MDCoE will intervene and provide the solutions. Some of the identified areas/projects where discussions and proposal preparation is going on are:

- Digital Twins for Ports
- Land Information management System
- 5G Captive Network for Ports
- Unified Data Model for Ports
- Indigenous Port Operation System
- Integrated Port Gate Automation
- Dredging Monitoring System
- Naudarshika for IWAI
- Maritime Knowledge Cluster

TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE

TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE

Launch of TinyML-IoT-THEJAS32 platform

The "TinyML-IoT-THEJAS32 platform" was launched at Supercomputing India 2025 on December 10, 2025 at Bengaluru. The TinyML-IoT-THEJAS32 platform leverages the VEGA series microcontroller to support efficient execution of TinyML models, integrating low-power processing, embedded AI inference, Security, and IoT connectivity on a single edge platform.

Launch of DHRUV64

C-DAC has launched India's first fully homegrown Dual Core Processor based SoC 'DHRUV64' developed as part of the DIR-V program of MeitY, which marks another significant milestone in India's semiconductor journey. The 1GHz 64-bit 'DHRUV64' System-on-Chip (SoC) is the third chip based on the VEGA series of indigenous RISC-V processors.

TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE
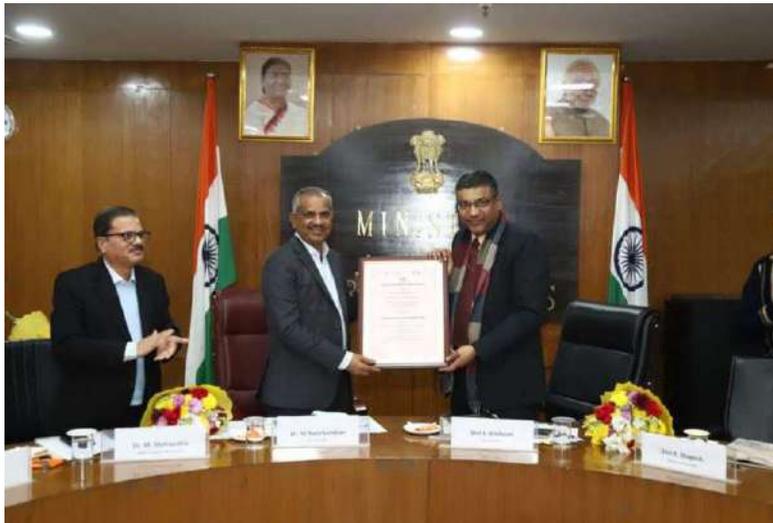
Launch of UES2S Platform for High-Resolution Urban Forecasting

Integrated Urban Modeling and Simulation Platform – Urban Environment Science to Society (UES2S) was jointly launched by Dr. M. Ravichandran, Secretary, Ministry of Earth Sciences (MoES), and Shri S. Krishnan, Secretary, Ministry of Electronics and Information Technology (MeitY), highlighting strong inter-ministerial cooperation for deploying advanced scientific systems for urban resilience and public safety on December 15, 2025.

Launch of India's Behavioral Data Platform

The "DataEcho" platform was officially launched on September 26, 2025 at C-DAC Delhi by Smt. Sunita Verma, Group Coordinator, MeitY in presence of senior MeitY officials. The Data-Echo Platform offers high-dimensional behavioral data across multiple modalities, including EEG, EoG, ECG, GSR, eye gaze, audio, and video.

TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE

Launch of Janakeeya Arogya Kendra (JAK) Mobile App

The Janakeeya Arogya Kendra (JAK) mobile application, developed by C-DAC Thiruvananthapuram in collaboration with the State Digital Health Mission (SDHM) (formerly eHealth Kerala), Government of Kerala, was officially launched by the Honorable Health Minister of Kerala in a function organized by the State Health Department for statewide rollout.
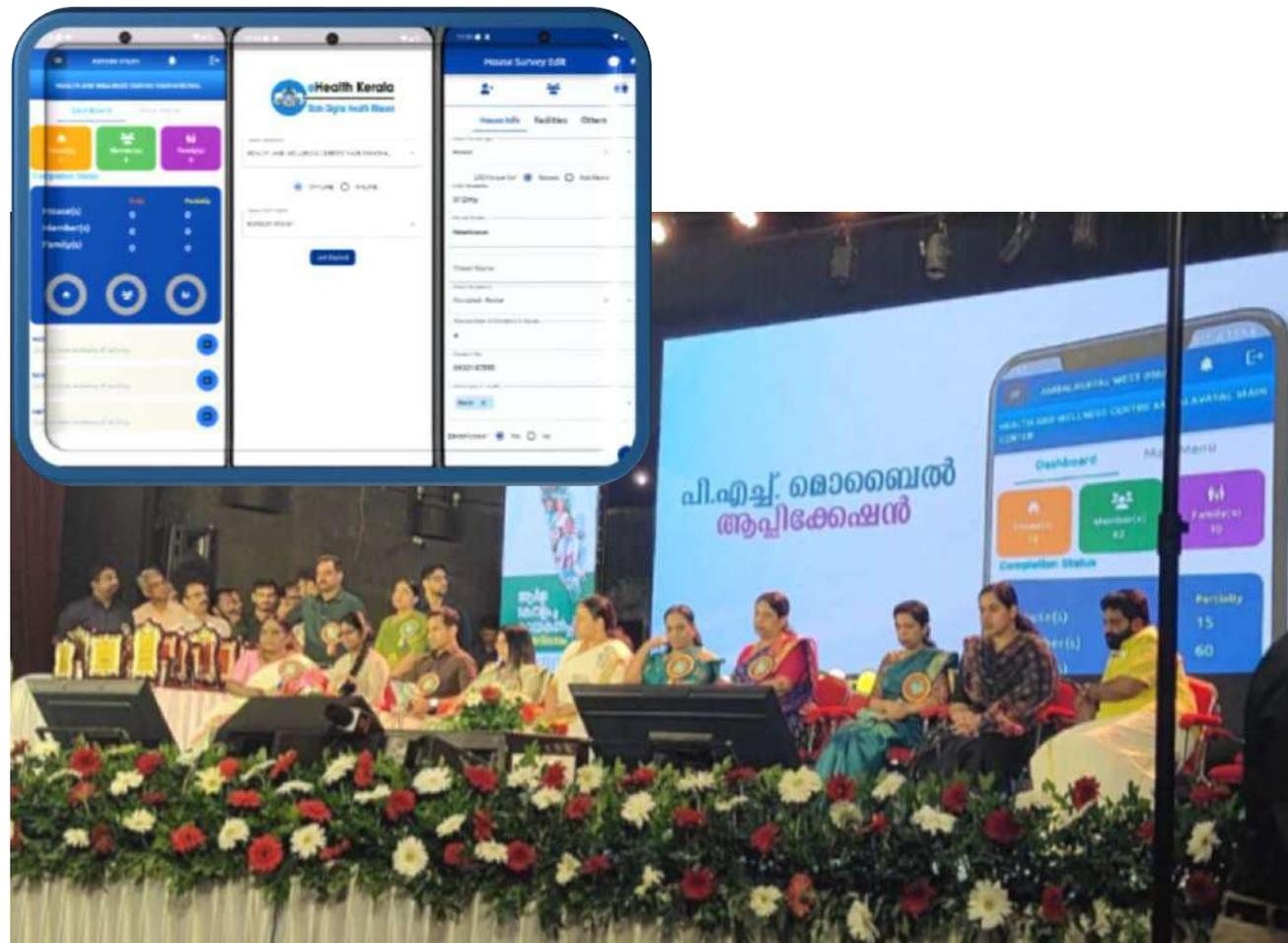
INTERNATIONAL
OUTREACH

INTERNATIONAL
OUTREACH

PARTICIPATION IN SUPERCOMPUTING CONFERENCE (SC 2025) HELD IN ST. LOUIS, USA

C-DAC has participated in the Supercomputing Conference (SC 2025) held in St. Louis, USA, during November 16–21, 2025. Rudra-based storage server was showcased at the Bharat Pavilion booth, highlighting indigenous HPC storage capabilities.

INTERNATIONAL
OUTREACH

VISIT OF CUBAN DELEGATION TO C-DAC DELHI

A delegation from the Embassy of the Republic of Cuba in India, led by H.E. Juan Carlos Marsan Aguilera, Ambassador of the Republic of Cuba to India, visited C-DAC Delhi on October 13, 2025. The primary objective of the visit was to explore potential areas of collaboration between C-DAC and XETID in the domains of digital health and governance solutions.

INTERNATIONAL
OUTREACH

ITEC SPECIALISED TRAINING PROGRAMME ON DIGITAL HEALTH

C-DAC, Mohali has concluded a one-week "Specialised Training Programme on Digital Health" for officials from Indonesia. The programme, held from October 30 to November 4, 2025, was conducted under the Indian Technical and Economic Cooperation (ITEC) initiative of the Ministry of External Affairs, Government of India, following a request from the Government of Indonesia.

INTERNATIONAL
OUTREACH

VALEDICTORY CEREMONY FOR INTERNATIONAL QUANTUM COMPUTING COHORT

C-DAC Delhi has successfully concluded its Certificate Course in Quantum Computing (CCQC), a flagship initiative under the ITEC Scheme of the Ministry of External Affairs (MEA). The rigorous 80-hour programme, conducted over two weeks from November 3 to 14, 2025, welcomed 15 nominated participants representing 15 countries: Ethiopia, Ghana, Kazakhstan, Bhutan, Mexico, Mongolia, Malawi, Sri Lanka, Niger, Nigeria, Papua New Guinea, Tunisia, South Sudan, the Slovak Republic, and Nepal.

INTERNATIONAL
OUTREACH

REGIONAL OPEN DIGITAL HEALTH SUMMIT (RODHS) 2025

Regional Open Digital Health Summit 2025 was held on November 19- 21, 2025 at New Delhi, marking a major milestone in strengthening digital health ecosystems across the WHO South-East Asia Region. Organised by the National e-Governance Division (NeGD), MeitY, in collaboration with the National Health Authority (NHA), Ministry of Health & Family Welfare (MoHFW), the World Health Organization – South-East Asia Regional Office (WHO-SEARO), and UNICEF, the three-day summit aimed to accelerate standards based digital health transformation and cooperation across the region

EVENTS

SUPERCOMPUTING INDIA 2025

The conference was inaugurated by Shri. Ashwini Vaishnaw, Hon'ble Minister for Electronics and Information Technology, Government of India, along with Shri. Jitin Prasada, Hon'ble Minister of State for Electronics and Information Technology. Addressing policymakers, researchers, industry leaders, and academia, the dignitaries emphasized advanced computing as a strategic national capability critical for governance, economic growth, scientific leadership, and digital sovereignty.

Supercomputing India 2025 (SCI2025), organized by the C-DAC, marked a historic milestone as India's first global conference dedicated to High Performance Computing, Artificial Intelligence, Quantum Technologies, Semiconductors, and Cybersecurity. Hosted in Bengaluru, SCI2025 aligned strongly with the national vision of Viksit Bharat @2047, reflecting India's transition from technology adoption to indigenous design, development, and deployment. SCI2025 placed India alongside global supercomputing forums such as SC (USA), ISC (Germany), and SCAsia.

TECH EXPO

SCI2025 witnessed the inauguration of the Tech Expo by Shri Amitesh Kumar Sinha, Additional Secretary, MeitY, and CEO, India Semiconductor Mission, in the august presence of Shri. Sudeep Shrivastava, Joint Secretary, MeitY, Government of India; Prof. Anil Sahasrabudhe, Chairman, Executive Committee, NAAC and other eminent dignitaries.

Featuring 187 sponsors and exhibitors, the Tech Expo showcased innovations across HPC, Artificial Intelligence, Quantum Technologies, Semiconductors, Cybersecurity, and advanced software platforms. The Expo emerged as a vibrant bridge between research, policy, and real-world deployment.

SUPERCOMPUTING INDIA 2025

EVENT HIGHLIGHTS — The scale and impact of SCI2025 are reflected in its numbers

159 SESSIONS	**342** SPEAKERS	**8286** ATTENDEES	**5873** DELEGATES
187 SPONSORS & EXHIBITORS	**20** COUNTRIES REPRESENTED	**46** RESEARCH PAPERS	**2413** ACADEMICIANS
44 POSTERS	**10** PANELS	**04** BIRDS OF A FEATHER (BoF) SESSIONS	**17** WOMEN IN TECHNOLOGY SESSIONS / **09** KEYNOTES AND PLENARY SESSIONS
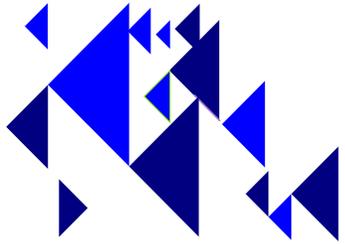
OVERALL HIGHLIGHTS: A GLOBAL PLATFORM FOR COLLABORATION AND INNOVATION

SCI2025 unfolded over five days as a comprehensive ecosystem-building platform, hosting 159 sessions, 342 speakers, and over 8,000 attendees from more than 20 countries. Global keynote and plenary speakers offered diverse perspectives on the future of advanced computing.

The conference featured 46 peer-reviewed research papers selected through a stringent international review process, with accepted papers slated for publication in IEEE Xplore. Specialized forums such as the RISC-V Summit, Cyber Resilience Conclave, the ChipIN Conclave, IndiaAI Pre-Summit, Global Connect, PARAM Shavak User meet, NSM User Meet, and Vice Chancellors' Meet deepened both technical and strategic discourse.

Participants undertook industrial visits to the PARAM HPC facility at C-DAC Bengaluru and Kaynes Electronics Manufacturing Pvt. Ltd., Chamarajanagar, gaining firsthand exposure to large-scale supercomputing infrastructure and advanced electronics manufacturing practices, reinforcing the conference's focus on real-world deployment and industry integration.

LAUNCH OF CYBER HYGIENE BOOK

Shri S. Krishnan, Hon'ble Secretary MietY with other dignitaries of MeitY, launched Cyber Hygiene books for Government officials and Children on October 13, 2025.
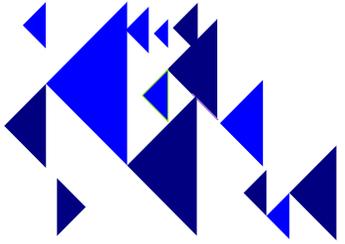
LAUNCH OF CYBER SECURITY INNOVATION CHALLENGE

Cyber Security Innovation Challenge 1.0 was launched by Shri S. Krishnan, Hon'ble Secretary on November 24, 2025 aimed at students/researchers for designing innovative solutions for problem statements in ten thematic areas of Information Security.

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.

TRANSFER OF TECHNOLOGIES OF INDIGENOUS AGRI-ELECTRONICS PRODUCTS UNDER AGRIENICS PROGRAMME

Transfer of Technologies of Indigenous Agri-Electronics Products developed under AgriEnIcs Programme was carried out at MeitY on October 08, 2025.
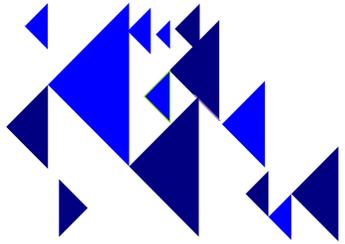
As part of the preparatory activities for the India AI Impact Summit 2026, scheduled during February 2026 in New Delhi, C-DAC has hosted pre-summit events and workshops on areas such as AI in the financial sector, Intellectual Property (IP), etc. during November 2025
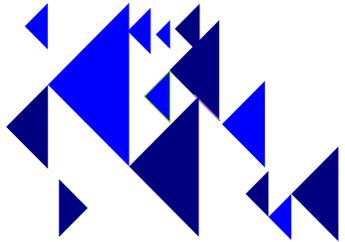
Shri S. Krishnan, IAS, Secretary, MeitY, Government of India, inaugurated newly established Cyber Physical Systems (CPS) Laboratory at C-DAC Patna on December 03, 2025.
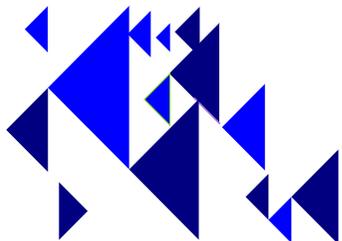
Accelerating Scientific Discovery in Chemistry and Materials Science with HPC and AI (ACMS 2025) under National Supercomputing Mission (NSM) was organised by C-DAC on December 17, 2025 at Hyderabad.

BACKEND
SQUAD

CISO DESK

- Major Policies namely, Information Security Governance (ISMS) Ver0.2a and Information Security Policy (ISMS) Ver 0.3a were reviewed and amended with current context and controls.

- Continuous monitoring of digital assets across C-DAC is now fully operational. The dashboard has been made available to both the CISO and NISO, enabling them to review all relevant security information in real time.

- As part of National Cyber Security Awareness Month (October 2025), a comprehensive and multi-dimensional cybersecurity awareness program was successfully conducted with the objective of fostering a safe, secure, and resilient cyber environment within the organization. The month-long initiative was designed to move beyond one-time awareness sessions and instead build sustained cyber hygiene, informed behaviour, and a strong security culture among employees.

- Actions have been taken for the various threat incident reported during the period.

- NCSAM 2025: The GLAMS Digital Defender Challenge was conducted in collaboration with the GLAMS team of CDAC Patna.

CIO DESK

The CIO team, in coordination with designated NIOs across C-DAC centres, continued focused efforts towards strengthening Shared IT Services (SITS), enhancing digital platforms, and progressing enterprise-wide system integrations. The quarter saw steady advancement of pilot deployments, system integrations, security audits, and preparatory activities for wider rollouts. The following are some of the major activities and updates undertaken during the quarter:

- **Single Sign-On (SSO) – e-Pramaan** - To improve and strengthen multi factor authentication, an e-Pramaan–based Single Sign-On (SSO) framework was implemented for Shared IT Services (SITS).

- **Unified Dashboard** - A Unified Dashboard is established as a single, centralized entry point for accessing shared and centre-specific IT services. The dashboard is fully integrated with the e-Pramaan–based Single Sign-On (SSO) framework, providing secure, centralized, and role-based authentication across applications.

- **Email Migration and gov.in Domain Registration** -
  - The cdac.gov.in domain was successfully activated by NIC, marking a key milestone in consolidating C-DAC's digital identity. The official C-DAC website is now accessible at https://cdac.gov.in, with preparations underway for the launch of a refreshed website.
  - As part of the phased email migration initiative, official email IDs under the @cdac.gov.in domain were provisioned for Executive Directors, Centre Heads and Corporate HoDs, laying the foundation for organization-wide adoption.

- **BOSS OS** - Pilot deployment of the newly released Enterprise BOSS OS continued at identified centres during the quarter. Testing across desktops and laptops at multiple centres demonstrated stable performance, satisfactory hardware compatibility, and reliable network functionality.

- **EDA Management Tool** - Enhancements to the EDA Tools Management application, including reservation-related features, were completed. Pilot deployment of the updated system continued during the quarter across selected user groups.

- **e-Mulazim Containerization** - POC for docker containerization of the e-Mulazim application was completed, enabling improved deployment consistency, scalability, and ease of maintenance across environments.

सी डैक
CDAC

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● Bengaluru ● Chennai ● Hyderabad ● Kolkata ● Mohali ● Mumbai ● New Delhi ● Noida ● North East (Silchar) ● Patna ● Pune ● Thiruvananthapuram