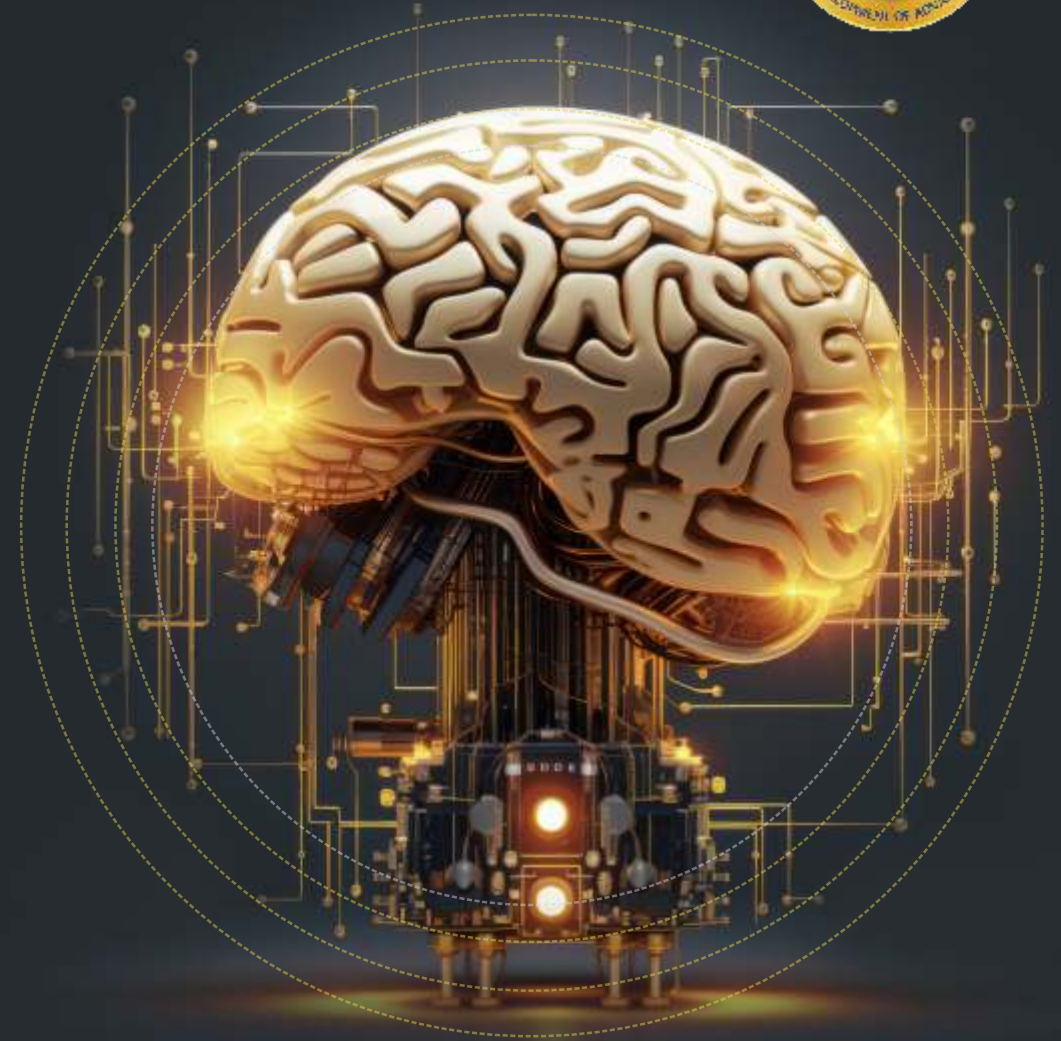


# techzine

C-DAC R&D DIGEST

OCTOBER 2023- DECEMBER 2023

VOLUME 1, ISSUE 3



| IDEAS TO ACTION | PROGRESS PULSE: A PERFORMANCE DASHBOARD | TECH ROLL-OUTS |

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## Message from Director General

I am pleased to see that third issue of Techzine R & D Digest of C-DAC is getting released. I congratulate the Corporate R&D team for the same.

Techzine is enabling to proliferate the research and development activities of C-DAC across various Ministries including MeitY, academia, research institutions, industries, and other stakeholders.

It is heartening to mention that the second issue of Techzine was released by Shri. Vijay P Bhatkar, Chairman TAC during the 8th Technical Advisory Committee (TAC) meeting of C-DAC held during November 2023. The magazine was well appreciated by the TAC members and senior officials from MeitY.

I wish Techzine R&D Digest to leverage multidisciplinary research initiatives & collaborations and appeal all to ponder upon and focus those activities towards contributing to nation building.



**Shri Magesh Ethirajan**



## Message from Editorial Board

We are happy to see that second issue of Techzine was released during the 8th Technical Advisory Committee (TAC) meeting of C-DAC and it has helped to proliferate the research and development activities of C-DAC across various Ministries including MeitY, academia, research institutions and Industries and other stakeholders.

We are overwhelmed to see the response from the teams across all C-DAC centres for providing their inputs for Techzine. Looking forward to see more such inspiring articles for the upcoming editions of Techzine.

### Editorial Board

- Shri Pramod P.J., Head – Corporate R&D, C-DAC
- Shri Manoj Gopinath, Head M&C, Associate Director, C-DAC Pune
- Shri Shripad Shriram Kalambkar, Joint Director, Corporate R&D, C-DAC
- Shri Anant Kelkar, Manager, Corporate R&D, C-DAC
- Shri Sanjay Chakane, Admin Officer, Corporate R&D, C-DAC

# IDEAS TO ACTION



1

NEW MEITY PROJECTS

# IDEAS TO ACTION



**Name of Project:**

**Study and Analysis of Various Social Media Platforms for Safe and Trusted Internet**

CI: Dr. Mary Jacintha M, C-DAC Noida

Co-CI: S. ShivaKarthik, C-DAC Pune

Co-CI: V Solai Murugan, C-DAC Chennai

**Brief Description:** This project is to study, analyze and flag "Unlawful Contents" from social media posts/comments by gathering data from various social media platforms (Twitter (X), Facebook, Telegram, Instagram etc.) using APIs and data scraping techniques. It provides an automatic flagging of Unlawful contents or issues of potential concerns for National Security from social media using C-DAC in-house State of Art AI-NLP techniques to enable a fair, safe and trusted Internet, preventing the platforms to be used for unlawful activities destabilising nation. Automatic identification of domains and Entity of Interests using C-DAC in-house State of Art AI-NLP techniques to understanding user behaviour, flag potential abuses of the platform like mentions of drugs, weapons etc.



# 2

NEW MEITY PROJECTS

# IDEAS TO ACTION

**Name of Project:**

Design & Development of 'Dhwani'-Advanced Indigenous Mixed Signal and Bluetooth Enabled Hearing Aids

CI: S. Krishnakumar Rao, C-DAC, Thiruvananthapuram

CO-CI: Gopan George, C-DAC, Thiruvananthapuram

**Collaborators:**

- Indian Institute of Technology, Madras
- Artificial Limbs Manufacturing Corporation of India (ALIMCO)
- Keltron

**Brief Description:** The project aims to design and engineer 'DHWANI' - Advanced indigenous mixed signal and Bluetooth enabled Hearing Aids having superior performance at an affordable price which can be used by the hearing impaired persons. This project will be a successor to the highly successful and award winning TARANG series hearing aids designed and developed by C-DAC. The project involves design and development of NAADA 2.0 hearing aid ASIC and DHWANI hearing aids. Collaborating with IIT Madras as the design partner, and ALIMCO & KELTRON as industry collaborators, this project aims to deliver innovative and inclusive hearing solutions.

NEW MEITY PROJECTS

# IDEAS TO ACTION



3

**Name of Project:** Design and Development of Advanced Forensics Data Analytics

**CI:** Ms. Dija S, C-DAC Thiruvananthapuram

**Co-CI:** Shri. Anwer Reyaz J, C-DAC Thiruvananthapuram  
Ms. Amala R, C-DAC Thiruvananthapuram

**Collaborators:** • C-DAC Bangalore • IIT Palakkad  
• State FSL, Kerala • Kerala State Electricity Board (KSEB)  
• Federal Bank, Kerala

**Brief Description:** The project encompasses 4 sub-projects. The objective of the first sub-project is to design and develop a new FinTech Forensics Tool. The second sub-project is to design and develop a new IoT Forensics Tool. The main sub-project in this project is the Design and Development of Advanced Data Analytics Forensics Tool. The objective of the fourth sub-project is the enhancement of the following 6 Existing Cyber Forensics Tools

- a) CyberCheck – Disk Forensics Tool for Data Recovery and Analysis
- b) Win-LiFT – Windows Live Forensics Tool
- c) Advik CDR Analyzer - CDR/IPDR Analysis Tool
- d) WebInvestigator – Internet Forensics Tool
- e) PhotoExaminer – Image Forensics Tool
- f) TrueImager – H/w based Disk Imaging Tool

C-DAC Bangalore is an Implementing Partner for developing the Machine Learning Models in the FinTech Forensics Project. The IIT Palakkad is an implementing partner in the IoT Forensics Project for developing the vulnerability analysis module. KSEB, Federal Bank and State FSL Kerala are the User Agencies of the proposed tools



NEW MEITY PROJECTS

# IDEAS TO ACTION

**Name of Project:** Information Security Education and Awareness (ISEA) Project Phase-III

**CI:** PRL Lakshmi Eswari, C-DAC, Hyderabad

**Co-CI:** Dr Ch A S Murty, C-DAC, Hyderabad

**Collaborators:** 50 Institutions comprising of IITs, NITs, IIITs, C-DAC/NIELIT, State/Central and Technical Universities (Selection of institutions is under process)

**Brief Description:** This project aims to - "Human Resources Development for safe, trusted and secure cyber space", over a period of 05 years. It comprises of 4 (four) verticals:

- a) Generating Highly Skilled and Certified Cyber Security Professionals including CISOs
- b) Training & associate members of CISO team
- c) Grooming students towards products and solutions development in Cyber Security, Strengthening Research & Education at academic level
- d) National Awareness program of Cyber awareness for Digital Nagriks.

5

**Name of Project:** Precision Instrumentation Amplifier (PRIAMP)

**CI:** Haneesh Sankar T P, C-DAC, Thiruvananthapuram

**Co-CI:** Sarath Chandran R, C-DAC, Thiruvananthapuram

**Collaborators:** Satish Dhawan Space Centre (SDSC SHAR), ISRO

**Brief Description:** The project envisages design and development of a high accuracy instrumentation amplifier (PRIAMP) for the measurement of critical parameters like thrust, pressure, displacement, firing current for the static firing testing of rockets and missiles. PRIAMP is a mission critical equipment indigenously designed and developed for space applications.

**IDEAS  
TO  
ACTION**  
(External Funding)



**Name of Project:** Ultrasonic Solid-propellant Burn Rate Measurement System V2 (USBRMS V2)

**CI:** Haneesh Sankar T P, C-DAC, Thiruvananthapuram

**Co-CI:** James Varghese, C-DAC, Thiruvananthapuram

**Collaborators:** Advanced Systems Laboratory (ASL), DRDO, Jagdalpur, Chhattisgarh

**Brief Description:** Ultrasonic Solid-propellant Burning Rate Measurement System (USBRMS) is an ultrasonic pulse-echo device for the measurement of burning rate of solid propellant used in rocket motors. The system works on the principle of ultrasonic technique by repeatedly measuring the thickness of a burning propellant specimen. User can measure the burn rate of different solid propellant samples using the USBRMS and can predict the performance of solid propellant motors used in space flights and missiles. Accurate measurement of Burn Rate is very important for the prediction of trajectories of missiles and rockets. Objective of the project is to setup an USBRMS system at SFC, ASL, DRDO, Jagdalpur, Chhattisgarh. The USBRMS includes a high pressure- high temperature (300bar, 3000deg C) burning chamber, electronics unit for data collection, laptop for data display, replay and burn rate computation.

**IDEAS  
TO  
ACTION**  
(External Funding)

**Name of Project:** Buoy sensor data collection, recording, transmission and operational support

CI: Byju C, C-DAC, Thiruvananthapuram

Co-CI: Aravind C R, C-DAC, Thiruvananthapuram

Harikrishnan C S, C-DAC, Thiruvananthapuram

**Collaborators:** Naval Physical and Oceanographic Laboratory (NPOL), DRDO Kochi

**Brief Description:** The project envisages integration of meteorological, oceanographic, acoustic and surveillance sensors with electronic modules and power system components on a moored surface buoy platform for sensor data collection, processing, recording and transmission to onshore data reception centre, installation and commissioning of the system at sea, and operation and maintenance for one year continuous data collection.

**IDEAS**  
TO  
**ACTION**  
(External Funding)

**Name of Project:** Advanced Acousto Ultrasonic NDT system SoUNDS Mk2 R5 for ISRO Propulsion Complex, Mahendragiri

CI: Harikrishnan CS, C-DAC Thiruvananthapuram

Co-CI: Nimmy Mathew, C-DAC Thiruvananthapuram

**Collaborators:** VSSC Thiruvananthapuram

**Brief Description:** The project envisages the design & development of an Advanced Acousto Ultrasonic NDT System, which is the portable version of SoUNDS system commonly used for inspection of composites and porous materials used in rockets and space vehicles, for IPRC Mahendragiri. It is a system for the Non Destructive Testing and Evaluation of materials, using Sonic and Ultrasonic frequencies. SoUNDS system is optimized for porous and composite materials where conventional high frequency ultrasonic NDT systems will not be useful. It is used for study and analysis of certain material properties and for detecting flaws in the material by measuring the propagation of sound wave in the material. The low frequency operation of SoUNDS makes it useful in situation where common high frequency NDT system cannot be used. SoUNDS can be used for detecting internal flaws in test specimens including heat shields, thermal tile, inhibition material layers etc. Sounds Mk2 R5, the fifth model in the SoUNDS series, is an upgraded version of Acousto Ultrasonic NDT System currently in use at ISRO labs.

**IDEAS  
TO  
ACTION**  
(External Funding)



**Name of Project:** Pathways to Resilience and Mental Health

**PI:** Ramesh Naidu Laveti , C-DAC Bangalore

**Collaborators:** NIMHANS, AIIMS, NIMH, ICMR etc.

**Brief Description:** The main objective is to conduct Longitudinal study to trace the normal and deviant neuro developmental trajectories which underlie resilience and vulnerability to mental illnesses; and understand the impact of the interactions between genetic programming and exposures to environmental insults/ enablers in this process.

**IDEAS**  
TO  
**ACTION**  
(External Funding)





# PROGRESS PULSE:

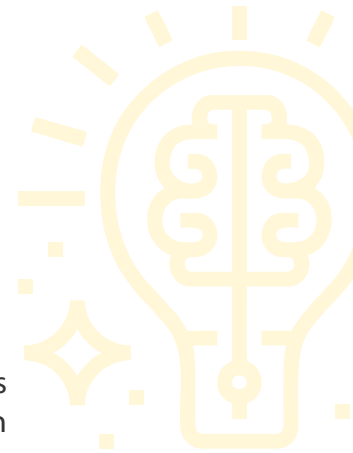
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# IPR PORTFOLIO

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 2023)				Quarterly IPR portfolio of C-DAC (October 2023- December 2023)			
	Patents	Copyrights	Trade marks	Designs	Patents	Copyrights	Trade marks	Designs
<b>Applied/ Filed (Pending)</b>	60	7	4	0	5	3	2	1
<b>Granted/ Registered</b>	91	171	19	0	5	11	1	0
<b>Total</b>	<b>151</b>	<b>178</b>	<b>23</b>	<b>0</b>	<b>10</b>	<b>14</b>	<b>3</b>	<b>1</b>



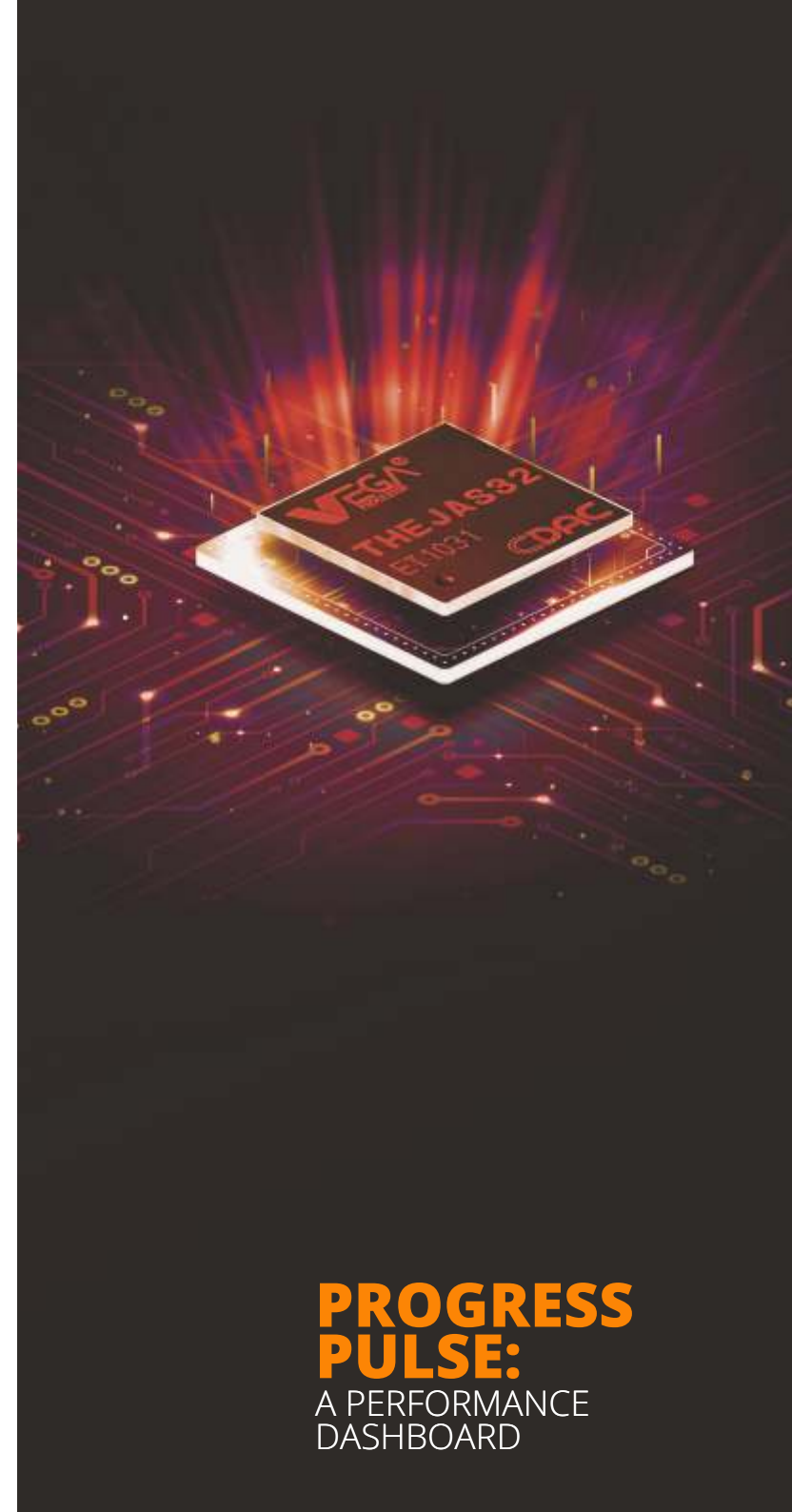
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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**Digital India RISC-V (DIR-V) Program:** A Nationwide Roadshow on DIR-V VEGA processors jointly organized by C-DAC and IEEE India Council was held concurrently at 15 institutions across India with around 1000 students, industry professionals and faculty being trained. The roadshow was inaugurated by Shri. Rajeev Chandrasekhar, Honorable Minister of State for Electronics and Information Technology, Govt. of India. There were presentations by eminent personalities from industry with expertise in the RISC-V domain. The comprehensive training programme, encompassing hands-on sessions, offered a deep dive into the VEGA series of processors and ecosystem including ARIES boards, SDK and application development.

MoA signed with Aheesa Digital Innovations for licensing VEGA64-bit Processor core for design of “Vihaan”, Network SoC for GPON for Broadband connectivity.

THEJAS Processor Module based on THEJAS32 chip for digitisation and processing has been developed by Trachealth Technologies Pvt Ltd (incubated at IISc, Bangalore) and added to the E-LAGORi platform, which is a modular electronics development platform for hardware system developers. It provides seamlessly connectable modules that can be stacked one over the other, to prototype a system.



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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**Design Linked Incentive (DLI) Scheme:** C-DAC Noida is spearheading the in successful execution of Design Linked Incentive (DLI) Scheme under India Semiconductor Mission (ISM) with the AIM to Nurture 100 Start-up/MSMEs in the Field of Semiconductor design. So far, nine start-ups and MSMEs have received administrative approval for support totalling approved outlay of Rs. 7634.69 Lakhs. Two more start-ups and MSMEs and are in line for approvals with their Technical Evaluation successfully completed. Under Design Infrastructure support, National EDA Tool Grid had been set up to provide free access to the centralized facility of EDA tools for chip design activities. Indian Start-ups and MSMEs can submit EDA Tool request application through DLI portal to access the chip design infrastructure made available by ChipIN under the DLI Scheme.

**Emergency Response Support System (ERSS-112):** Emergency Response Support System (ERSS) is the vision of Govt. of India to launch a nationwide, unified emergency response system with a single emergency number '112', for all kinds of emergencies and distress calls from across the country. This intelligent system is focused at providing instant support to all the citizens of the country especially, women and children whenever they request help while facing extreme distress situations.

# MAJOR PROJECT PERFORMANCE/ STATISTICS

C-DAC is the Total Service Provider (TSP) for MHA, Govt. of India for ERSS. The entire ERSS solution is developed indigenously by C-DAC, Thiruvananthapuram which include the whole set of emergency signal gateways, business processing layers, integrations layers, digital map modules and graphical user interfaces. All the algorithms behind the automated signal distribution, voice logging and signal processing are also developed by C-DAC. Launched first in 2018, now running stable in 28 States.

ERSS - 112		
Particulars	Nov 2018 to Sept 2023	Oct 2023 to Dec 2023
Operationalization of ERSS-112	28 States/UTs	-
Users for Mobile Data Terminal App for rescue vehicles	13,718	397
112 India Mobile App Users	12,12,491	1,00,124
ERSS Extension to Disaster Management	35 States/UTs	-

## Haryana 112

From October 2023 to December 2023, we completed the installation of 397 Mobile data terminals and the integration of 300 Fire service vehicles and 97 ambulances with Haryana 112.

## ERSS- Phase II - Next Gen Emergency Response Support System (Ng112)

In ERSS Phase II, the focus is on continual improvement introducing a highly scalable and robust, mobile and web-based system, intelligently tuned to the field requirements of state police departments. Software development as well as the procurement of various components – hardware, COTS software, and connectivity services are in progress.



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# MAJOR PROJECT PERFORMANCE/ STATISTICS

## Integration with Child Helpline-1098 and Women Helpline-181 Services

Automation of Child Helpline-1098 (CHL), Automation of Women Helpline-181(WHL), and integration with ERSS-112 are two projects of MoWCD, Govt. of India. C-DAC, Thiruvananthapuram is the Total Service Provider (TSP) for these projects and has developed a web-based solution for automating the CHL/WHL services and is deployed in all the States/UTs where the new CHL/WHL system is installed. These projects also include the automation of all district-level units across the country and this process is currently in progress.

CHL-1098/WHL-1081 and Integration with ERSS-112		
Particulars	July 2023 to Sept 2023	Oct 2023 to Dec 2023
Installation, Training and Operationalization of Child Helpline – 1098 system and integration with 112	31 States/UTs	5 States/UTs
Automation of CHL at District Child Protection Units	-	238
Installation, Training and Operationalization of Women Helpline – 181 system and integration with 112	21 States/UTs	9 States/UTs
Automation of WHL at One Stop Centres	-	39



**PROGRESS PULSE:**  
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# 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 the delivery of public services to citizens and businesses over mobile devices using SMS, USSD, IVRS, CBS, LBS, apps and AppStore. 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 4755 accounts of government departments and agencies are integrated with the Mobile Seva platform. Over 5,791 crore transactions and 9 cr + apps download have taken place.

Mobile Seva platform		
	April 2012 to September 2023	October 2023 to December 2023
Accounts of Dept/Agencies integrated	4695	60
No of Push SMS Transactions	5582 Cr	209 Cr
No of apps	1555	200



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# MAJOR PROJECT PERFORMANCE/ STATISTICS

FutureSkills PRIME Report				
	December 2019 to Sept 2023		October 2023- December 2023	
Sign Ups	15.15 Lakhs		1.37 Lakhs	
	Enrolled	Certified	Enrolled	Certified
Government Officials Training	6102	4697	298	256
Training of Trainer	1681	1374	104	0
Bridge Course Registration	16792		3147	

**Future Skill PRIME - Programme for Re-Skilling/Up-Skilling of IT Manpower for Employability:** MeitY and NASSCOM have jointly conceived the Programme titled, “FutureSkills PRIME, under the Champion Sector Service Scheme (CSSS). The Programme is envisaged to provide re-skilling/up-skilling opportunities to 4.12 Lakh IT Professionals of B2C beneficiaries in ten(10) emerging technologies: 3D Printing/Additive Manufacturing, Blockchain, Cyber Security, Internet of Things, Artificial Intelligence, Robotics Process Automation, Social & Mobile, Big Data Analytics, Cloud Computing and Augmented Reality/ Virtual Reality, through Resource Centres across the Nation by Hub-n-Spoke Model. 16.52 Lakh candidates have signed up on the FutureSkills PRIME portal: [www.futureskillsprime.in](http://www.futureskillsprime.in). Around 6.65 lakh candidates have enrolled for Foundation/Deep-Skilling/ Bridge and non-aligned courses out of which, around 2.78 lakh candidates have completed the courses. 10838 Government officials from Central/State Government Offices/Departments/ PSUs trained across the Nation and 2257 Trainers trained under Training of Trainer Programme”. The details of IT Professionals/Government Officials/Students trained by C-DAC Resource Centres in Government Officials Training Programme, Training of Trainer Programme and Bridge Course is as below:



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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**e-Hastakshar / e-Sign:** As part of the Government’s Digital India Initiative, C-DAC has developed e-Hastakshar – C-DAC’s eSign service that facilitates instant signing of documents online/offline based on Aadhaar authentication to government and private agencies. C-DAC utilizes service of Unique Identification Authority of India (UIDAI) for on-line authentication and Aadhaar eKYC service. e-Hastakshar service supports both One Time Password (OTP)/ToTP and Biometric (Fingerprint/IRIS/Face) based modes of authentication for leveraging eKYC service of UIDAI. Facial based authentication on eSign 2.1 APK has been released on November 2023.

More than 13.47 Cr e-Signs have been offered by C-DAC till December 2023. More than 205 Government agencies are leveraging C-DAC’s esign service on production level. Several key new agencies Ministry of Agriculture and Farmer Welfare, Financial Intelligence Unit-India, Directorate of IT Maharashtra with existing key agencies Employees' Provident Fund Organisation, National Informatics Centre, Centre for eGovernance, Karnataka are leveraging eSign on production level.

C-DAC has commissioned and made operational a new DC for e-Hastakshar operations with a capacity of 10 Lakh eSign per day.

eSigns offered by C-DAC	
July 2016 to December 2023	October – December 2023
13.47 Cr	1.45 Cr



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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**Cyber GYAN-** MeitY has entrusted C-DAC Noida to implement the Project titled "Cyber Security Scenario based Self-Paced Learning Training Facility (Cyber GYAN) for SC, ST and Economically Weaker Section Under Graduate and Post Graduate students of Government Colleges of 8 North-Eastern States and 4 other States (Uttar Pradesh, Haryana, Gujrat and Kerala) of India.

The Project envisages to develop skilled manpower in the highly needed domain of cyber security to safeguard the critical infrastructure from cyber-attacks.

Number of Students Enrolled		
State	Feb 2022 to December 2023	October to December 2023
Uttar Pradesh	358	283
Assam	132	3
Arunachal Pradesh	72	26
Haryana	31	29
Meghalaya	26	0
Tripura	25	0
Mizoram	12	0
Sikkim	6	2
Nagaland	1	0
Grand Total	663	343





# MAJOR PROJECT PERFORMANCE/ STATISTICS

**eSanjeevani:** eSanjeevani is the National Telemedicine Service of Ministry of Health & Family Welfare (MoHFW), Government of India. Owing to its widespread and speedy adoption, eSanjeevani has evolved into the world’s largest documented telemedicine implementation in the primary healthcare. eSanjeevani – National Telemedicine Service is testimony to the fact that digital health has come of age in India. eSanjeevani has revolutionised primary healthcare in India by bringing health services to the masses in rural areas and isolated communities. In eSanjeevani network nationally, 1,35,736 Health and Wellness Centres (HWCs) have been registered as spokes and 14,648 hubs have been operationalized. eSanjeevani boasts over 2,02,920 doctors, specialists, and health workers as telemedicine practitioners, operating in all states and union territories of India. It serves approximately 4,25,000 patients daily, with the capacity to handle up to 1 million patients per day. eSanjeevani is operational in all States/UTs across India. However, In Delhi, eSanjeevaniAB-HWC is not available.

eSanjeevani Usage Report				
	Nov 2019 to December 2023		October 2023 - December 2023	
	Total Tele-Consultations	Registered Doctors	Total Tele-Consultations	Registered Doctors
eSanjeevani	194,058,867	59,765	30,160,666	5,267
eSanjeevaniAB - HWC	183,150,613	51,404	29,900,607	3,964
eSanjeevaniOPD	10,908,254	8,361	2,60,059	1,303



**PROGRESS PULSE:**  
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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**Hospital Management System- e-Sushrut:** e-Sushrut- C-DAC's Hospital Management Information System (HMIS) is a major step towards adapting technology to improve healthcare. HMIS incorporates an integrated computerized clinical information system for improved hospital administration and patient health care. It is integrated with ABDM Mile Stones and provides an accurate, electronically stored medical record of the patient. A data warehouse of such records can be utilized for statistical requirements and for research. The real time HMIS streamlines the treatment flow of patients and simultaneously empowering workforce to perform to their peak ability, in an optimized and efficient manner.

e-Sushrut Usage Report		
	No. of Patients Visited	
	Till Dec 2023	Oct 2023- Dec 2023
e-Sushrut for AIIMS (15 No's)	1,90,99,471	21,75,122
e-Sushrut PAN Railways HMIS	2,83,44,911	40,78,672
SAIL BSL e-Sushrut HMIS	4,51,940	1,25,577
HMIS-NHM UP	1,08,81,313	28,32,777
HMIS- DGME UP	67,79,663	21,86,025
Punjab	3,12,33,894	50,06,616
Telangana	1,56,37,930	40,41,186
Odisha	3,64,51,242	37,86,899
NIMS HMIS Hyderabad	37,26,729	1,91,538
HMIS Maharashtra	1,05,83,226	14,36,989
IGIMS Patna	2,41,056	2,41,056



**PROGRESS  
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# MAJOR PROJECT PERFORMANCE/ STATISTICS

**Blood Management System- eRaktKosh:** e-RaktKosh is a comprehensive IT solution to connect, digitize and streamline the workflow of blood banks. It has on-boarded more than 4000 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		
	Year 2017 to December 2023	October 2023 - December 2023
Total Blood Bank Registered	4,085	57
Total Govt Blood Bank Registered	1,244	3
No of Active Blood Banks	3,020	3,143
No of Camp Conducted	98,885	12,375
No of Donor Registered	52,51,000	7,05,760

**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 medicines, 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. Currently, 19 States, 6 UTs, 05 National Programs under MoHFW and 03 other state institutions are using this application. It is also implemented for the Ministry of Defence (DGAFMS) for Army, Navy, Airforce and other wings of defence.



**PROGRESS PULSE:**  
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# MAJOR PROJECT PERFORMANCE/ STATISTICS

Total Number of Drugs issued through DVDMS			
Sl.no	State Name	January 2023 to December 2023	October 2023 to December 2023
		Qty. (in Crore)	Qty. (in Crore)
1	Rajasthan	886.54	241.20
2	Himachal Pradesh	67.11	17.52
3	Uttar Pradesh	742.75	185.62
4	Jharkhand	40.98	8.50
5	Puducherry	20.90	3.90
6	Lakshadweep	1.90	1.10
7	Andhra Pradesh	314.79	80.90
8	Telangana	214.40	46.03
9	Assam	14.90	3.90
10	Punjab	130.80	39.02
11	Uttarakhand	23.95	7.50
12	Bihar	335.18	82.50
13	MP	402.55	98.35
14	Gujarat	370.55	105.23
15	J&K	52.41	11.99
16	Maharashtra	192.36	44.20
17	DMER Maharashtra	11.74	3.20
18	Manipur	2.56	0.48
19	Meghalaya	1.15	0.39
20	Mizoram	14.68	2.45
21	Arunachal Pradesh	27.26	4.56
22	Nagaland	8.60	1.58
23	CTD -MoHFW	129.42	39.25
24	FPLMIS -MoHFW	43.33	13.50
25	MSO -MoHFW	158.1	48.32
26	CMSS Delhi	165.55	38.20



**PROGRESS  
PULSE:**  
A PERFORMANCE  
DASHBOARD

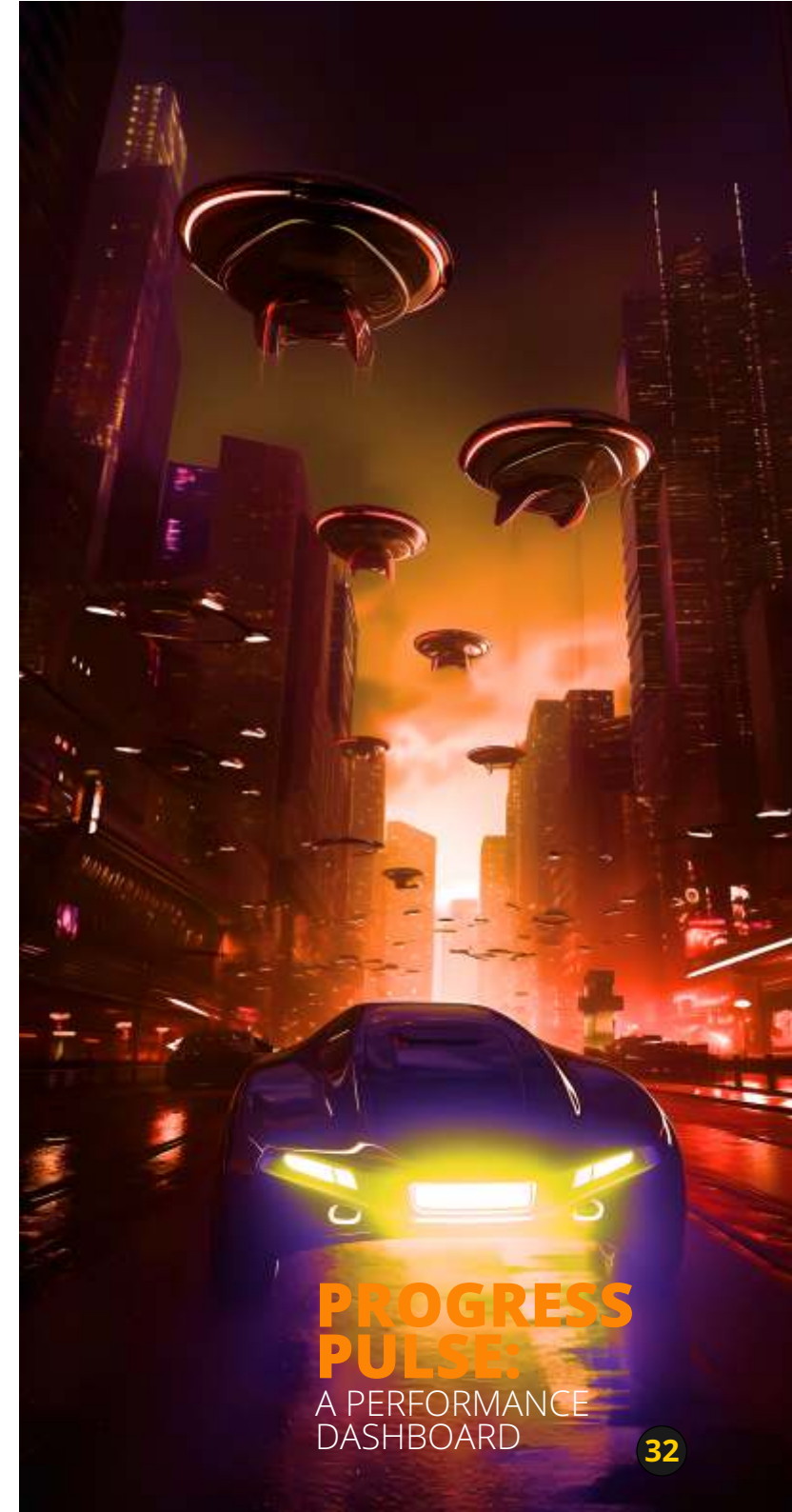


# MAJOR PROJECT PERFORMANCE/ STATISTICS

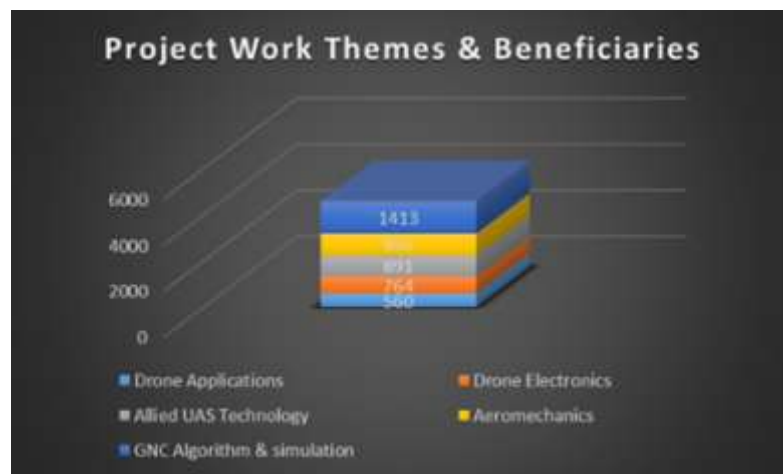
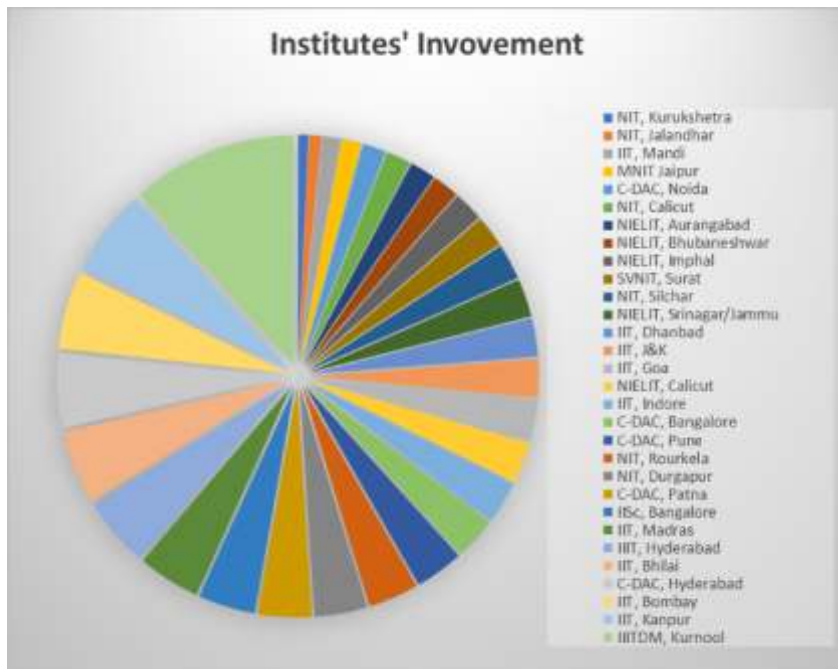
**Swayaan:** Capacity Building for Human Resource Development in Unmanned Aircraft System: This project is led by C-DAC Hyderabad and IIITDM Kurnool as the Programme Management Unit (PMU) to develop a UAS/Drone Ecosystem across the Nation. The project is implemented in a hub-and-spoke model through 30 institutions including IISc Bangalore, IITs, IIITs, NITs, CDAC, and NIELIT Centres. Under the project, the overall target is to train 45,000+ candidates through various Formal, Non-Formal programs and Research Program such as MTech in UAS/Drones, Minor degree/Retrofitting courses in UAS/Drones, PG Diploma Program, Short term Skilling Courses, Innovation Challenge, Bootcamps, POC, National Workshops, International Conference, Open Online Courses, IPR (Paper and Patents) creation, etc. over a period of 5 Years.

As on date, overall, 170 activities have been conducted across India as part of various Academic programs, Research & innovation activities, Trainings/ Workshops, and other Knowledge sharing initiatives to train 4,584 participants thereby expediting the spirit of the Nation towards becoming a Global Drone Hub by 2030.

Program Name	Activity: 2022 -2023			Participants: 2022 -2023		
	Sept 2022 - October 2023	November 2023 – December 2023	Total	Sept 2022 - October 2023	November 2023 – December 2023	Total
FDP	9	0	9	236	0	236
Workshop	5	0	5	411	0	411
Bootcamp	68	11	79	2679	384	3063
PG-Diploma	2	0	2	10	0	10
POC	40	0	40	177	0	177
M-Tech	1	0	1	11	0	11
Minor Degree	3	0	3	66	0	66
Retrofitting Electives	21	0	21	582	0	582
IPR-Paper	6	2	8	17	6	23
IPR-Patent	2	0	2	5	0	5
<b>Total</b>	<b>157</b>	<b>13</b>	<b>170</b>	<b>4194</b>	<b>390</b>	<b>4584</b>

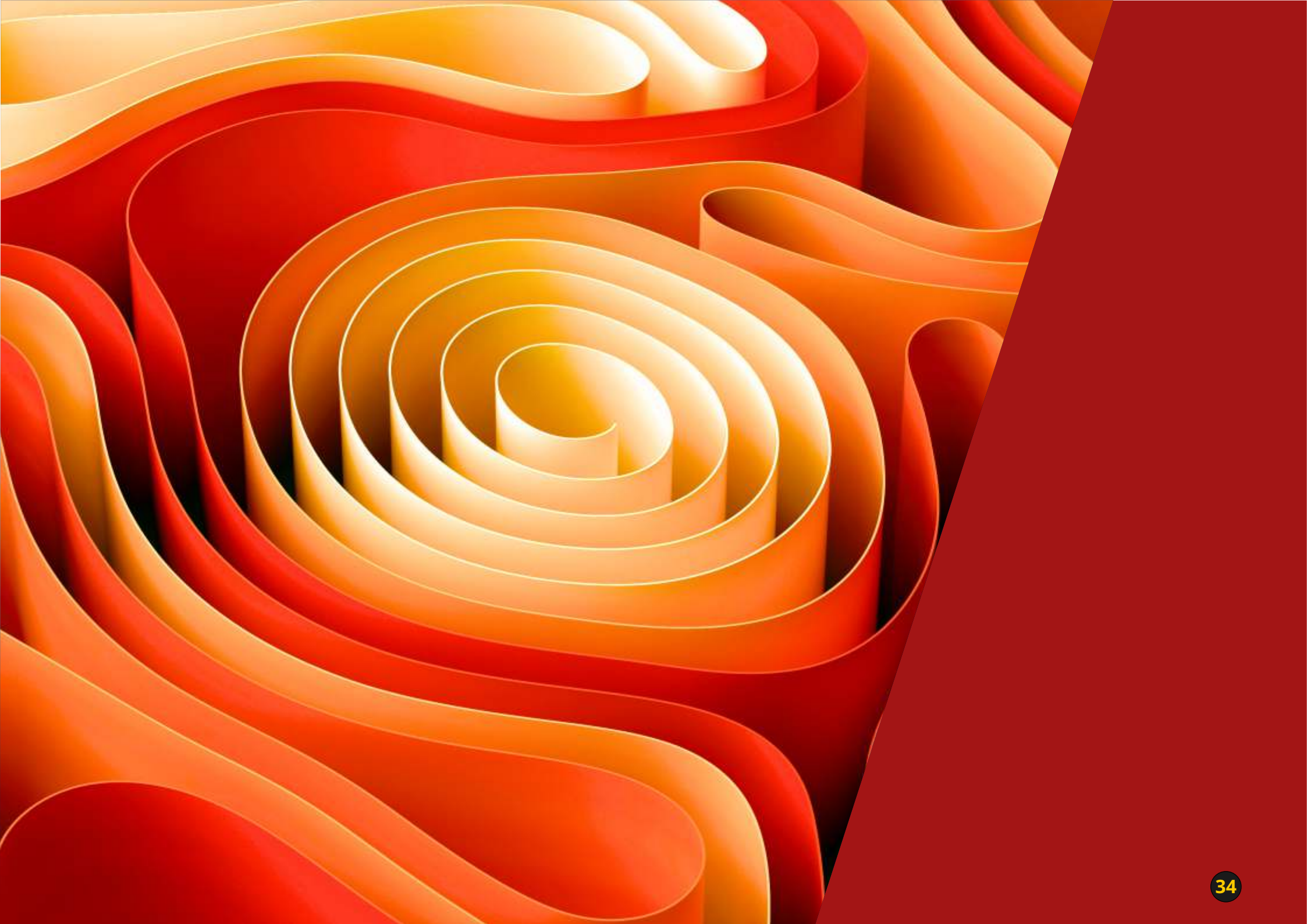


**PROGRESS PULSE:**  
A PERFORMANCE DASHBOARD



**PROGRESS PULSE:**  
A PERFORMANCE DASHBOARD







# TECH ROLLOUTS

SYSTEM/ PRODUCT/ SERVICES LAUNCH/ RELEASE



# TECH ROLLOUTS

## LAUNCH OF IOT DEVICE SECURITY EVALUATION HANDBOOK



Launch of IoT Device Security Evaluation Handbook on December 08, 2023 by Shri. Bhuvnesh Kumar IAS, Additional Secretary, MeitY, Government of India at Bangalore in the august presence of Ms. Tulika Pandey, Group Coordinator & Scientist G, Cyber Security R&D Group, MeitY, Shri. Magesh E, Director General, C-DAC, Dr. S D Sudarsan, Executive Director, C-DAC Bangalore and Ms. P Lakshmi Eswari, Director, C-DAC Hyderabad.

# TECH ROLLOUTS

## LAUNCH OF C-DAC'S INDIGENOUSLY DEVELOPED TECHNOLOGIES



Launch of three Indigenously developed technologies 1) CMOS sensor based Smart Vision Sensor (IVIS) for Industrial Applications. 2) Thermal Camera for Intelligent Transportation System (TvITS) and 3) Online Sucro Crystal Imaging System (OSIS) from C-DAC Thiruvananthapuram on October 12, 2023 at Traffic Infra Tech Expo and Smart Mobility Conference 2023, New Delhi. by Shri S Krishnan, Secretary, Ministry of Electronics and Information Technology (MeitY), in the presence of Smt. Sunita Verma, Group Coordinator (R&D in Electronics &IT), MeitY, and Smt. Mangala Chandran, Editor-in chief, Traffic Infra-Tech Expo, and senior officials of Government & Industry.

# TECH ROLLOUTS

LAUNCH OF NEW SYSTEM BALE IDENTIFICATION AND TRACEABILITY SYSTEM (BITS)



Launch of a new system called the Bale Identification and Traceability System (BITS), developed by C-DAC Mumbai which uses blockchain technology to track and verify cotton bales as they move through the supply chain on World Cotton Day, October 7, 2023. Ms. Rachna Shah, Secretary of Textiles for the Government of India, unveiled the BITS in Delhi. The launch event was attended by dignitaries from the Ministry of Textiles, including Textile Commissioner Ms. Roop Rashi, Chairman of TEXPROCIL Shri. Sunil Patwari, and CMD of CCI Shri. Lalit Kumar Gupta. Experts from the cotton industry, textiles, and agriculture were also present.



# TECH ROLLOUTS

LAUNCH OF IOS VERSION OF MENTAL HEALTH AND NORMALCY AUGMENTATION SYSTEM (MANAS) APP



Launch of the iOS version of Mental Health and Normalcy Augmentation System (MANAS) APP In the “Mental Health and Normalcy Augmentation System (MANAS) Codeathon and Symposium 2023”, organised by C-DAC Bengaluru under the aegis of Office of the Principal Scientific Adviser (PSA), GOI during 6th and 7th October 2023 at VRR Astoria Resort, Bengaluru in observance of World Mental Health Month.





# INTERNATIONAL OUTREACH



# INTERNATIONAL OUTREACH



As a part of India – Solomon Islands Centre of Excellence in IT (IS-CEIT) which was setup by C-DAC Delhi at SINU Panatina Campus, Honiara organized a workshop on Data Analysis in MS Excel with AI tools during October 26 - 27, 2023 at the Solomon Island National University (SINU), Kukum Campus.



Under the Indian Technical and Economic Cooperation (ITEC) program sponsored by the Ministry of External Affairs, Government of India, C-DAC Mohali conducted two intensive training programmes in Data Science & Cyber Security and Digital Health during November and December 2023. More than 70 international participants from more than 30 countries attended the same.









# EVENTS





## Global Partnership on Artificial Intelligence

The 2023 GPAI Summit, held at Bharat Mandapam in New Delhi from December 12th to 14th, brought together government representatives, AI experts, and multilateral organizations from 29 GPAI member countries. Stepping up as a facilitator and convener, MeitY orchestrated a series of impactful side events during the summit. From celebrating innovative startups with the AI Gamechangers Awards to fueling discussions on healthcare, accessibility, skilling, governance, data, and global collaboration through expos, symposiums, workshops, and roundtables, MeitY ensured AI's multifaceted potential was explored and debated.

C-DAC, Pune was the coordinating centre for the Expo and nine C-DAC centres participated in the event. Thirty innovative AI based solutions were showcased.





## Workshop on Quantum Accelerated Computing



Two-day "Workshop on Quantum Accelerated Computing" as part of the collaborative project "Quantum Accelerator" was organised by C-DAC Pune to foster knowledge sharing, innovation, and collaboration within the rapidly evolving field of quantum computing.

The event was graced by distinguished guests and speakers, including Dr. Vijay P. Bhatkar, Chairman TAC, C-DAC, as the Chief Guest, and Shri. E Magesh, Director General, C-DAC, Shri. Vivek Khaneja, Executive Director, C-DAC, Noida, and Dr. S. D. Sudarshan, Executive Director, C-DAC, Bengaluru, as Guests of Honour. Col. A.K. Nath (retd.), Executive Director of C-DAC, Pune, was the workshop convener. 45 participants from diverse academic institutions and industry backgrounds participated in the same.





## Visit of Shri. S. Krishnan (IAS) Hon'ble Secretary, MeitY Government of India



Inauguration of  
eSign's  
(e-Hastakshar)  
Data center  
at C-DAC Pune

C-DAC Pune has commissioned and made operational a new DC for e-Hastakshar operations with a capacity of 10 Lakh eSign per day which has inaugurated by Shri. S. Krishnan (IAS) Hon'ble Secretary, MeitY Government of India on November 25, 2023 at CIP C-DAC Pune.





## Unveiling of Quantum Technology Lab



On November 25, 2023, C-DAC Pune officially opened its Quantum Technology Lab, marking a significant milestone in India's quantum technology journey. Shri. S. Krishnan, Honorable Secretary of MeitY, presided over the inauguration ceremony, accompanied by esteemed guests including Shri. Ethirajan Magesh, Director General of C-DAC, and Col. Asheet Nath (Retd.), Executive Director of Corporate Strategy & C-DAC, Pune.





## Visit of Secretary, MeitY to CoE at C-DAC Noida



A CoE has been established at C-DAC, Noida under the project "Establishment of CoE for Products Based on Li-ion Cells (Post-Cell)". The CoE is a collaborative initiative between C-DAC, the India Cellular & Electronics Association (ICEA), the Ministry of Electronics and Information Technology (MeitY), Government of India, and the Department of IT & Electronics, Government of Uttar Pradesh.

Shri. S. Krishnan, Secretary, MeitY, visited the CoE's state-of-the-art facilities on October 12, 2023 at C-DAC Noida, including the Analog & Digital RF lab, PCB Prototype Lab, Safety lab, EMI/EMC lab, Environmental lab for reliability testing, and 3D Print Lab.



## 3rd India Quantum Technology Conclave 2023

C-DAC served as the official technology partner for the 3rd ASSOCHAM India Quantum Technology Conclave 2023, which took place in New Delhi on October 05, 2023.

Dr. Jitendra Singh, India's Minister of State for Science and Technology, Prime Minister's Office, Personnel, Public Grievances and Pensions, Department of Atomic Energy, and Department of Space, was the Chief Guest at the 3rd ASSOCHAM India Quantum Technology Conclave 2023. In his keynote address, he highlighted the significant progress India has made in various fields of science and technology in recent years. He also encouraged industries to collaborate and innovate within the quantum technology ecosystem, which has the potential to revolutionize India's technology sector.





## Unveiling of Cyber Forensics R&D Roadmap of India



Shri. Bhuvnesh Kumar IAS, Additional Secretary, MeitY, Government of India unveiled the "Cyber Forensics R&D Roadmap" in "Stratagem" a multi-stakeholder consultation program, organised by the Ministry of Electronics & Information Technology (MeitY) with C-DAC Thiruvananthapuram on November 16, 2023. Ms Tulika Pandey, Scientist-G & Group Coordinator, Cyber Security R&D Group, MeitY; Dr Pradeep Saji, Director, State FSL Kerala, Shri Bhadrans V K, Technical Director at Alibi Global Pvt Ltd, Shri Magesh E., Director General of C-DAC, Shri Kalai Selvan A, Director, C-DAC Thiruvananthapuram, and Ms Dija S, Scientist-F, C-DAC Thiruvananthapuram were the other dignitaries present.



# BACKEND SQUAD



## CISO DESK

ISO 27001 is being implemented in all centres of C-DAC through office of Chief Information Security Officer (CISO). As a part of same, various activities were conducted.

Globally October month is celebrated as Cyber Security Awareness Month (CSAM), and as part of this activity with the theme "Cyber Safety Starts with YOU," the CISO office conducted a series of awareness sessions on various security issues including Malware Detection and Threat Intelligence, Social Engineering Attacks and Security Measures, Threat hunting and Modelling for proactive cyber defense, Navigating Data Privacy and Compliance in the Digital Age, The Digital Personal Data Protection Act, 2023 and The Role of VPN in Cybersecurity.

A workshop focusing on the formulation of tools, technologies, and standards for building a "Mission Safe and Secure Cyberspace for the nation" took place on December 22, 2023, at C-DAC Thiruvananthapuram (Technopark Campus). Additionally, a two-day training session on SOC, CDACSIEM, and DARPAN was conducted on December 20-21, 2023. The training garnered substantial participation from NISOs, as well as system and network administration teams from various C-DAC centers. It also attracted the attention of relevant development teams interested in the development of SIEM/SOAR and the integration of existing security solutions.

## APPOINTMENT OF INFORMATION OFFICERS

It was decided during 46th Management Board meeting of C-DAC held in November 2023 that towards managing the software/hardware development purchases and their effective utilization, implementation of best practices and procedures, enhance productivity etc., information Officers need be in place across centres. Once officers are nominated by respective centres, the roles/responsibilities and operational aspects would be detailed by Corporate R&D for approval by DG.



Training on SIEM and SOC at CDAC Thiruvananthapuram

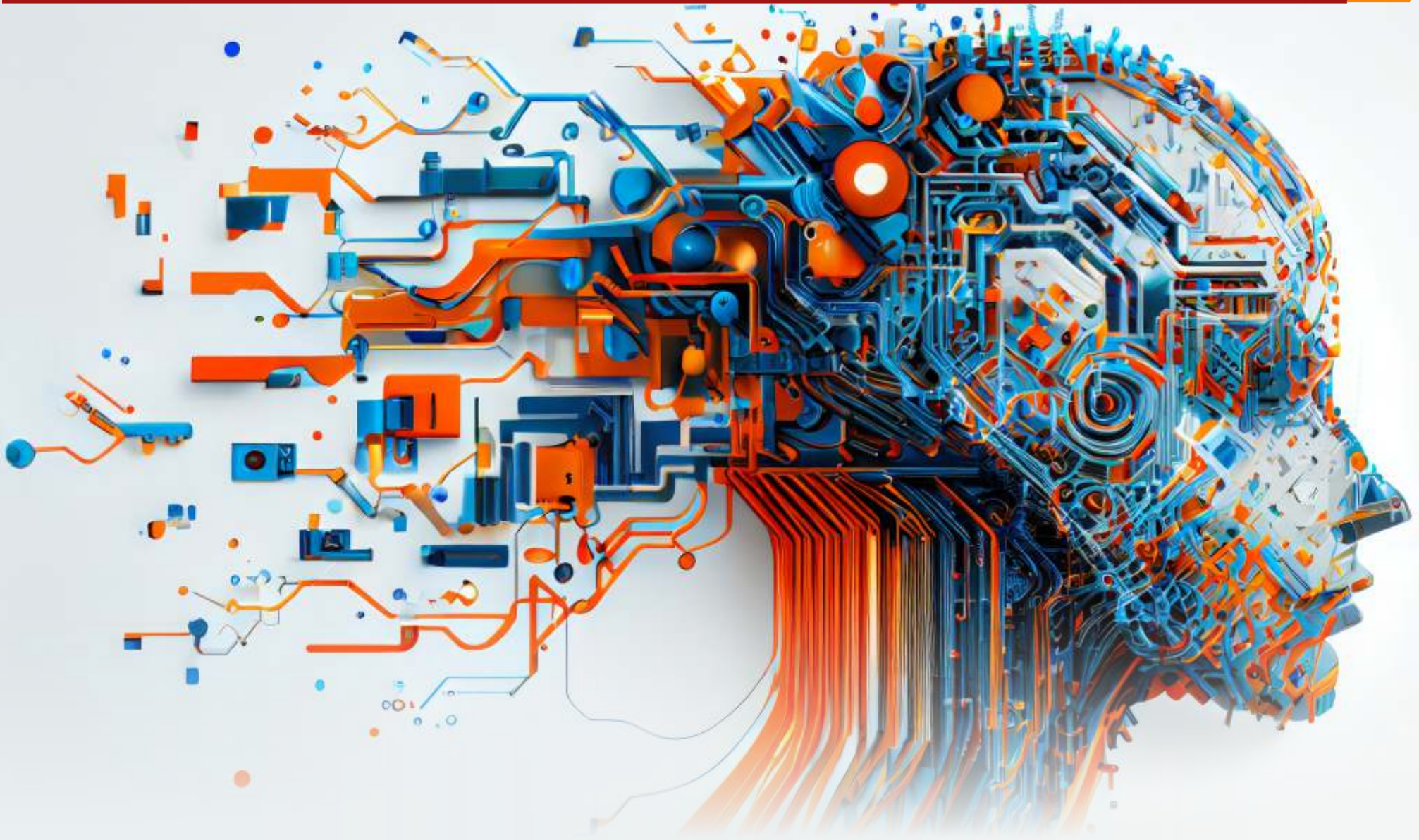






# INSPIRING INSIGHTS ON NEW FRONTIERS







# AI – FROM YESTERDAY TO TOMORROW

**Dr.M.Sasikumar**  
**Executive Director**  
**C-DAC, Mumbai**

We can paraphrase the famous lines about water, like this today. It is the most popular buzzword today across the world, and is exciting and worrying many in its current avatars. From the coining of the term AI in 1956 in the Dartmouth conference in US, AI has come a long way, with many ups and downs along the way. In India, AI made its presence felt in the 80s, with the KBCS project funded by the UNDP – United Nations Development Programme. Incidentally, I started my journey in AI, with this project. Across a few institutes, work was initiated in areas such as machine translation, parallel logic programming, expert systems, pattern recognition, and so on. NCST, which later became CDAC's Mumbai centre, worked actively in parallel logic programming, expert systems, practical applications in resource scheduling, and education as well as machine translation. Vidwan was the first (and to the best of my knowledge the only) expert system shell to be fully made in India and made available to users to build applications. A regular conference series KBCS was also initiated as part of this journey. The conference saw a lot of Indian and international participation, and was instrumental in bringing the prestigious international conference IJCAI to India in 2007. It was held in Hyderabad with a good gathering of AI stalwarts from across the world. I remember the keynote address from CMU on robotic soccer, among many exciting things.

The AI of those days were mostly symbolic in nature. The generic component was a set of search techniques – generally clubbed under the name of heuristic search – which grew from simple hill climbing to genetic algorithms and bioinspired algorithms, and knowledge representation which talked about capturing the variety of knowledge to be found in modelling intelligent processing.







There was also severe shortage of electronic data for training and testing. With movements towards digitalisation, exemplified by India's digital India initiative, most industries are making use of computers in some way or other. From supermarkets and travel, to hospitals and schools, all kinds of data became available in digital form. This led to evolution of fields like data mining, which dominated the AI field for a decade or so. Usual statistical techniques as well as state of the art machine learning algorithms began to be applied to facilitate decision making. Data soon became the new oil! Neural networks showed its head quite early – almost 40 years ago. Some early criticism that a neuron cannot even compute an XOR, and hence computational power is very limited, got levelled against NN, and slowed down its growth. While algorithms like backpropagation helped to counter this allegation, the poor computing power at disposal pulled down the popularisation of neural networks in main stream. A lot of network architectures like Hopfield networks, Kohonen networks, etc were proposed for various tasks.

### **From yesterday to today**

Over the last two decades, the IT landscape changed substantially. With massive adoption of computers in all walks of life, exemplified by our own Digital India movement, electronic data was becoming available in huge measures. Computer power and capacity grew almost by a million fold. These gave a new boost to the field of machine learning, particularly the statistics (or data) driven learning. Neural networks picked up momentum as multi-level networks could be conceptualised and used. Sophisticated training algorithms came on the horizon, and the new AI was born.

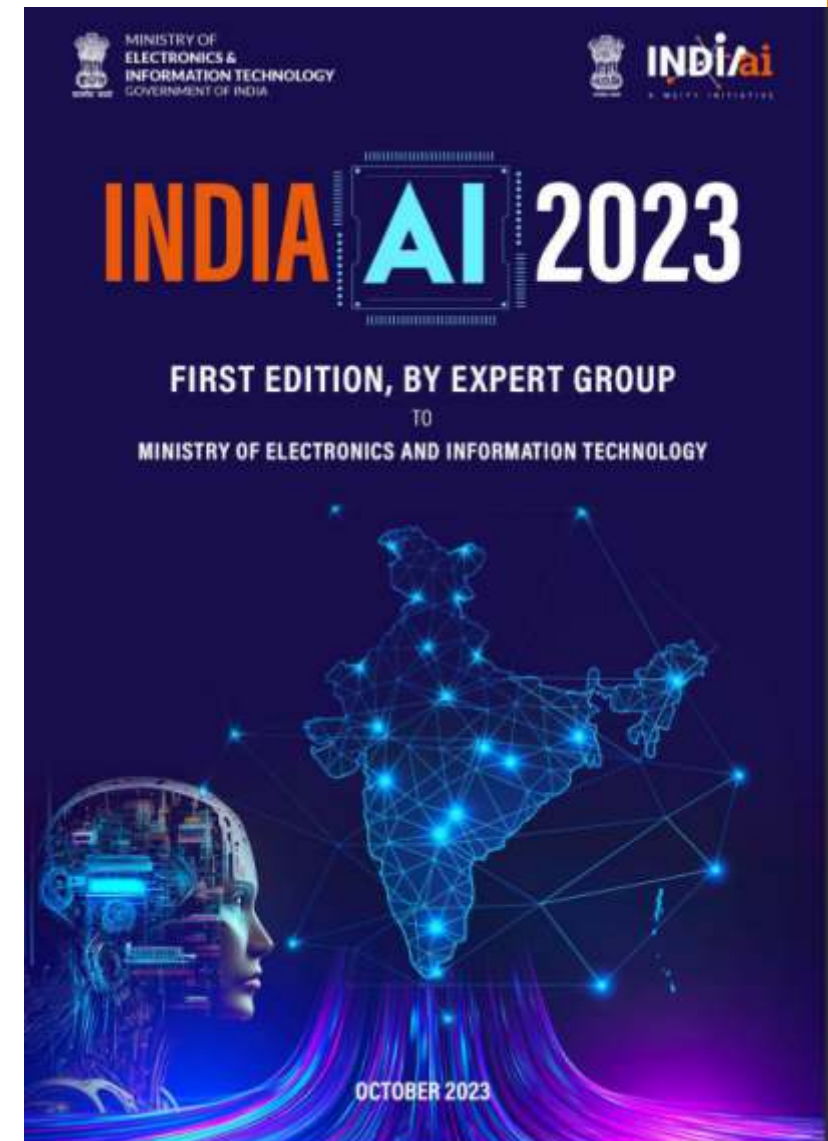


From traditional multiple layered networks (DNN), we have moved on to Recurrent Neural Networks (RNN), Convolutional neural networks (CNN), adversarial networks, and so on. These extended the NN repertoire with ability to handle time sequences and richer dependencies. Significant results were obtained, particularly in image processing (e.g., face recognition). The advent of generative models brought a phenomenal change to the landscape, and is still driving the field today.

From simple GANs (generative adversarial networks), the field moved to transformers to improve the performance through an attention mechanism. OpenAI's introduction of the ChatGPT family is now the talk of the town! For once, we saw systems synthesising output fluently and reasonably accurately. The successive generations of ChatGPT (and its competitors like BARD) are reporting improvements at lightening speed adding multimodality, improved fidelity, and so on.

The deep learning induced technologies mentioned above are being applied to varied fields with interesting results. And we are still to understand these technologies, their capabilities and limitations. With some hype and some reality, the expectations are going through the roof, and driving every organisation and country to stay deeply connected with AI. Our own IndiaAI initiative of Meity, as well as the initiatives from other ministries underlie the importance that India is placing on AI. Meity brought out a report recently outlining the roadmap for larger penetration of AI in India.

Generative techniques are now being applied to videos, images, etc in addition to text. Tasks like machine translation and summarisation are also being attempted using these techniques.





## Applications of AI

From the early days, AI techniques have been tried on many different applications. Classic areas have been natural language processing and computer vision, where traditional algorithmic approaches were simply not feasible.

The variety of languages widely used and spoken across the world have triggered the need for automatic language processing. Most challenging among these have been automatic language translation (MT). Over the years, a range of techniques have been thrown at it, and books written on the challenges involved. Sub problems like POS tagging, morphological analysis and synthesis, anaphora resolution, phrase attachment, parsing to decode the structure, and so on have emerged and flourished over the years. In some of these, commendable results have been achieved.

In India also MT attracted a lot of attention. IIT Kanpur, NCST Bombay, IIIT Hyderabad and CDAC Pune were strong players in the space. CDAC's solution is still being used in our rajya sabha for translation of proceedings. Over time, rule based formalisms, tag based formalism, example based translation, statistical translation, and neural translation have been adopted to this task. While the results are improving with each new technology, many challenges still remain – particularly, if grammar rules are not adhered to, or if figurative writing is present. Another challenge is when mixed language text is involved. Complementing written language, recognition of spoken text (ASR) and converting text to speech are also important problems in this area. We have viable solutions in the speech area today, as the technology is maturing. Computer vision has evolved from pattern recognition, to face recognition, complex analytics over video recordings,



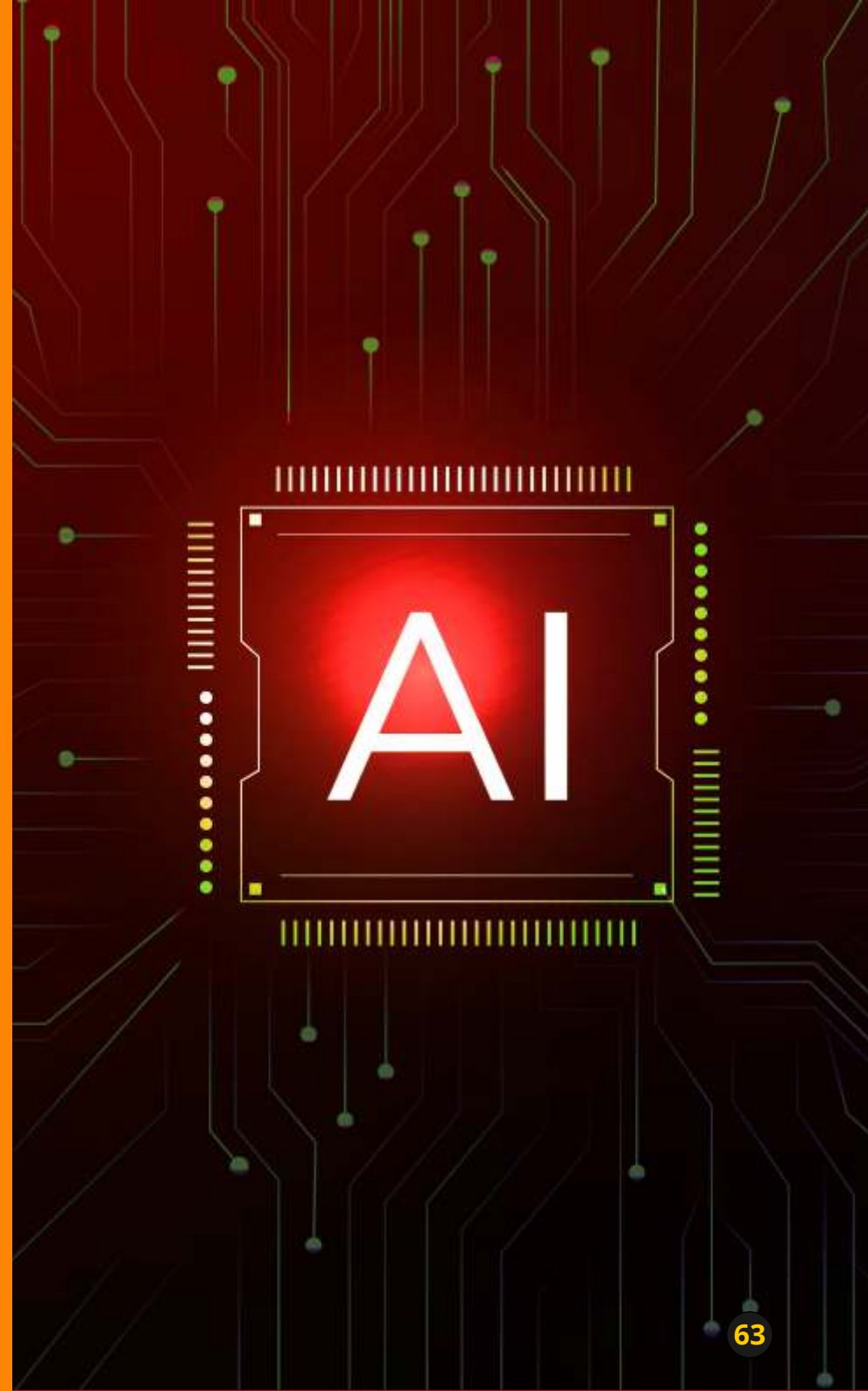


Healthcare and agriculture have received a lot of attention recently from AI techniques. Diagnosis of diseases by analysing various instruments (retina, scan images, etc for example) is a topic much being explored by many using deep learning systems. From weed and pest control, to yield improvement, produce quality assessment and soil management are challenging problems for agriculture. CDAC has significant contributions in the field of produce quality assessment using AI.

Problems in transportation, resource and time scheduling, resource optimisation, programming, etc have also been targeted for AI.

### **Challenges**

The lightening pace of developments in deep learning driven AI is also bringing its own challenges. Since a lot of data used for training, are behavioural and fine grained data and hence personal in nature, there are concerns of privacy being raised against rampant use of such data. Technologies like ChatGPT are being used by people of all walks of life, to produce reports and solve assignments, and so on. It is important to understand that these generative techniques have their limits. There is active investigation of hallucinations, where the predictive models may produce output that is not known to be true. A user is unable to distinguish such information from others, and may believe both. The fast growing concern of fake news is a much bigger, scarier version of this phenomenon. How does one check the authenticity of the output from a generative system?



The lack of explainability in deep learning systems is another concern, particularly in critical domains like healthcare, plant management, etc. The emerging field of XAI (explainable AI) looks into developing explanations from current models. Another concern is the narrow focus of the systems today. A diabetic diagnosis system knows nothing of other diseases or aspects of human physiology, and hence continues to lack “graceful degradation at the boundaries”. AGI, artificial general intelligence, is aiming to build systems where the intelligence broader, and hence able to handle multiple tasks intelligently.

AI is going through a challenging period – there are breath taking developments taking place as we speak, and also concerns of where the field is going on the other side. The developments are certainly useful to design innovative solutions to problems in healthcare, agriculture, security, environment, climate change, and so on and should be explored, keeping the concerns in mind.



# ChatGPT Conversations: An Alarming New-Born Challenge for Cyber Security Researchers

**Dr. Dittin Andrews**  
**Scientist E (Cyber Security Group)**  
**C-DAC Thiruvananthapuram**

In the dynamic landscape of artificial intelligence, ChatGPT (Chat Generative Pre-trained Transformer) stands as a testament to the rapid evolution of conversational AI. Developed by OpenAI, ChatGPT has become an integral part of our digital interactions, offering users a seamless and human-like conversational experience. As this innovative technology becomes more pervasive, its transformative potential is accompanied by a set of intricate cyber security challenges that demand a comprehensive examination. The advent of ChatGPT marks a paradigm shift in how we engage with machines.

ChatGPT is an amazing chatbot that can generate natural and engaging conversations. It can also assist us with various tasks, such as customer service, content creation, and more. While these models bring unprecedented capabilities in natural language understanding and generation, they also pose new challenges for cybersecurity professionals. While there has been huge excitement on the potential use cases of Generative AI, we have to be aware of the potential threats that ChatGPT can pose to our data and privacy, and take precautions to safeguard them.

ChatGPT can expose our sensitive information, create malicious code, spread misinformation, and introduce bias and discrimination. These issues can have serious consequences for individuals and organizations. The primary security concerns that ChatGPT may cause are attempted to be explained in this article along with how they may affect our stakeholders and ourselves. Additionally, this article will offer a few tips on how to utilize ChatGPT in a secure manner as well as how to make sure that everyone can trust and be ethical in our conversations. The aim is to reduce the risks associated with ChatGPT while enjoying its benefits.



AI – from  
yesterday  
to tomorrow



### **Data Privacy Concerns:**

In the realm of generative AI, data privacy issues loom large as these systems are designed to create content by learning patterns from wider datasets. The very nature of generative AI models, such as ChatGPT, involves processing and understanding substantial amounts of diverse information, including potentially sensitive details shared in conversations. The challenge arises from the need to strike a balance between the model's capacity to generate contextually relevant responses. Simultaneously, it is imperative to safeguard user privacy in the process. Issues may stem from inadvertent disclosure of personal or confidential information during the model's training process or in the responses it generates. Robust data privacy measures, including encryption, anonymization, and careful data retention policies, are essential to mitigate these concerns. Furthermore, as generative AI continues to advance, it becomes crucial to establish clear guidelines and regulations. This is necessary to ensure responsible use, transparency, and user trust, addressing the evolving landscape of data privacy in the context of these powerful and innovative AI models.

In this complex game, where privacy and innovation are the team captains, striking the right balance is crucial. In order to ensure that ChatGPT enhances our conversations and prioritizes user privacy and security, developers and organizations must take continuous steps. They need to seamlessly review their data privacy procedures, ensuring they align with the highest standards. Additionally, ongoing efforts to improve these procedures are crucial to uphold the commitment to user privacy and security. As we explore the complex world of data privacy issues surrounding ChatGPT, it becomes evident that protecting this aspect is not just necessary for compliance. It is also a commitment to creating a safe and reliable conversational environment for users everywhere.





### **Malicious Use of ChatGPT:**

ChatGPT, created to enhance user experiences, has the potential for malicious exploitation. Concerns include the generation of deceptive content and the risk of spreading misinformation, leading to tangible consequences. Additionally, the model's adaptability makes it susceptible to phishing attacks, where it can craft convincing messages to trick users into revealing sensitive information. To tackle this challenge, developers need to continuously refine the model's training data, implement content moderation, and educate users on distinguishing authentic content from potential threats. Looking into the potential misuse of ChatGPT makes it clear that taking early actions, staying watchful, and working together with developers, organizations, and users are crucial for using this technology responsibly.

### **Adversarial Attacks:**

Adversarial attacks aim to trick the model by making small changes to the input text, causing it to provide incorrect or harmful responses. Regularly adjusting the model's settings and training it on diverse datasets helps enhance its resilience against such attacks. Tactics like adversarial training, which exposes the model to intentionally challenging situations, further fortify its defences. Real-time monitoring during deployment helps identify unusual inputs, and incorporating adaptive mechanisms enables the model to learn and stay ahead of evolving adversarial techniques. Raising awareness among users and developers is crucial to recognize and address potential security breaches.

### **Bias and Ethical Concerns:**

The presence of biases in ChatGPT's responses poses a major challenge, rooted in the biases within the training data. The model may unknowingly produce responses that mirror or amplify societal prejudices, reinforcing stereotypes or marginalizing certain



groups. To tackle this, developers need to use diverse training data, consistently assess the model's responses for biases, and provide transparency in decision-making. User feedback plays a crucial role in identifying and rectifying biases in real-world situations. Open dialogue on ChatGPT's ethical implications fosters community engagement and accountability in shaping the technology's ethical framework. Cooperation among developers, users, and regulatory agencies is essential to establish an ethical framework that ensures accountability, transparency, and justice in ChatGPT's interactions.

### **User Authentication and Authorization:**

As ChatGPT integrates into diverse applications, prioritizing user authentication and authorization is paramount. Multi-factor authentication adds an extra layer of security by requiring various forms of identification, while Role-Based Access Controls (RBAC) ensure users only access relevant features. Regularly updating user access permissions aligns with changes in personnel or business requirements. Secure communication channels using encryption protocols, protect data during conversations, ensuring confidentiality and integrity. Balancing user convenience with stringent security measures is essential for creating a seamless yet secure conversational experience with ChatGPT.

### **Regulatory Compliance:**

Organizations adopting ChatGPT can enhance responsible implementation by navigating regulatory compliance challenges proactively, establishing a foundation of trust between stakeholders. Adapting to the changing landscape of global and regional data protection and privacy legislation requires a flexible approach. The General Data Protection Regulation (GDPR), a key international framework, mandates transparent data practices, user consent, and mechanisms for data portability and





erasure. In the Indian context, the Information Technology Act of 2000 and its amendments play a vital role, governing electronic transactions and data security. Organizations in India leveraging ChatGPT must align with these regulations, and the Digital Personal Data Protection (DPDP) Act of 2023 will further shape privacy and data protection in India. This legislation is expected to impose stringent obligations on data controllers and processors, necessitating a vigilant approach from organizations to modify their procedures and ensure compliance. The proactive measures include robust data protection, privacy impact assessments, and staying informed about legislative changes, fostering a culture of compliance, and maintaining user trust.

### **Conclusion:**

In the world of ChatGPT and conversational AI, balancing the excitement of innovation with the need for security is crucial. As ChatGPT and Generative AI become more popular, they bring along challenges. These challenges include keeping user data safe, preventing misuse, and addressing biases. It's like a game where privacy and innovation are the team captains, and finding the right balance is the goal.

For ChatGPT to be helpful to everyone, developers and organizations should regularly check and improve how they manage user data. This includes following rules, using strong security measures, and being careful about possible risks. Working together is crucial in protecting against harmful use, dealing with tricky attacks, handling biases, and making sure everyone follows the rules.

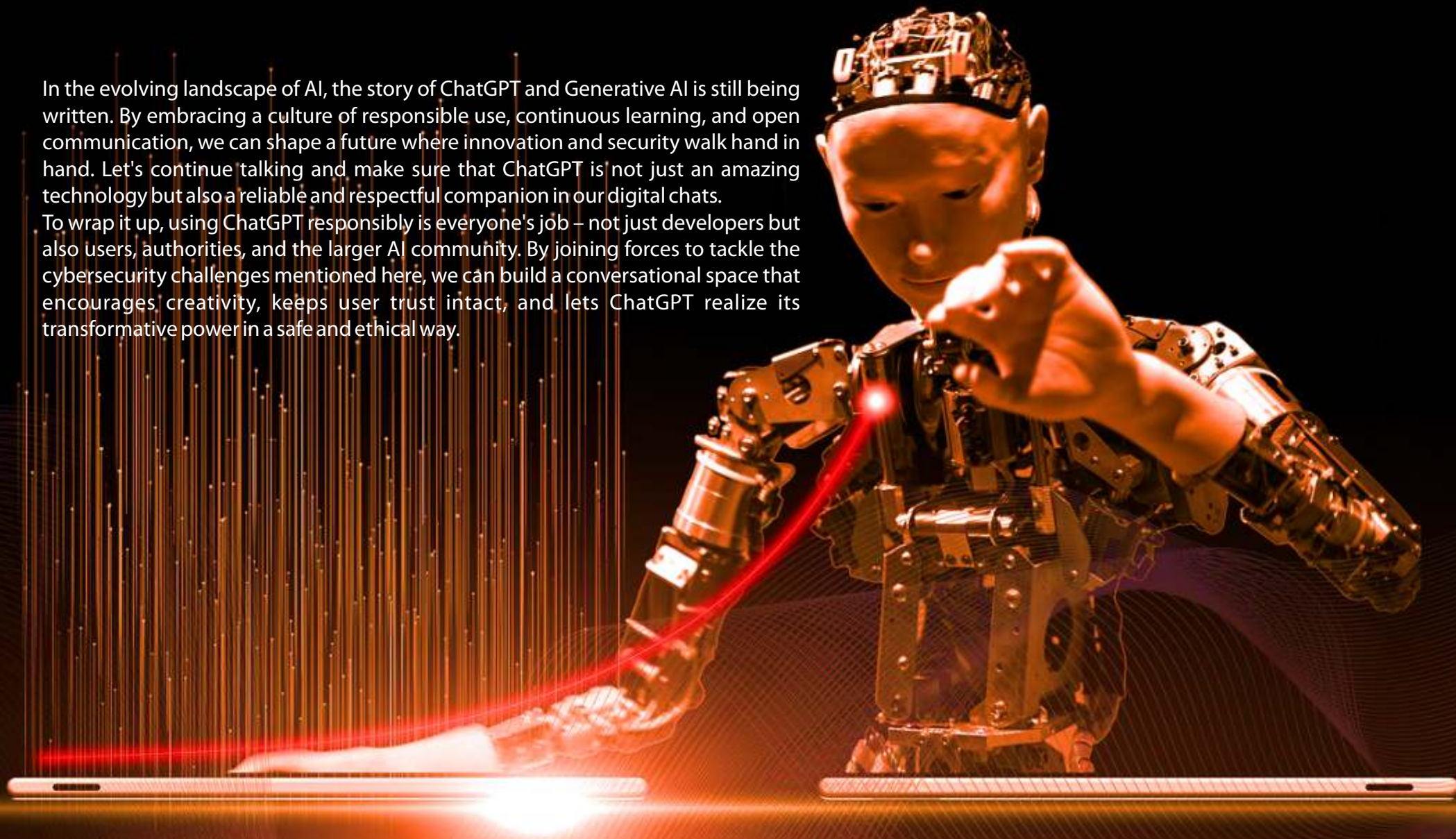
In this digital journey with ChatGPT, it's important to remember that responsible use goes beyond rules and regulations. It's about making sure conversations stay respectful, unbiased, and secure for everyone involved. As we enjoy the convenience of ChatGPT, being mindful of potential challenges is essential. Developers and users working together, sharing feedback, and staying informed contribute to a safer and more trustworthy conversational experience.





In the evolving landscape of AI, the story of ChatGPT and Generative AI is still being written. By embracing a culture of responsible use, continuous learning, and open communication, we can shape a future where innovation and security walk hand in hand. Let's continue talking and make sure that ChatGPT is not just an amazing technology but also a reliable and respectful companion in our digital chats.

To wrap it up, using ChatGPT responsibly is everyone's job – not just developers but also users, authorities, and the larger AI community. By joining forces to tackle the cybersecurity challenges mentioned here, we can build a conversational space that encourages creativity, keeps user trust intact, and lets ChatGPT realize its transformative power in a safe and ethical way.









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CENTRE FOR DEVELOPMENT OF ADVANCED COMPUTING

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