Annual Report 2019-20

सी-डॉट
C-DOT

Centre for Development of Telematics

(CMMI Level 5 organization)

VISION

To become the world class telecom technology development centre.

MISSION

To design and develop state-of-the-art technologies, products and solutions.
To meet the telecom needs of India particularly of national importance in strategic sectors and rural areas.

CONTENT

C-DOT Management 02

03 Overview

Accomplishments and Activities 04

09 Organizational Processes and Practices

Intellectual Property Rights 10

13 Transfer of Technology

Knowledge Management 15

20 Awards Received

Events 22

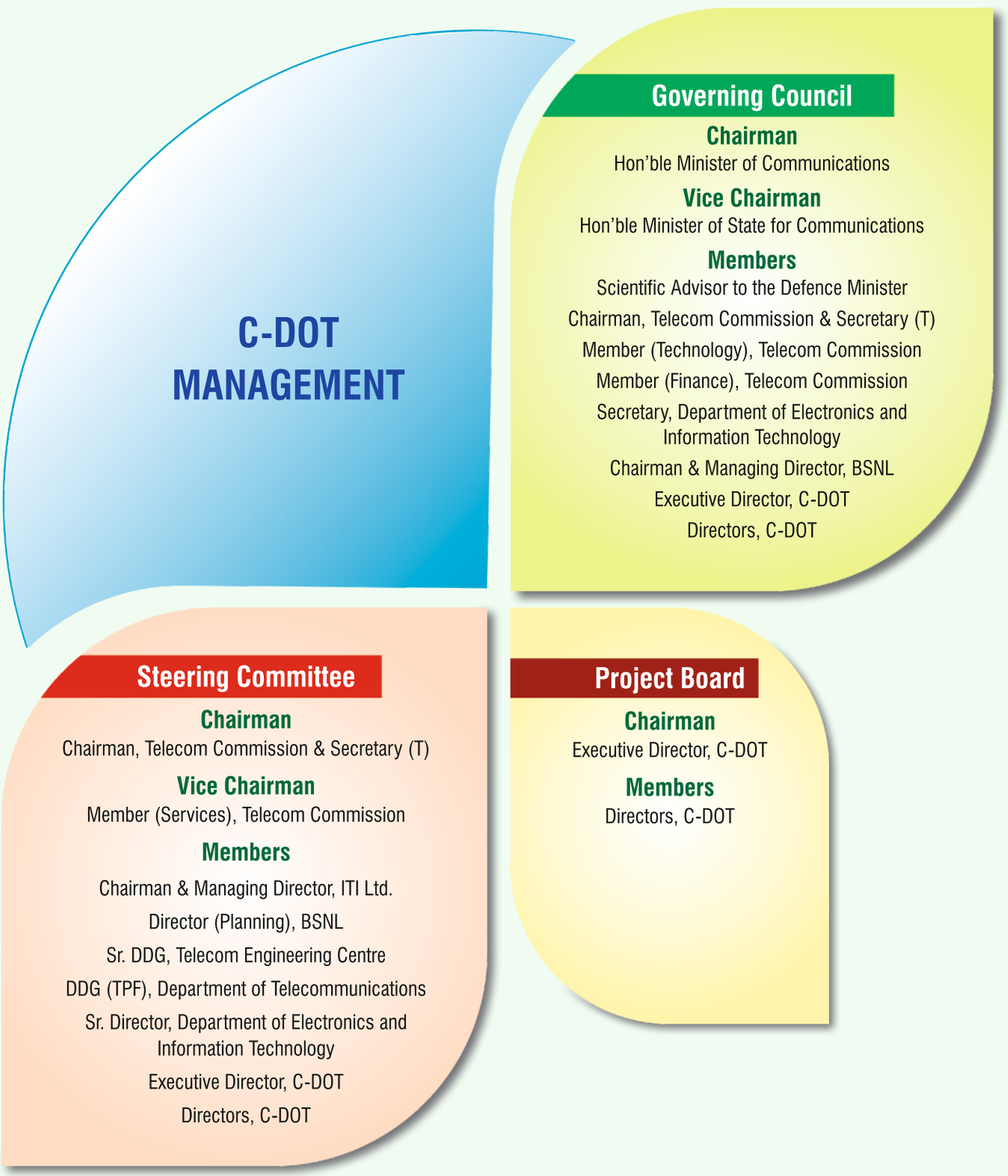
30 HR Initiatives

Swachhta Action Plan 31

32 Promotion of Hindi

Vigilance Awareness Initiatives 35

36 Financial Statements


C-DOT MANAGEMENT
Governing Council
Chairman
Hon'ble Minister of Communications
Vice Chairman
Hon'ble Minister of State for Communications
Members
Scientific Advisor to the Defence Minister
Chairman, Telecom Commission & Secretary (T)
Member (Technology), Telecom Commission
Member (Finance), Telecom Commission
Secretary, Department of Electronics and Information Technology
Chairman & Managing Director, BSNL
Executive Director, C-DOT
Directors, C-DOT
Steering Committee
Chairman
Chairman, Telecom Commission & Secretary (T)
Vice Chairman
Member (Services), Telecom Commission
Members
Chairman & Managing Director, ITI Ltd.
Director (Planning), BSNL
Sr. DDG, Telecom Engineering Centre
DDG (TPF), Department of Telecommunications
Sr. Director, Department of Electronics and Information Technology
Executive Director, C-DOT
Directors, C-DOT
Project Board
Chairman
Executive Director, C-DOT
Members
Directors, C-DOT

Overview

Centre for Development of Telematics (C-DOT), established in 1984 as an autonomous R&D centre of the Department Of Telecommunications, Ministry of Communications, Govt. of India has been widely known for its monumental role in ushering in the indigenous Telecom revolution in the nation.

With its world class research labs equipped with the state-of-the-art infrastructure and a pool of the brightest engineers from the top institutes of the nation, C-DOT has been strongly committed to fulfilling the overarching objectives of national development through its targeted research initiatives addressing the specific connectivity needs of our diverse country. C-DOT's technologies aim at augmenting the broadband infrastructure of the nation and addressing the typical requirements pertaining to rural, security and strategic applications. C-DOT's diverse product portfolio spanning a wide array of technologies that include switching & routing, optical communication, wireless communication, network security, advanced encryption techniques and Post-Quantum Cryptography based solutions, M2M/IOT, AI, 5G, network management and a host of other telecom software applications is a manifestation of its unrelenting desire to capture the unexplored dimensions of the vast telecom firmament.

C-DOT's passionate zeal to extend the connectivity to every nook and corner of the nation is well corroborated by its indigenously designed exchanges, popularly called RAX and MAX that are still propelling the rural networks with the persistent upgrades to facilitate the provisioning of the latest IP-based services in an economically viable and effective manner.

C-DOT's GPON (Gigabit Passive Optical Network) solution is fueling the backbone of BharatNet, the prestigious nationwide optical fibre based network connecting 2.5 lakh Panchayats in the nation with high speed broadband, thus realizing our Hon'ble PM's dream of “Digital Empowerment”. Recently launched C-DOT's XGSPON (10 G Symmetrical Passive Optical Network) is an effective solution to fulfil the rapidly increasing demands of high network speeds emanating from the new dimensions of user applications like IPTV, HD Video Streaming, Online Gaming and host of other cloud- based services that necessitate the seamless availability of high bandwidth.

C-DOT's indigenously designed and built Terabit Router is a testimony to our prowess in the field of switching and routing, wherein our switches, gateways and other network entities are slated to play an increasingly pivotal role in the recent initiatives of Govt. of India viz. “Smart Cities” and “Digital India”. C-DOT GPON was also awarded with Golden Peacock award 2018 (instituted by the Institute of Directors, New Delhi) under Innovative Product/Service category.

C-DOT has successfully developed indigenous, state-of-the-art 80 channel Dense Wavelength Division Multiplexing (DWDM) system with an aggregate capacity of 8000 Gbps (8 Terabits per second). It has been ideally suited to cater to ever-increasing demand of bandwidth in the core of telecommunication network with support of 100 Gbps per channel.

C-DOT's BBWT (Broad Band Wireless Terminal) is especially suited to ensure wireless connectivity to even the most inhospitable and inaccessible terrains of India with a sharp focus on the utilization of the Green sources of energy in the power deficient areas.

Recently launched CiSTB will prove to be a boon to the dissatisfied customers who cannot change their Cable TV operator in view of the recurring costs of setting and installing the physical infrastructure afresh. Based on a portable smart card like a mobile SIM, this solution will revolutionize the experience of the Cable TV operators by offering them a high degree of choice, ease and convenience without having to replace the once installed STB.

C-DOT is a proud member of the oneM2M initiative whereby its M2M and IoT applications have successfully proved its interoperability across a global platform. C-DOT was also conferred with the National Intellectual Property Award 2016 in the category of “Top Organisation/Institution for Patents”.

C-DOT, today has emerged as one stop destination for the latest indigenous telecom technologies and innovative solutions, thus propelling the engines of indigenous manufacturing based on its ToT (Transfer of Technology) Model. C-DOT is also poised to play a vital role in catalyzing the evolution of indigenous manufacturing ecosystem as envisioned under the landmark mission, “Make in India”.

Accomplishments and Activities

C-DOT Achievements for FY 2019-20

Overview of C-DOT Activities

C-DOT is engaged in the research and development of state-of-the-art Telecom R&D activities as well as in the field implementation of its developed technologies. The progress on major technologies under development, field deployment, etc. is briefly summarized in the section given below.

1. Physical Performance

- **Central Equipment Identity Register (CEIR)** – Successfully launched web portal in Maharashtra and Delhi for tracing of stolen mobiles.
- **C-DOT Video Conference Solution** – Successfully demonstrated to the Hon'ble MoC and is now being used by DOT, TEC and C-DOT for their official meetings.
- C-DOT designed an application COVID19 Quarantined Alert System (CQAS) to alert the concerned authorities on unauthorized movement of quarantined person from the designated area.
- C-DOT developed an Aarogya Setu IVRS back-end application to get current location and subscriber details of the helpline user, who gives missed call to the Aarogya Setu IVRS number.
- Proof-of-concept for Cyber Space Monitoring (CCSM) Framework for CERT-Telecom completed.
- CMC DR readiness in C-DOT Bengaluru. Most of the central LEAs and some of the state police on-boarded in CMS network.
- **5G and LTE** – Development for 5G ongoing for cloud RAN, NB-IoT (Narrow Band-IoT) and Massive MIMO. MoU signed with academic institutions for research and development in 5G. Trial of LTE in MTNL network.
- **Optical technology** – 100G DWDM system in ring network installed and commissioned in MTNL Delhi network. XGS-PON (chassis based) offered to TEC and next generation-PON-2 offered for validation. TOT completed for new variants of GPON technology e.g. ONT-17A, ONT-24 and 8 port line card, etc.
- **M2M and STB** – M2M network extended lab trial with applications ongoing. Readiness of commercial CAS STB for trial in the field.
- **Green Power Supply** – System integration for 5KW completed, testing in-progress.
- **NGN Technology** – C-DOT MAX technology migration to NGN completed.
- **Wi-Fi Technology** – C-DOT has installed C-Sat-Fi solution for the Aspiration Village scenario using the VSAT link at Harish Tal and TalliSethi village of Bhimtal Block of Nainital district for POC/trial.
- **C-DOT Samvad (Messaging System)** – Under deployment in Intelligence Bureau (IB). PoC successfully completed with Indian Navy, proposal submitted for commercial deployment. PoC ongoing with NTRO and Indian army
- Proof-of-concept (PoC) of Wayfinder App for phase-1 successfully completed at C-DOT Delhi Campus with 2-D navigation & A-R (Augmented-Reality). App handed over to UN, Geneva for E-building.

The progress made in major technology programs, is briefly discussed as follows:

1.1 Security related projects

- **Centralized Monitoring System (CMS)** for lawful interception and monitoring - a National Roll-out Project put into operations. CMC DR IT Infrastructure– CMC DC build along with IT infrastructure at Delhi and CMC DR DC build along with IT infrastructure at Bengaluru are operational. Most of the central LEAs and some of the state police on-boarded in CMS network. Implementation of Grey market analysis completed for all 21 RMCs. Acceptance testing completed at MP, Karnataka, Mumbai, Delhi, UP (West) and Rajasthan.

- **Secure and Dedicated Communication Network (SDCN)** – SDCN commissioned in MTNL Delhi Network. SDCN expansion for defence is completed with completion of FAT for VoIP CPE, aggregators and router, field Support is ongoing. Equipment was delivered by C-DOT for deployment at 10 more sites to expand the Secure Dedicated Communication Network beyond National Capital Region.

- **Internet Lawful Interception Monitoring System (ISP)** – During the year, implementation of ISP gateway completed at Verizona, Hyderabad and BSNL, Ernakulum; PCI handover completed for 8 sites in Delhi – TCI, Telstra, BSNL, MTNL, BSNL Noida, Airtel Noida, Reliance Okhla and Tikona.

- **Centre of Excellence for Lawful Interception (CoE)** – Development of advance technology to fulfil requirements of LEAs. Significant progress has been made in OSINT capable for online and offline data collection, big data storage, analysis for social networking websites (You Tube, Twitter, Facebook, LinkedIn etc.). Object and Face Recognition - enhanced and pilot tried with features – gender, age estimation, emotions, etc. at C-DOT Delhi campus, and commercial proposal submitted to NCRTC. PoC of Wayfinder for phase-1 successfully completed at C-DOT Delhi campus with 2-D navigation & A-R (Augmented-Reality). App was handed over to UN, Geneva for E-building. Order for Samvad has been received from the office of Intelligence Bureau and an order from Navy is expected to be received, very soon. C-DOT Video Conference System demonstrated successfully to the Hon'ble MoC and is now being used by DOT, TEC and C-DOT for their official meetings. Quantum-safe cryptography – FPGA-based PQC encryptor offered for validation. Network steganography demonstrated in VoIP Phone to various potential users.

1.2. Optical technology related projects

- **DWDM-based 100G Optical Transport Network (OTN) system** – C-DOT's 100G DWDM system was installed at 3 locations in a ring configuration in MTNL Delhi and 12 locations in linear configuration in Railtel.

- **Packet Optical Transport Platform (POTP) 1.6T** – System integration completed and offered for internal validation.

- **TWDM-PON** – The development of XGS-PON and NG-PON2 products completed. XGS-PON (chassis based) offered to TEC; XGS-PON (Mini OLT) and NGPON-2 offered for validation; hardware development completed for TWDM-PON integrated OLT Chassis.

1.3. Switching and Routing Technology

- **High Speed Routing System** – Software development and testing on the reference hardware has been completed. Proposal for trial submitted to MTNL. The trial is planned with 40 Gbps interface, progressively upgraded to 100 Gbps.

- **LAN, MAN Enterprise and Data Centre Segment** – L3 switch implementation for 24-port and architecture design for 48-port L2/L3 integrated switch completed. Validation completed for medium capacity ToR switch. Software porting on reference hardware in-progress for high capacity ToR and Spine switch.

- **Customized Router for DRDO-ANURAG** – The final testing of the system based on C-DOT designed processor ongoing. PCB fabrication for the system based on indigenous multicore processor in-progress. Detailed design of the software for this system has been completed, implementation in-progress.

- **Router Enhancements, Trial and Roll-out** – Trial and deployment of C-DOT MTBR is ongoing in BSNL & MTNL network.

1.4. Solar based Green Power Supply

- **High Capacity Solar Power Supply System** – 75W, 125W and 250W systems ready for manufacturing. ToT process also initiated for 2KW System. System integration for 5KW completed and testing in-progress.

1.5. Satellite based technology

- **Satellite hub baseband system -** Carrier-grade hub baseband system installed in DEAL, Dehradun. Integration and testing of the system with customer's module completed at DEAL, Dehradun. The integrated system shifted to field site (Army headquarter, Meerut). System installed and working in simplex mode. Field trial and system Integration testing with satellite ongoing.

- **Digital Video Broadcasting (DVB) S2 Hub Baseband System** – Requirement analysis, system architecture design

and interfaces finalized. Customer concurrence awaited. Algorithm selection and simulation completed. Software algorithm development ongoing.

1.6 Telecom Services & Applications

- **M2M Communication** – One M2M applications – Smart Living, Smart Traffic Manager and Fire Alert System successfully integrated and demonstrated at C-DOT Delhi Campus. Design & development ongoing for CSE platform software. Development of Management Client (TR069) completed and development for Light Weight M2M (LWM2M) in-progress.

- **CiSTB** – Development and testing for interoperable set top box for Cable and satellite and over the top set top box (OTT) has been completed. Field trial done for Cable STB and C-DOT interoperable Basic CAS for IMCL Mumbai. C-DOT CAS and DTH STB trial taken up in Doordarshan network.

1.7. Wireless Technologies

- **LTE Enhancements, Customization and Trial** – C-DOT has developed a converged core network solution which enables delivery of a common set of services to all subscribers irrespective of the access technology they use for connecting to the network. The solution integrates 4G mobile, WiFi, fixed line and Passive Optical Network (PON) access networks into the converged core network solution. The solution is installed in MTNL for conducting field trials at two locations.

- **5G Technology Development** – C-DOT signed up MoUs with 6 academic institutions for promoting research and development in the area of 5G. A joint proposal was put up jointly by C-DOT and MTNL for conducting 5G trials at two locations.

1.8. Field Implementation of Major Projects

- **NGN** – C-DOT has already completed pan-India migration of its MAX DSS technology network of approximately 1700 large exchanges to Next Generation Voice-over-IP network for BSNL in 2019.

- **NMS -** system in-operation in the field.

- C-DOT Wi-Fi technology – C-DOT's C-Sat-Fi solution for Aspirational Villages in Harish Tal and Talli Sethi villages of Bhim Tal block of Nainital district in Uttarakand along with BSNL and along with BBNL C-DOT had completed the field trial at Gokulpur and Bir Chandra Nagar Gram Panchayat in TRIPURA. C-DOT has submitted the test report to Secretary Telecom and USOFA administrator.

- The services offered at aspirational village are as follows:
  - Voice services (VoIP over Wi-Fi) using low cost android mobile handset to complete village.
  - Provision to connect POTS (at ATA port) for the voice service at GP location using C-DOT Service Switch.
  - PBX service at Gram Panchayat building using WiDHWAN.
  - Affordable broadband services (Wi-Fi based services) for complete village by putting Wi-Fi in Mesh/ P2P configuration.
  - Retailing of broadband through PDO (coupons/ sachets).
  - Services like Chat and content (photo/files etc.) sharing, using SAMVAD.
  - Streaming of Local & relevant contents (region specific) using C-DOT Content Server and Manoranjan App.

- **GPON Variants** – TOT completed for new variants of GPON technology e.g.ONT-17A (to take care of the obsolescence of ONT-11), small ONT with WiFi (ONT-24) and 8-port GPON line card. Internal validation completed for modified SCM-1 (base-switch).

1.9. DOT projects

- **Cyber Security for CERT-Telecom** – C-DOT demonstrated a proof-of-concept (PoC) of an indigenously developed Cyber Space Monitoring Framework (CCSM) for Computer Emergency Response Team - Telecom (CERT-T). This framework enables monitoring of cyber traffic for identifying any potential malicious activities. Consequent upon the PoC, a detailed project report for a pan-India implementation of the CCSM has been submitted to the DoT.

- Central Equipment Identity Register - Stolen Device Reporting System web-portal has been launched in Maharashtra and Mumbai LSA, in September 2019 and in

Delhi in December 2019, by the Hon'ble MOC. Indian Counterfeited Device Restriction (ICDR) also implemented and made operational in January 2020 and running successfully.

- **COVID19 Quarantined Alert System (CQAS)** – C-DOT in coordination with DOT and TSPs, designed an application CQAS to collect current location of COVID quarantined persons and alert to the concerned offices, on their unauthorized movement from the designated area.

- **Aarogya Setu IVRS** – C-DOT developed an Aarogya Setu IVRS back-end application to get current location and subscriber details of the helpline user, who gives missed call to the Aarogya Setu IVRS number.

2. Technology Commercialization

A	MoUs and Project Agreements		
S. N.	**Strategic Partner**	**Executable Project**	**Purpose**
1.	Bharat Broadband Network Ltd.	National Optical Fiber Network (NOFN)	C-DOT's customized Network Management Solution (NMS) for PAN-India roll-out of NOFN
2.	The University Court of University of Edinburg	Visible Light Communication and Light Fidelity (Li-Fi)	Research & Development of Li-Fi technology
3.	Burundi Backbone System	Delivery and Implementation of C-DOT's advanced telecommunication solutions and services to manufacturers and customers	Collaborative working partnership
4.	Mahanagar Telephone Nigam Ltd.	IMS/EPC Converged Network Core; IP/MPLS Core Routers; 5G Trials	Synergizing efforts for the executable projects
5.	Space Application Centre, ISRO	Web/GIS System	Development of Web/GIS information system using high resolution satellite data
6.	Broadcast Engineering Consultants India Limited (BECIL) - MOU	Conditional Access System (CAS)	To work jointly and formalize an understanding on projects in the field of IT/ICT and communication systems for CAS
7.	National Disaster Management Authority	CAP- Compliant Disaster Early Warning Platform	To realize the full potential for smooth and speedy implementation of the platform at Pan India level

B	ToT Agreements with Manufacturers	
S. N.	**Strategic Partner**	**Executable Project**
1.	Bharat Electronics Ltd. (BEL), Kotdwara	Customised Edge Router for Strategic N/W – CRTR-210 and Enhanced L2 Switch
2.	Aggressive Electronics Manufacturing Services Pvt. Ltd.	Solar WiFi and High Speed Access Point (HSAP)
3.	Surbhi Satcom Pvt. Ltd.	Set Top Box for Cable/DTH segment

3. Campus Infrastructure

After years of efforts, self-sufficiency in meeting water requirements has been achieved by boring two tube wells after getting necessary statuary clearances. Delhi Jal Board water-connection for bulk water supply has been obtained as an additional source to meet water demand of the campus. Rain harvesting system and its periodic maintenance is another valuable resource for enriching ground water table at C-DOT Campus.

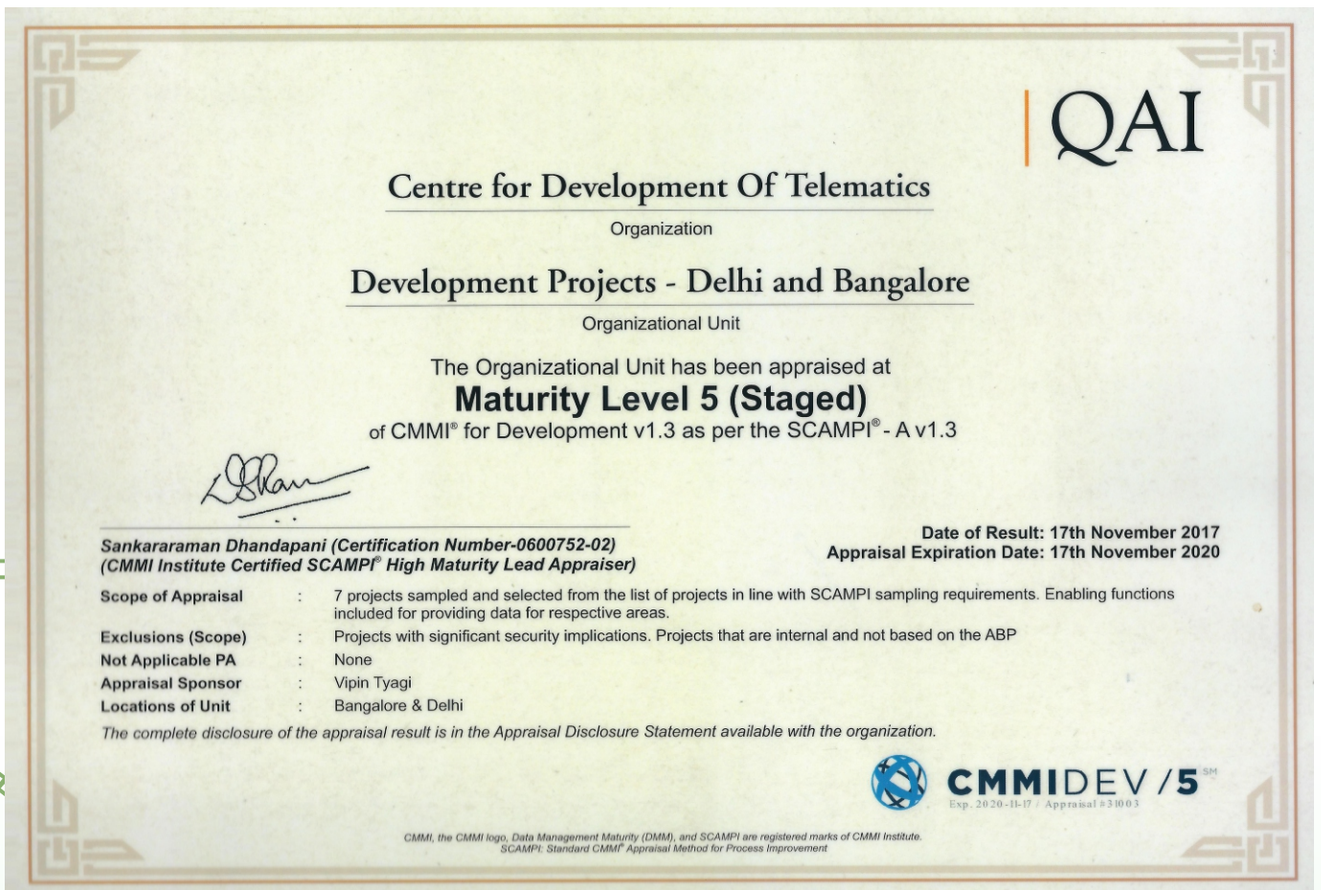
All mandatory approvals along with environmental clearance required for Housing and Hostel project have been obtained. C-DOT Board has approved a budget outlay of Rs. 5 crores to initiate the work. Architect submitted detailed PERT, estimate & draft tender for the project. Empowered committee has submitted its recommendation in November'2019 and accordingly tender for the work has been finalized. Indent of Rs. 5 Crores has been raised for further processing of the work. To achieve eco-friendly campus, 1.157 MWp Roof Top Solar (solar RTS) system has been installed at C-DOT campus in partnership with Central Electronic Ltd. (CEL). These systems have been installed for 600 KWp and 557KWp at Delhi and Bengaluru campuses respectively and operating successfully.

Organizational Processes and Practices

Organizational processes and practices for sustenance of CMMI Maturity Level 5

The organization was successfully appraised for CMMI Maturity Level 5 in 2014, for first time, and after expiry of validity period, successfully re-appraised in 2017, for its processes and practices related to hardware as well as software development projects.

During FY 2019-20, sustenance and further improvement of high maturity level practices are continuing and are being assessed through regular internal audits. Spot Checks by external assessor as preparations for a formal appraisal have been done. Findings are being resolved for a formal appraisal due in next financial year (SCAMPI-B appraisal in July and final SCAMPI-A appraisal at CMMI level 5 in September 2020).



QAI

Centre for Development Of Telematics

Organization

Development Projects - Delhi and Bangalore

Organizational Unit

The Organizational Unit has been appraised at

Maturity Level 5 (Staged)

of CMMI® for Development v1.3 as per the SCAMPI® - A v1.3

Sankararaman Dhandapani (Certification Number-0600752-02)
(CMMI Institute Certified SCAMPI® High Maturity Lead Appraiser)

Date of Result: 17th November 2017
Appraisal Expiration Date: 17th November 2020

Scope of Appraisal	:	7 projects sampled and selected from the list of projects in line with SCAMPI sampling requirements. Enabling functions included for providing data for respective areas.
Exclusions (Scope)	:	Projects with significant security implications. Projects that are internal and not based on the ABP
Not Applicable PA	:	None
Appraisal Sponsor	:	Vipin Tyagi
Locations of Unit	:	Bangalore & Delhi

The complete disclosure of the appraisal result is in the Appraisal Disclosure Statement available with the organization.

CMMIDEV/5℠
Exp. 2020-11-17 / Appraisal #31003

CMMI, the CMMI logo, Data Management Maturity (DMM), and SCAMPI are registered marks of CMMI Institute.
SCAMPI: Standard CMMI® Appraisal Method for Process Improvement

Intellectual Property Rights

Details of Patents Granted in FY 2019-20

S. N.	Title	Country
1.	Method and system of providing data in a preferred language of a user	India
2.	Interoperability of set top box through smart card	India
3.	A method and system to access multiple wireless network operator's subscription	India
4.	Dynamic channel selection in IEEE 802.11 networks	India
5.	An active infrastructure sharing system	India
6.	Resonance mitigation in RF high power amplifier enclosure	USA
7.	Interconnecting Optical Line Terminals (OLT) to optimize the usage of network resources	India
8.	GIS Based Centralized Fiber Fault Localization System	USA

Details of Patents Filed in FY 2019-20

S. N.	Title	Country
1.	System and method of enhancing number of concurrent VoIP calls over low bandwidth satellite link	India
2.	A method and a Mirrored Serial Interface (MSI) for transferring data	China, Nigeria, Canada UK, USA, Vietnam
3.	Device and method of synchronization in Quantum Key Distribution (QKD) system	India
4.	Dynamic channel selection in IEEE 802.11 networks	USA, Nigeria
5.	Event generation and management system	Malaysia, Vietnam, Indonesia
6.	Method, system and apparatus for multilingual and multimodal keyword search in a mix lingual speech corpus	USA

Designs Filed in India

S. N.	Title
1.	COSN (SET TOP BOX)
2.	ONT17 (OPTICAL MODEM)

Trademarks Registered in India

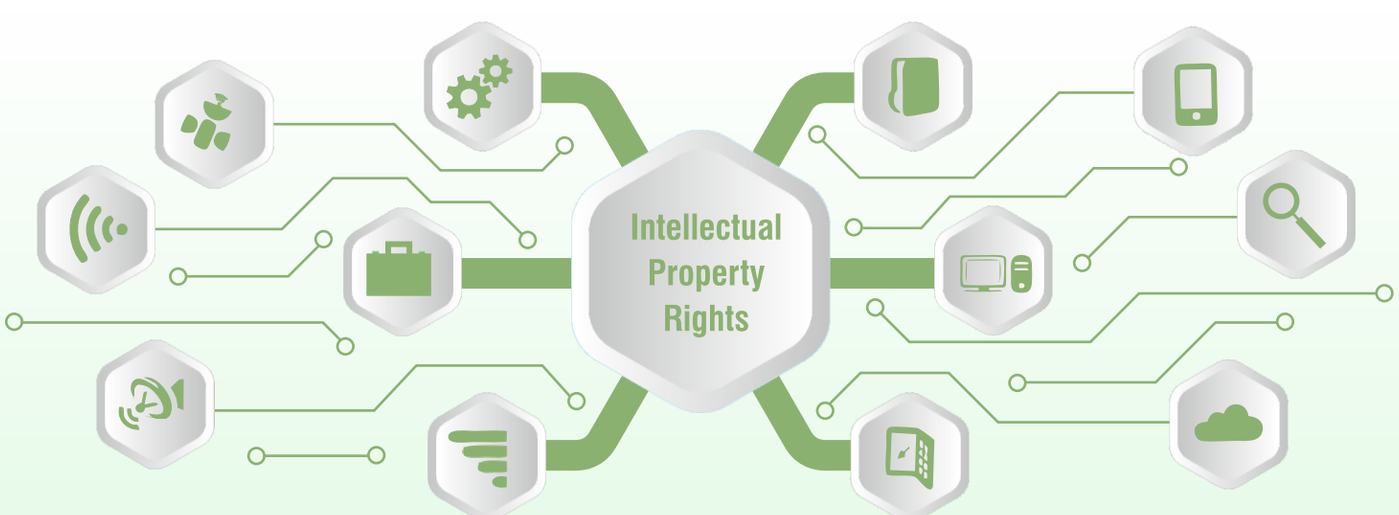
S. N.	Trademark Name/Logo
1.	C-TEC
2.	C-Sat-Fi
3.	Bamboo-Wi-Fi
4.	C-GEMS
5.	PDO
6.	CiSTB

Trademarks Filed in India

S. N.	Trademark Name/Logo
1.	C-Sat-Fi
2.	CiSTB
3.	C-CAS

Copyrights Filed in India

S. N.	Title
1.	Long-Term Evolution - Network management System (LTE-NMS)
2.	Location Management System
3.	North Bound Interface for GPON NMS
4.	Messenger
5.	Service Network Monitoring System
6.	Fiber Management System
7.	C-DOT Dashboard and Reports
8.	DVB-S2 Testbed Software
9.	Real Time Optimised DVB-S2 Forward link transmitter for DVB-RCS Hub system



Details of Paper Publications

S. N.	Title	Publication / Conference details
1.	Interference-Aware Co-channel Transmission over DTV Bands via partial frequency and time overlaps	International Communications Conference-2019, Shanghai, China, 20-24 May 2019
2.	Evaluation of functional splits in terms of optimal number of users served	International Conference on Advanced Computing and Communications (ADCOM 2019), IIIT Bangalore, 5-7 September 2019
3.	Link performance evaluation of Uplink Precoded Multiuser MIMO-NOMA system for 5G Communication Networks	International Conference on Advanced Computing and Communications (ADCOM 2019), IIIT Bangalore, 5-7 September 2019
4.	Performance Analysis of OpenStack Controller	IEEE SmartNets 2019, Sharm El Sheikh, Egypt, 17-19 December 2019
5.	Comparison of OpenStack Orchestration Procedures	IEEE SmartNets 2019, Sharm El Sheikh, Egypt, 17-19 December 2019
6.	Antenna for 5G-Industry Perspective	Indian Conference on Antennas & Propagation (InCAP 2019), Ahmedabad

IPR Events

IPR day was celebrated at Delhi and Bengaluru campuses to felicitate and honour the intellect of our fellow C-DOTians that have been the foundation of our unique innovations.

Innovators in Delhi were felicitated by Hon'ble chief guest, Col. D R Gogoi, Director of Operations & Marketing, BECIL, Delhi on 22nd October 2019.

Innovators in Bengaluru were felicitated by Hon'ble chief guest, Shri. A S Kiran Kumar, Former Secy, Deptt. of Space and Former Chairman, ISRO, on 24th October 2019.

Transfer of Technology

Technology Development and efficient Transfer of Technology results in building enabling base for manufacturing ecosystem for India. The Transfer of Technology (ToT) philosophy of C-DOT aims at a high rate of success in the technology dissemination process and functions in line with the 'Make in India' initiative of Government of India. It aims at educating the recipients of various technologies not only on the infrastructural requirements and requisite know-how for production, but also at providing the licensed manufacturers with vital details about sources and specifications for the capital equipment and components.

During the FY 2019-2020, C-DOT has signed a total of 5 ToTs covering existing Technologies / Products. Of these 5 ToTs, 3 were signed with private sector manufacturers and 2 with CPSUs. As on 31st March 2020, a total of 98 ToTs were signed for 29 Technologies, with 27 different Licensees. C-DOT, through its ToT, has supported bulk manufacturing for deployment of its Optical Products like GPON, Routers & Layer 2 Switches, WiFi Products like BBWT, and STB technologies, through working very closely with the central public sector undertakings like M/s BEL, M/s ITI Ltd and M/s ECIL. For PAN India deployment of GPON in BharatNet, C-DOT is closely working with various units of M/s ITI and with private manufacturing partners. These deployments give a positive boost to building BharatNet which provides enabling infrastructure to the Government of India's 'Digital India' initiatives.

C-DOT technology Manufacturing Partners including CPSUs, and more notably the Licensees from private sector like M/s Cyient Ltd., M/s Aggressive EMS, M/s Kaynes Technology, and M/s Surbhi are working closely with C-DOT in reaching out to non-Government segment of business for WiFi based products such as Solar/High Speed Access Broadband Wireless Terminals and STB.

C-DOT Technologies / Products	C-DOT Licensees (ToTs Completed as on 31.03.2020)				
	PSUs (Govt.)	PSU Count	Private	Private Count	TOTAL
N Damini	BEL BLR, ITI RBL	2	SIS,SMCEL, UTL,VMC,HFCL	5	7
Bhavan Damini	BEL BLR,ITI RBL	2	SIS, VMC,UTL, HFCL	4	6
Daksh Damini	ITI RBL	1	HFCL, Tejas,RHPL ,CYIENT, KAYNES	5	6
6 slot OLT/Damini	BEL BLR,ITI RBL	2	VMC, UTL, HFCL	3	5
GPON OLT 5X	BEL BLR,ITI RBL	2	VMC, UTL, HFCL, SCTSPL, CYIENT, KAYNES	6	8
Chatur Damini &Titli Damak		--	HFCL , CYIENT,CSC,KAYNES	4	4
Titli Damak	ITI	1	Tejas,VMC	2	3
COLT (Joint Dev.)	--	--	Tejas	1	1
ONT 11			Tejas,CSC ,KAYNES	3	3
MAX-NG	ECIL, IL-KOTA ITI-MKP,BEL-KOT	4	--	--	4
AN RAX	ECIL, IL-KOTA, ITI-BLR,BEL-KOT	4	--		4
256 P RAX/SBM (Extn)	KELTRON, ITI MKP, IL Kota	3	--	--	3
BBWT Basic	ECIL, ITI-MKP	2	HFCL,SCTSPL,COMINT, Tarangg (MSME)	4	6
BBWT Solar	ITI- MKP	1	COMINT,TARANGG	2	3
BBWT Long Range	ITI-MKP	1	COMINT,TARANGG	2	3
BBWT (SOLAR NEW)	ITI,BEL-KOT	2	Cyient,Elcom,KAYNES, Aggressive	4	6
BBWT (HSAP)	ITI,BEL-KOT	2	Cyient,Elcom,KAYNES, Aggressive	4	6
PDO			RCV LTD., KAYNES	2	2
STBR	BEL BLR,ECIL,ITI BLR	3	HFCL	1	4
CRTR-210	BEL-KOT	1			1
L2 Switch	BEL BLR	1	HFCL	1	2
Enhanced L2 Switch	BEL-KOT	1			1
DRAX/Gyan Setu	ECIL ,ITI	2	--	--	2
NGSG Card	BEL BLR	1	--	--	1
GPSU (75W/125W)	ITI-Naini	1	SCTSPL,Tarangg(MSME)	2	3
GPSU(250W)	ITI-Naini	1			1
CGRAN	ITI-MKP	1		--	1
Power Amplifier	-		TPSED	1	1
STB	-	-	Surabhi	1	1
29 Technologies	***9 Licensees***	***41 ToTs***	***18 Licensees***	***57 ToTs***	***98 ToTs 27 Licensees***

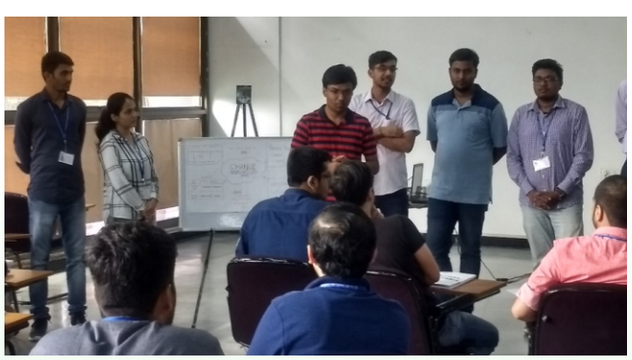
Knowledge Management

Training at C-DOT

Training is an important cornerstone for the growth and sustenance of an organization. So to enhance knowledge and upgrade skills of our employees regular training programmes are conducted across the year. Employees are encouraged to participate in various seminars and conferences. Various internal and external trainings on technical, managerial and soft-skills are arranged for the employees.

Delhi Office

Various topics on which training during the year 2019-2020 were arranged are ORCAD tool, RE19 induction training, Elastic Search, Sigrity tool, FPGA designing, Static Timing Analysis, Embedded system hardware, Containers & Dockers, FSE 2019 orientation, Office Procedures, Drafting, File Management & Record Management and training for ITS officers.



During FY 2019-20, a total of 297 staff of C-DOT Delhi, spending around 998 of man days, have undergone training through various training programs/events conducted round the year.

Bengaluru Office

Continuous efforts are made to enhance the skill sets of C-DOT employees. Hence employees are encouraged to participate in various seminars and conferences. Various internal and external trainings on technical, managerial and soft-skills are arranged for the employees.

Various topics on which training during the year 2019-2020 were arranged are 5G, Wi-Fi, DMF DFT, EMI/EMC, Signal and Power integrity, performance management, value engineering and reliability, Legal aspects, customs procedures for imports & exports, materials and warehouse management, process management and soft skill trainings.

Training performance management system was conducted for all the group leaders and managers to discuss about performance appraisal methods.

The training program 'Prerna' was a part of this year's training schedule, wherein the participants attended the Soft skill training programs, leadership skills, ethics, etc.

During FY 2019-20, a total of 286 staff of C-DOT Bengaluru, have undergone training through 31 various training programs/events conducted round the year.

Knowledge Management Centre

Knowledge Management Centre has been established to provide latest scientific and technical information to support C-DOT research and development activities. It includes a rich collection of more than 20130 technical books, 3449 Hindi books and over 62 periodicals and magazines besides country's 10 leading Newspapers and Newsletters (across locations). For the year 2019-20, a total of 290 new books were added to the library collections.

C-DOT has also subscribed to IEEE and ACM digital library through MCIT consortia. The IEEE Xplore digital library is a powerful resource for discovery of and access to scientific and technical content published by the Institute of Electrical and Electronics Engineers (IEEE) and its publishing partners. The ACM Digital Library (DL) is the most comprehensive collection of full-text articles and bibliographic records in existence today covering the fields of computing and information technology. The full-text database includes the complete collection of ACM's publications, including journals, conference proceedings, magazines, newsletters, and multimedia titles.

Corporate Memberships

S. N.	Name of the Memberships	Type of Membership
1.	All India Management Association (AIMA) www.aima-ind.org	Institutional Membership since 1994
2.	Asia Pacific Telecommunity (APT) www.aptsec.org	Affliate Membership since 2002
3.	Asia Pacific Network Information Centre (APNIC) www.apnic.net	Associate Membership since 2005
4.	Current Science Association www.currentscience.ac.in	Institutional Membership since 2016
5.	Electronic Industries Association of India (ELCINA) www.elcina.com	Associate Membership since 2010
6.	Electronics & Computer Software Export Promotion Council (ESC) www.escindia.in	Associate Membership since 2009
7.	European Telecommunication Standards Institute (ETSI) www.etsi.org	Associate Membership since 1999
8.	Fiber To The Home (FTTH) Council www.Gthcouncilap.org	Silver Membership since 2010
9.	3GPP www.3gpp.org/	Individual Membership since 2016

S. N.	Name of the Memberships	Type of Membership
10.	IEEE Standards Association	Corporate Membership since 2017
11.	India Electronics & Semiconductor association (IESA) www.iesaonline.org	Corporate Membership since 2013
12.	Institute of Directors (IOD) www.iodonline.com	Institutional Membership since 2015
13.	Institution of Electronics and Telecommunication Engineers (IETE) www.iete.org	Organizational Membership since 2010
14.	International Telecommunication Union (ITU)	Academia Membership since 2019
15.	Internet Protocol Television Society (IPTV)Broad Band India Forum www.iptvforum.org.in	Corporate Membership since 2015
16.	National Association of SoGware and Service (NASSCOM) www.nasscom.in	Associate Membership since 1996
17.	OneM2M www.onem2m.org	Individual Membership since 2016
18.	Pacific Telecommunication Council (PTC) India Foundation www.ptcif.org	Corporate Membership since 1997
19.	Telecom Equipment & Services Export Promotion Centre (TEPC) www.telecomepc.in	Corporate Membership since 2015
20.	Telecommunications Standards Development Society, India (TSDSI) www.tsdsi.org	Institutional Membership since 2014
21.	TM Forum www.tmforum.org	Corporate Membership since 2017
22.	WiFi Alliance www.wi-fi.org	Regular Membership since 2016
23.	Wireless Broadband Alliance www.wballiance.com/	General Membership since 2016

Library Memberships

S. N.	Name of the Memberships	Type of Membership
1.	American Centre www.amlibindia.state.gov.	Organizational Membership
2.	British Council www.britishcouncil.in	Access 10 Membership
3.	Delnet www.delnet.nic.in	Institutional Membership

Apprenticeship Training

The scheme of Apprenticeship training provides opportunities for practical training to graduate engineers, diploma holders (Technicians) and 10+2 vocational pass outs from about 10,000 industrial establishments/ organizations as per the policies and guidelines laid down by the Central Apprenticeship council (CAC) which is an apex Statutory body constituted under the Apprenticeship Act, 1961. As per these guidelines C-DOT also takes apprentices (graduate, diploma and ITI) on yearly basis.

Category	On roll as on 31-03-18	Period from 01-Apr-2019 to 31-Mar-2020			Strength as on 31-03-20
		Inducted	Resigned	Completed	
Graduate	0	27	3	0	24
Diploma-Technical	0	3	0	0	3
ITI	0	0	0	0	0
Total	**0**	**30**	**3**	**0**	**27**

Awards Received

1. ELCINA Defennovation Awards 2019 - Excellence in R&D (Large Category)

Product: C-Sat-Fi

The Award was presented in the 10th edition of Strategic Electronics Summit (SES 2019) – Defence & Aerospace, scheduled on 30th & 31st July, 2019 at Bangalore International Exhibition Center, (BIEC) Bengaluru. SES 2019. ELCINA defEnnovation Awards 2019 aims to recognize outstanding companies who have made exemplary contribution in the field of Defence Electronics (R&D, design and Manufacturing) demonstrating an innovative approach and excellence.

Shri Gopalakrishnan S, IAS, Joint Secretary, MeitY and Shri Sanjay Jaju, Jt. Secretary, DIP, Ministry of Defence, both key Central Government officials participated in this SES 2019.

2. 44th ELCINA Award 2018-19 - 2nd Prize

Product: Green (Hybrid) Power System-2KW

The Award Distribution Ceremony was held in India Expo Centre & Mart, Greater Noida, on 25th September 2019. The Awards were instituted by ELCINA in 1976 and since last 43 years, the Association has been presenting the same to recognize the achievements of electronics/IT Hardware manufacturing (ESDM) companies in India. These awards have stood the test of time and are highly regarded in industry circles.

Shri. Ajay Prakash Sawhney, IAS, Secretary MeitY, Govt of India was the Chief Guest and Shri. Sanjay Kumar Rakesh, IAS Joint Secretary MeitY, Govt of India was the Guest of Honour.

3. 10th Aegis Graham Bell Awards 2019 - Innovative Telecom Solution

Product: C-Sat-Fi

10th Aegis Graham Bell Awards in association with India Mobile Congress felicitated companies on 15th October 2019 at New Delhi. The award is a joint initiative of Aegis School of Business, Data Science, Cyber security and Telecommunication and India Mobile Congress to recognize innovators and their innovations. IMC-Aegis Graham Bell Awards aims to promote innovators in the Information and Communication Technology (ICT) and to recognize their outstanding innovations with a vision to make India an innovative hub for rising brilliance and virtuosity.

Chief Guest for the award ceremony was Shri Anshu Prakash, Chairman DCC & Secretary (T), Ministry of Communications, Government of India.

EVENTS 2019-20

APRIL 2019

- WSIS 2019
- Technology Day 2019 by Titan
- oneM2M Developers Event Organized by C-DOT

JULY 2019

- ITU – DOT Training at C-DOT
- Strategic Electronics Summit 2019

AUGUST 2019

- INDIA-AFRICA ICT Expo 2019
- C-DOT's 36th Foundation Day

OCTOBER 2019

- Indian Mobile Congress 2019
- TELSOM 2020

NOVEMBER 2019

- Visit of Hon'ble MoS to C-DOT

DECEMBER 2019

- Launch of CEIR in Delhi

JANUARY 2020

- Indian Science Congress 2020
- Visit by Member (Services), DoT
- Visit of Delegation from the Republic of Benin

FEBRUARY 2020

- BASIS Soft Expo 2020
- TEPC India Telecom 2020

1. WSIS 2019

C-DOT team and senior officials from DoT attended the World Summit on the Information Society (WSIS) 2019 conference in Geneva from 8-12 April, 2019.

During this visit, several meetings were held in the UN w.r.t. implementation of 'UN buildings Internal Navigation App'. C-DOT team met the Indian Ambassador, Mr. Ramesh Chander, who is the main driving force behind this idea. He expressed his wish to have India's presence and contribution felt at the UN in the form of a strong software technology expert – an app in everyone's mobile. The UN team was very much excited by the initiation of this project. It was decided, along with DoT, that C-DOT should conduct a pilot for the e-building.

2. Technology Day 2019 by Titan

Titan had organized a Technology tune in event on 15th & 16th of April 2019 and requested C-DOT to showcase its cutting edge products especially C-DOT miniPDO and Long range Wi-Fi at its factory campus in Hosur, Tamil Nadu.

C-DOT stall was visited by Mr. Bhaskar Bhat, Director, Titan Company and by Mr. CK Venkatraman, MD, Titan Company.

3. oneM2M Developers Event organized by C-DOT

C-DOT, under the aegis of "India-EU ICT Standardisation" organised the oneM2M developers' event for IoT startups/ companies during 25-26 April 2019 at Bengaluru.

4. ITU – DOT Training at C-DOT

Ms. Aruna Sundararajan, Secretary, DoT chaired the Inauguration Ceremony of 4-day ITU-DoT Training Programme on "Human and Technical Capacity Challenges through Digital Skills" at C-DOT Campus, New Delhi on 29th July 2019.

She mentioned that the South Asia office of ITU to be soon opened at C-DOT Delhi campus will strengthen the engagement and will be a hub for collaborating and sharing innovations.

5. Strategic Electronics Summit 2019

The 10th edition of Strategic Electronics Summit (SES 2019) – Defence & Aerospace, scheduled on 30th & 31st July, 2019 at Bangalore International Exhibition Centre, Bengaluru. The last nine editions of SES from 2010 to 2018 successfully brought Industry, Defence Establishment & Government together and this platform is growing year on year.

The 10th edition of Strategic Electronic Summit was inaugurated by Lt. Gen. Anil Kapoor, VSM, DG-EME, Ministry of Defence on 30th July, 2019 at BIEC, Bengaluru.

6. India - Africa ICT Expo 2019

The India Africa ICT Expo 2019 organized by TEPC with support from Ministry of Commerce & Industry and Ministry of Communications, Government of India, was held in Kigali, Rwanda on 5th & 6th August 2019. The event was Co-hosted by Ministry of ICT & Innovation, Rwanda Ministry of Trade & Industry, Rwanda and supported by Rwanda Development Board (RDB), Rwanda Utilities Regulatory Authority (RURA), Rwanda Information Society Authority (RISA), Rwanda Convention Bureau (RCB), ICT CHAMBER and National Industrial Research and Development Agency (NIRDA).

Business meetings were conducted by C-DOT Team, with the Minister, Ministry of ICT and Innovation, Rwanda, Minister, Ministry of Information Communication Technology and Courier Services, Zimbabwe, Senior Deputy Director, Ministry of Information and Communication Technology, Malawi, Director, Department of Information Technology, Ministry of Communication and Technology, Republic of Somaliland.

7. C-DOT's 36th Foundation Day

Hon'ble MoS, Sh. Sanjay Shamrao Dhotre launched C-DOT's three innovative products on its 36thFoundation Day - C-Sat-Fi (C-DOT Satellite Wi-Fi), XGSPON (10G Symmetrical Passive Optical Network) and C-DOT's Interoperable Set Top Box (CiSTB).

This year too, continuing the same tradition, C-DOT held a technical conference as part of GB Meemamsi Lecture Series 2019, wherein several field experts, telecom veterans and academicians from around the world shared their experiences. They discussed innovative ways to address the numerous issues and challenges faced by the technology developers, policy makers and end-users in the new era defined by the all-pervasive "Internet of Things (IoT)". The conference was jointly organized by C-DOT and European Telecommunications Standards Institute (ETSI) under the aegis of European Union (EU) funded project on "India-EU Cooperation on ICT-Related Standardization, Policy and Legislation" in association with Telecommunications Standards Development Society, India (TSDSI).

8. Indian Mobile Congress 2019

C-DOT participated in India Mobile Congress 2019 organized in Aerocity, New Delhi. C-DOT exhibited its products during the three-day exhibition and gathered huge audience to witness the demonstration of our indigenous capabilities.

The event was inaugurated by Hon'ble MoC Sh. Ravi Shankar Prasad and attended by the who's who of the telecom and allied sectors. Sh. Anshu Prakash, Secretary (Telecom) also visited C-DOT booth during the event. IMC 2019 saw the participation of more than 50 countries, telecom giants, OEMs, system integrators, technology experts, industry analysts, government officials, young professionals, startups and students.

9. TELSOM 2020

C-DOT attended Telecom Senior Officers Meeting and associated meetings 2019 at Vientiane during October 22–25 2019, as a part of delegation, led by Mr. Subodh Kumar Gupta, Director General Telecom with officers from Department of Telecommunications, and Indian Mission in Lao PDR. The delegation participated in the main session of TELSOM with India meeting of the event. The meeting endorsed the proposed ASEAN India ICT work plan 2020 to the TELMIN which approved the work plan that included one proposal from C-DOT. The opportunity of presence of delegations from other ASEAN member countries and other Dialogue partners was well used and several bilateral meetings such as Cambodia, Lao PDR, Myanmar, Viet Nam, Indonesia, Philippines and Japan were held on the sidelines.

10. Visit of MoS to C-DOT

Shri Sanjay Shamrao Dhotre, Hon'ble Minister of State for Communications visited C-DOT Bangalore campus on 12th Nov 2019. He witnessed our strengths and capabilities in the field of Telecom sector. He had a detailed discussion on C-DOT technologies with several C-DOT representatives. Following products were demonstrated in the Labs:

- C-DOT STB , CAS and OTT
- C-DOT Gyansetu
- C-DOT Wi-Fi products

11. Launch of CEIR in Delhi

Hon'ble Minister of Communications, Shri Ravi Shankar Prasad, launched the Central Equipment Identity Register (CEIR) to facilitate blocking and tracing of stolen or lost mobile phones in Delhi. This system has been developed by C-DOT under Department of Telecom and aims to work in collaboration with Delhi Police and Telecom service providers. On this occasion, Shri Anil Baijal, Hon'ble LG of Delhi, Shri Anshu Prakash, Secretary(T), Shri Amulya Patnaik, Commissioner of Delhi Police, officers from Delhi Police & DoT, representatives of telecom industry and media persons were also present.

12. Indian Science Congress 2020

107th edition of the Indian Science Congress (ISC), India's most prestigious scientific summit was organized by the Indian Science Congress Association (ISCA), Kolkata, and the University of Agricultural Sciences (UAS), Bangalore at its sprawling GKVK campus, Bengaluru from 3-7th January, 2020. It was inaugurated by Shri Narendra Modi, Hon'ble Prime Minister of India.

C-DOT participated in the Exhibition and showcased its Indigenous expertise in the telecom domain.

13. Visit by Member (Services), DoT

Shri Arun Aggarwal, Member (Services), along with other senior members from DoT visited C-DOT campus Bengaluru on 21st Jan 2020.

14. Visit of Delegation from Republic of Benin

Hon'ble Minister for Social Affairs and Microfinance of Republic of Benin, Ms. Médessè Véronique Tognifode Mewanou, visited C-DOT along with delegation on 22nd January 2020. The meeting gave C-DOT an opportunity to showcase its strengths and explore possible areas of technical co-operation in the areas of digital communication.

15. BASIS Soft Expo 2020

C-DOT participated in BASIS Soft Expo 2020, Dhaka, Bangladesh during 6-9 February, 2020 and showcased its indigenous technologies and innovations to Bangladesh ICT Industry.

16. TEPC India Telecom 2020

An Exclusive International Business Expo, was organized by TEPC (Trade and Export Promotion Centre) at Ashoka Hotel, New Delhi on 11th February 2020 under Market Access Initiative Scheme (MAI) of Department of Commerce, Government of India.

The event attracted more than 100 foreign high-profile delegates from the Information and communication technology (ICT) industry from over 30 countries, including Ministerial/Official delegations from Afghanistan, Bhutan, Burundi, Cambodia, Indonesia, and Nigeria. C-DOT showcased its products and solutions from Wireless, GPON, NMS, Geo Intelligence and Router. Officials from several countries including Cambodia, Afghanistan, Indonesia, Nigeria, Burundi, Sudan etc. showed a great deal of interest in C-DOT technologies and had follow-up meetings post event. The TEPC's flagship event is held every year and is a unique platform where potential buyers from across the

globe are invited to meet Indian suppliers of telecom equipment and services as well as key stakeholders in the Indian Government.

Subsequently, on the basis of B2B meetings held during India Telecom, Hon'ble Minster of Communication from Maldives and high level delegations from Kenya and Malawi visited C-DOT to understand our Indigenous technologies and discuss opportunities of future collaborations.

HR Initiatives

Women Empowerment

C-DOT's Management has always been sensitive to gender issues and has consistently worked towards creating organizational culture reflecting gender equality. Presently, about 32.3% of staff in C-DOT are women.

Existing Policies

- All female staff members are allowed to avail up to 180 days maternity leave & up to 90 days leaves subsequent to that (270 days inclusive of 180 days maternity leave). For miscarriage/abortion, leave of a total of 45 days in the entire service span is permissible.
- Child Care leave is also granted to eligible female staff on their applying for the same, as per rules.
- C-DOT offers accommodation and transport benefits to all its women employees with different options that maybe availed as per individual needs. This ensures the safety and security of all women employees in the company.
- Reimbursement for residential telephone expenses is admissible to 100% of the women staff.
- Career growth opportunities are available to women employees in C-DOT. In the current financial year, of the total employees promoted to higher grades 26% of them were women.
- In management cadres (Team Leaders, Group Leaders, Technical Experts and Sr. Technical Experts) about 26% are women.
- As per the directives of Supreme court, C-DOT has a Complaint Committee for its Centres, at Delhi and Bangalore in case of any complaints relating to Sexual Harassment of women staff at work place for fair and justified view of the complaints, if any, and recommend suitable action on the same to the C-DOT Board.
- Two Sexual Harassment complaints were received by the cell and were duly solved in time frame. The Committee conducted enquiry into the complaints and both proved to be false.

Women Welfare

- For the purpose of coverage for hospitalization expenses, C-DOT has taken a Tailor-made group medi-claim insurance from National Insurance Company Ltd. for Staff members (and their families). The staff in EI grade and below have a coverage of 3.5 lakhs and above and Staff in EII grade and above have a coverage of 5 lakhs and above (7.5 Lakhs, 10 Lakhs and 15 Lakhs). The Group Medi-claim policy has been made effective from 01 April 2006.
- C-DOT has Grievance redressal mechanism for its staff to provide them with an easy & readily accessible machinery for prompt disposal of their day-to-day grievances.

Recruitment of SC/ST and persons with disabilities

- For recruitment of persons with disabilities and candidates belonging to SC/ST category, C-DOT follows government rules providing for reservation in jobs. C-DOT has also conducted special reservation drive in various campuses to fill up its' shortfall.
- C-DOT has a system in place to look after the welfare of persons belonging to these categories and address any problems / complaints that may come up.

Benefits for persons with disabilities

- C-DOT follows guidelines issued by Government of India with respect to reservations in jobs for persons with disabilities.
- The physical handicapped employees are eligible for double the rates of transport allowance.
- The C-DOT Campus at Delhi has been constructed in such a manner so as to ensure barrier free environment for the persons with disabilities. The main entrance/exit can be approached through a ramp together with stepped entry. Even elevators connecting the various working areas have been installed in way to facilitate persons with disabilities to move around freely from one wing to another.

Swachhta Action Plan

Under the initiative of 'Swachhta-hi-Seva' of Swachh Bharat Mission, C-DOT has focused on community sharing along with ongoing activities to promote, maintain and sustain the cleanliness in the campus and neighboring localities.

Following programs were conducted within the campus and outside the campus to promote the message of Swachh Bharat Mission:-

- Waste collected from canteen and garden are decomposed through composter into organic product for effective utilization of waste material.
- Organized Cleanliness Drive and plantation drive in Swachhta Pakhwada to promote healthy and hygiene life style among C-DOT Staff.
- Conducted regular training session for contractual staff to spread the importance of healthy and hygiene environment into surrounding.
- Conducted Swachhta related activities like Essay Competition, Drawing Competition, Nukkad Natak etc. to spread the message of Swachhta-hi-Seva and 'Say No To Single Use Plastics'

Promotion of Hindi

C-DOT is making serious efforts to ensure compliance to the Official Language Policy of Government of India. To create awareness among the employees, C-DOT organizes different programmes throughout the year. Many innovative programmes have been initiated at both Delhi and Bengaluru centres of C-DOT in this regard. Hindi workshops are held regularly on topics of relevance.

All the meeting of C-DOT Official Language Committee at Delhi and Bengaluru were held timely and regularly. C-DOT participated in TOLIC activities with full enthusiasm. All the reports are sent to Department of Official Language, Ministry of Home Affairs and Department of Telecommunications regularly and timely.

Hindi workshops “Samvad” are organized on quarterly basis on topics of relevance.

During the year few of the activities, worth mentioning are as follows:

Hindi Utsav

The Hindi fortnight at C-DOT is celebrated not just for the sake of organising but as Hindi Utsav every year so that there is no time limit and its enthusiasm can be maintained throughout the year. Various programs and competitions are organized during this period.

The month of September, 2019 was celebrated as Hindi Utsav at C-DOT offices at New Delhi and Bengaluru. Many competitions and events were organized during the month to motivate C-DOTians to do their day-to-day work in Hindi

"Utsav" is launched with "Inse Miliye ..." an interactive programme with a celebrity from different fields of art, culture, science and social services. Many competitions and events are organized during this period. The format of these programmes are prepared as per work requirement and cultural ethos of the organization.

This year some new competitions were introduced to attract more participation. Competitions like Katha Rachna, Ekal Abhinay, Samachar Vachan, Hindi Commentary, Varg Paheli evam Bhasha Gyan had been very successful in motivating people to once again connect to the world of literature and books.

Competitions such as story writing and poetry writing are also organized to promote original writing among the personnel. Famous personalities of their respective fields are invited as the judges in the competitions. All the members of C-DOT enjoy it and there is an atmosphere of inspiration and encouragement to use Hindi more and more in day-to-day official work.

"Utsav" concludes by presenting the best entries of the contest and distributing prizes, as well as certificate and participation prizes to boost the morale of all participants. Large number of participation is seen every year, including senior officials in almost all the competitions.

Bhashantar: The Translation tool

A competition was announced to develop a translation tool for making all emails by translating simultaneously from English to Hindi in C-DOT webmail to achieve the target of 100% correspondence in Hindi. Overwhelming response was achieved and final tool is in the last stage of development.

An award of Rs 51,000 will be given to the developer team on successful implementation of the solution.

Letter writing competition

In order to promote the fading letter writing art in the era of internet and social media, a "letter writing" competition was organized in Hindi Utsav on the theme "C-DOT of 2040" to make the participants think about future strategies and dream for a better C-DOT.

Prashnottari: The Quiz

An audio-visual Quiz was also organized in Hindi, which was liked by one and all. The competition was interesting and informative and many questions were also asked for the audience.

Paramparik Abhivadan: Traditional Indian Greetings

In order to promote the traditional Indian greetings and conversation in Hindi over phone, Rajbhasha Ekak used to call and talk to about 50 personnel every day during this period. People greeting with traditional Indian way instead of “hello”, were awarded with a token gift.

Rajbhasha Shree Award

Rajbhasha Shree Award has been introduced to encourage people to do their maximum official work in Hindi. The 3 best performers of the year are awarded with Cash prize of Rs. 5000.00 each and a Citation.

Separate Rajbhasha Website

The "C-DOT Rajbhasha" website was launched at the prize distribution ceremony of Hindi Utsav 2019. This website provides information about Official Language Rules and other subjects. Videos and photographs of various programs can also be viewed through this website.

Kavi Sammelan

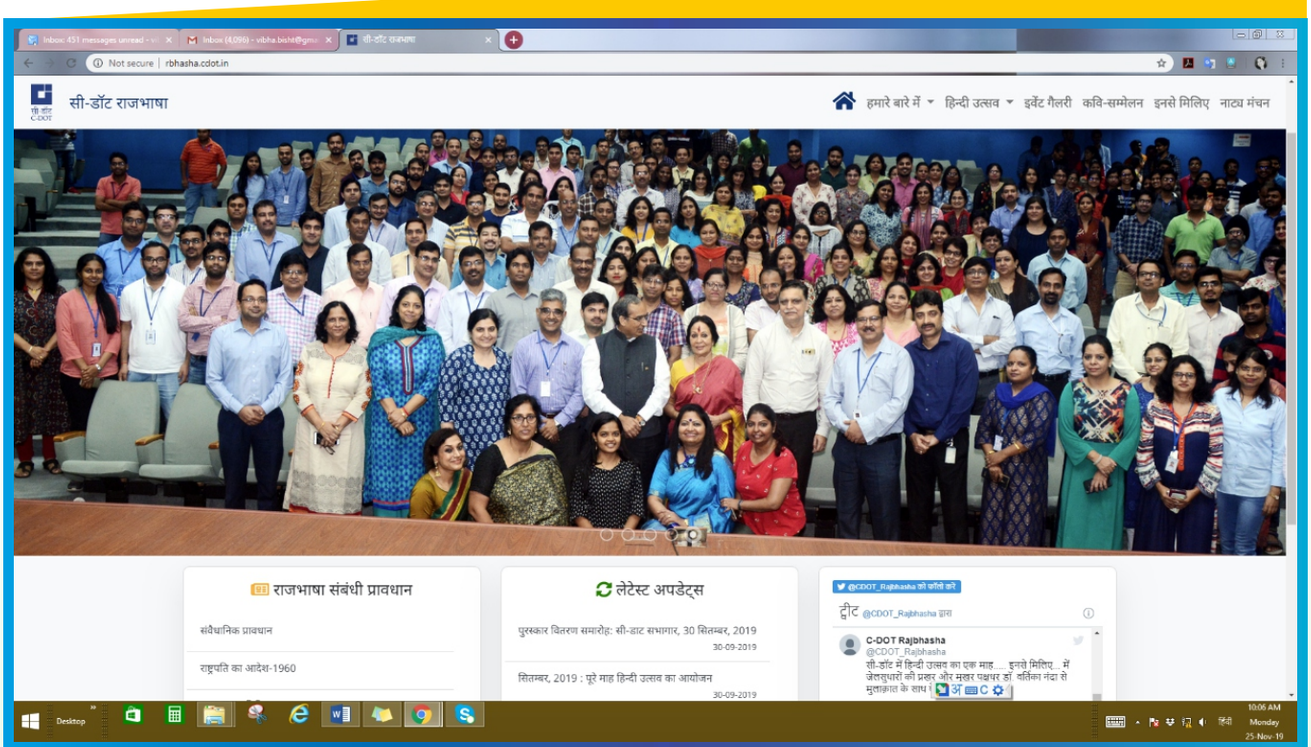
A grand Kavi Sammelan was organized during Hindi Utsav. Eminent poets like Dr. Sheen Kaaf Nizaam, Dr. Ashok Chakradhar, Mr. Alok Shrivastava, Dr. Uday Pratap Singh and Dr. Vivek Gautam mesmerized the audiences with their heart rending poems. While the Kavi Sammelan was instrumental in connecting people with literature, culture and language, it also proved effective in awakening the sensitivity in today's generation.

Inse Miliye…

Well-known prison reformer, senior journalist and founder of "Tinka-Tinka Foundation", "Dr. Vartika Nanda "was invited for this years' Inse Miliye... Dr. Nanda is working as a ray of hope in the lives of people in jails. She shared her views about improving the conditions of Indian prisons and human rights of prisoners etc. She tried to motivate people to come forward and work to uplift the society.

Drama Enactment

One drama is staged every year at C-DOT during the Hindi Utsav. This year, Dr. Dharamvir Bharti's famous work "Sooraj ka Saatvan Ghoda" was staged. The artists of the National School of Drama (NSD) brought this composition to life with their celebrated performances.



Vigilance Awareness Initiatives

During the year 2019-20 a number of steps were undertaken to carry our vigilance activities, primarily preventive Vigilance, as per the directives of CVC. Practices and procedures mainly related to Operation and Maintenance contracts and Disciplinary proceedings were reviewed and corrective measures were taken. Annual Property Returns along-with prior information for purchase of immovable property are now filed regularly by the staff of C-DOT. Moreover, now most of the procurement is done either through Central Procurement Portal (CPP) or Government e-Marketplace (GeM).

Integrity Pact has been implemented in C-DOT with the appointment of Independent External Monitor (IEM). In C-DOT Vigilance Clearances has been introduced for resignation/ superannuation/clearance of no dues/promotions (lateral and vertical) etc.

Vigilance Awareness Week 2019 was observed successfully in C-DOT (both at Delhi and Bengaluru campus) from 29th Oct.–2nd Nov. 2019. The keynote address was delivered by Shri P S Bawa, Board Member, Transparency International India, Former DGP, Sikkim, Advisor, Transparency International India. Most of the employees of C-DOT have taken integrity e-pledge.

37
Auditors Report and Management Replies
40
Audited Financial Statements
Financial Statements 2019-20
52
Significant Accounting Policies
54
Notes on Accounts

REPORT OF THE AUDITORS ON THE ACCOUNTS OF C-DOT FOR THE YEAR ENDED MARCH 31, 2020 AND MANAGEMENT'S REPLIES THEREON

To the Members of the Board of Centre for Development of Telematics (C-DOT)

S. N.	Auditor's Observation	Management's Replies Thereon
1.	**Report on the Standalone Financial Statements** We have audited the financial statements of Centre for Development of Telematics(C-DOT), which comprise the Balance Sheet at March 31st 2020, and the Statement of Income & Expenditure for the year then ended, and notes to the financial statements, including a summary of significant accounting policies and other explanatory information for the year then ended.	Factual position stated.
2.	**Responsibilities of Management and Those Charged with Governance for the Financial Statements** The Management is responsible for the preparation and fair presentation of the financial statements in accordance with the applicable Accounting Standards issued by Institute of Chartered Accountants of India (ICAI), and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error in accordance with Societies Registration Act, 1860 and Generally Accepted Accounting Principles in India. In preparing the financial statements, management is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so. Those charged with governance are responsible for overseeing the entity's financial reporting process.	Factual position stated.
3.	**Auditor's Responsibilities for the Audit of the Financial Statements** Our responsibility is to express an opinion on these standalone financial statements based on our audit. Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.	Factual position stated.

S. N.	Auditor's Observation	Management's Replies Thereon
4.	**Basis for Qualified Opinion** **A.** **Refer Note 4(b)(i)** which states that outstanding dues amounting to Rs. 3187.87 lakh as at March 31, 2020 due from one of the licensees, were to be adjusted by transfer of land and building at Bangalore unit. The status continues from the year 2004-05. On the basis of information provided, the Centre is occupying the space since then and not paying any rent. In absence of any confirmation by the counter party, we are unable to express our opinion on the realisability/ adjustment of the said amount.	The particular licensee and C-DOT are both under the administrative control of the Department of Telecommunications, Ministry of Communication, and the matter referred to in the observation is under active consideration by the Nodal Ministry.
	B. The entity has not made provision for Leave Travel Concession and Post Employment Medical benefit, being long term defined benefits. This constitute departure from the Accounting Standard-15 “Employee Benefit”	As explained in para 10 of Schedule 14 "Significant Accounting Policies" to these Accounts, the centre has adopted Actuarial valuation of liability for Gratuity and Leave encashment as at 31.03.2020. Provision for the same has been made. As for Leave Travel Concession and Post Employment Medical Benefit, no provision is made, as the same is accounted on incidence basis as per the accounting policy.
	C. The entity while rendering services, has in some of the cases, accounted for expenditure in the year it incurred whereas corresponding income is recognized in a different year as and when the revenue collection is reasonably certain/accepted by the counter party. It is therefore not in accordance with the completed service contract method or proportionate completion method in respect of recognition of revenue as per the principles laid down in the Accounting Standard-9 “Revenue Recognition”	Noted for compliance.
	D. Sundry debtors in the balance sheet is Rs 18,948.98 Lakhs net off provision for bad and doubtful debts, some of them remain unconfirmed. We are unable to express our opinion on the realisability of the amounts included in the said figure, particularly in respect of the amounts which are outstanding for over three years. **Refer Note No.4(b)**	These sundry debtors include a major portion receivable from BSNL, BBNL, MTNL and ITI which are under the administrative control of the Department of Telecommunications, Ministry of Communication. Synergy initiatives have been conducted by Nodal Ministry for resolution.
5.	**Qualified opinion** We conducted our audit in accordance with the Standards on Auditing (SAs) issued by ICAI. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the entity in accordance with the ethical requirements that are relevant to our audit of the financial statements and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.	No comments.

S. N.	Auditor's Observation	Management's Replies Thereon
	In our opinion and to the best of our information and according to the explanations given to us, except for the effects of the matters described in the Basis for Qualified Opinion paragraph above, the financial effect whereof cannot be determined, the accompanying financial statements give a true and fair view of the financial position of the entity as at March 31st, 2020, and of its financial performance for the year then ended in accordance with the Accounting Standards issued by the Institute of Chartered Accountants of India(ICAI) and give the information in accordance with the Societies Registration Act, 1860.	
6.	**Other Matters** The audit of Bangalore unit of the entity was conducted from Delhi office. The visit of the unit was not practical in view of the pandemic condition due to Covid 19. We obtained sufficient and appropriate information required for our audit evidence. The value of stores was relied upon on the basis of physical verification conducted by the management at Bangalore office. Our report is therefore subject to such limitations.	Factual position stated.

For Jain Chopra & Company
Chartered Accountants
Firm Regn. No. 002198N

Sd/-
(Ashok Chopra)
Partner
Membership No. 017199

For Centre for Development of Telematics

Sd/-
(K. Ramchand)
Executive Director

Place : New Delhi
Date: Sep-18-2020

BALANCE SHEET AS AT MARCH 31, 2020

(in Rupees)

Particulars	Schedule No.	2020	2019
CORPUS/CAPITAL FUND AND LIABILITIES			
Corpus/Capital fund	1	3,29,66,14,526.02	3,33,83,30,102.21
Current liabilities and provisions	2	1,80,90,57,358.95	2,23,04,99,666.94
TOTAL		**5,10,56,71,884.97**	**5,56,88,29,769.15**
ASSETS			
Fixed assets	3		
Gross block		6,81,34,06,967.35	6,71,41,97,598.41
Less :- Depreciation		5,74,43,09,525.96	5,49,01,25,619.74
Net block		1,06,90,97,441.39	1,22,40,71,978.67
Asset in transit	3	-	-
Capital work-in-progress	4	72,46,064.50	62,52,840.00
Investments - long term	5	-	-
Current assets, loans, advances and deposits	6	4,02,93,28,379.08	4,33,85,04,950.48
TOTAL		**5,10,56,71,884.97**	**5,56,88,29,769.15**
Significant Accounting Policies	**14**		
Contingent Liabilities and Notes on Accounts.	**15**		

Schedules 1-15 form an integral part of the Financial Statements.

As per our report of even date.

For Jain Chopra & company
Chartered Accountants
Firm Regn. No. 002198N

For and on behalf of
Centre for Development of Telematics

Sd/-
(Ashok Chopra)
Partner
Membership No. 017199

Sd/-
(G.Mukundan)
Chief Finance Officer

Sd/-
(K. Ramchand)
Executive Director

Place : New Delhi
Date: Sep-18-2020

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2020

(in Rupees)

Particulars	Schedule No.	2020	2019
INCOME			
Income from TOT, Royalty, TSR/FSR & Publications	7	89,47,59,583.30	62,34,20,166.00
Interest earned	8	5,28,86,897.94	7,94,47,467.00
Other income	9	2,66,83,886.71	5,28,34,872.50
TOTAL (A)		**97,43,30,367.95**	**75,57,02,505.50**
EXPENDITURE			
Establishment expenses	10	2,66,33,92,575.47	2,41,35,14,325.12
Operational expenses	11	53,53,86,421.49	1,00,09,26,254.48
Other administrative expenses	12	30,01,94,008.61	34,84,02,032.49
Depreciation	3	25,43,84,611.15	30,80,46,554.46
TOTAL (B)		**3,75,33,57,616.72**	**4,07,08,89,166.55**
Excess of expenditure over income for the year [(B)-(A)]		2,77,90,27,248.77	3,31,51,86,661.05
Add/(Less) :-			
Adjustments pertaining to prior period items (Net)	13	(73,11,672.58)	13,84,959.62
Extraordinary Expenses		-	-
Balance being excess of expenditure over income		2,77,17,15,576.19	3,31,65,71,620.67
Add :- Excess of expenditure over income of previous years		30,48,66,23,059.91	27,17,00,51,439.24
Balance being deficit carried to Corpus / Capital fund		**33,25,83,38,636.10**	**30,48,66,23,059.91**
Significant Accounting Policies	14		
Contingent Liabilities and Notes on Accounts.	15		

Schedules 1-15 form an integral part of the Financial Statements.

As per our report of even date.
For Jain Chopra & company
Chartered Accountants
Firm Regn. No. 002198N

Sd/-
(Ashok Chopra)
Partner
Membership No. 017199

For and on behalf of
Centre for Development of Telematics

Sd/-
(G.Mukundan)
Chief Finance Officer

Sd/-
(K. Ramchand)
Executive Director

Place : New Delhi
Date: Sep-18-2020

SCHEDULE 1- CORPUS/CAPITAL FUND

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	2020	2019
Grants from Department of Electronics & Information Technology (Formerly known as Department of Electronics)		
Accumulated balance	33,52,00,000.00	33,52,00,000.00
Subtotal (A)	**33,52,00,000.00**	**33,52,00,000.00**
Grants from Department of Telecommunication		
Balance at the beginning of the year	33,48,97,53,162.12	30,88,97,53,162.12
Add:- Contributions towards corpus/capital fund during the year	2,73,00,00,000.00	2,60,00,00,000.00
Subtotal (B)	**36,21,97,53,162.12**	**33,48,97,53,162.12**
Total [(A)+(B)]	**36,55,49,53,162.12**	**33,82,49,53,162.12**
Less :- Balance of net expenditure transferred from the Income and Expenditure account	33,25,83,38,636.10	30,48,66,23,059.91
TOTAL	**3,29,66,14,526.02**	**3,33,83,30,102.21**

SCHEDULE 2-CURRENT LIABILITIES AND PROVISIONS

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	2020	2019
A. CURRENT LIABILITIES		
1 Sundry Creditors		
a) For Goods	10,36,36,594.59	31,77,17,113.54
b) Others	30,86,38,566.20	51,70,89,318.76
2 Advances received		
- For Funded Projects	33,69,05,443.76	56,39,88,841.75
3 Statutory Liabilities	6,88,84,772.00	6,79,65,149.00
4 Other Current Liabilities	10,52,67,416.40	10,25,99,478.89
Subtotal (A)	**92,33,32,792.95**	**1,56,93,59,901.94**
B. PROVISIONS		
1 Gratuity	13,11,19,654.00	6,25,90,856.00
2 Earned leave	75,46,04,912.00	59,85,48,909.00
Subtotal (B)	**88,57,24,566.00**	**66,11,39,765.00**
TOTAL (A+B)	**1,80,90,57,358.95**	**2,23,04,99,666.94**

SCHEDULE 3-FIXED ASSETS

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	Gross Block				Depreciation				Net Block	
	As at 01.04.2019	Additions	Adj./ Write-off	As at 31.03.2020	As at 01.04.2019	For the year	Adj./ Write-off	As at 31.03.2020	As at 31.03.2020	As at 31.03.2019
(A) Fixed Assets										
Land -Free Hold	12,00,00,000.00	-	-	12,00,00,000.00	-	-	-	-	12,00,00,000.00	12,00,00,000.00
Building-Office	57,01,80,967.65	-	-	57,01,80,967.65	43,89,78,266.43	1,31,20,270.12	-	45,20,98,536.55	11,80,82,431.10	13,12,02,701.22
Building-Residential	2,36,27,434.00	-	-	2,36,27,434.00	1,62,85,595.13	3,67,091.94	-	1,66,52,687.07	69,74,746.93	73,41,838.87
R & D Equipment	2,22,88,32,068.30	1,33,56,607.64	-	2,24,21,88,675.94	1,75,59,17,993.52	7,29,40,600.26	-	1,82,88,58,593.78	41,33,30,082.16	47,29,14,074.78
R& D Computers	2,90,90,69,625.29	8,45,89,229.42	-	2,99,36,58,854.71	2,63,80,59,083.19	14,22,44,839.01	-	2,78,03,03,922.20	21,33,54,932.51	27,10,10,542.10
Office Equipments & Appliances	39,06,16,059.56	5,51,444.26	(5,16,281.00)	39,06,51,222.82	32,98,40,061.34	91,64,187.00	(1,99,219.93)	33,88,05,028.41	5,18,46,194.41	6,07,75,998.22
Furniture & Fixtures	41,25,07,453.23	8,50,562.62	-	41,33,58,015.85	25,16,80,629.75	1,61,68,331.82	-	26,78,48,961.57	14,55,09,054.28	16,08,26,823.48
Library Books	5,93,63,990.38	3,79,291.00	(1,485.00)	5,97,41,796.38	5,93,63,990.38	3,79,291.00	(1,485.00)	5,97,41,796.38	-	-
Total	6,71,41,97,598.41	9,97,27,134.94	(5,17,766.00)	6,81,34,06,967.35	5,49,01,25,619.74	25,43,84,611.15	(2,00,704.93)	5,74,43,09,525.96	1,06,90,97,441.39	1,22,40,71,978.67
Previous year's total	6,22,35,94,676.10	49,06,04,142.31	(1,220.00)	6,71,41,97,598.41	5,18,20,80,285.28	30,80,46,554.46	(1,220.00)	5,49,01,25,619.74	1,22,40,71,978.67	1,04,15,14,390.82
(B) Assets in Transit									-	-

SCHEDULE 4-CAPITAL WORK IN PROGRESS

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	As at 01.04.2019	Additions	Trf. to fixed assets	As at 31.03.2020
Campus - Delhi				
Campus - Residential Complex	62,52,840.00	9,93,224.50	-	72,46,064.50
Total	**62,52,840.00**	**9,93,224.50**	**-**	**72,46,064.50**
Previous Year Balance	62,52,840.00	-	-	62,52,840.00

SCHEDULE 5-INVESTMENTS-LONG TERM

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	Number of fully paid equity shares	Face value per share	2020	2019
UNQUOTED (AT COST)				
JOINT VENTURE COMPANY				
C-DOT ALCATEL LUCENT RESEARCH CENTRE PVT LTD (CARC)	5,20,00,000	10	52,00,00,000.00	52,00,00,000.00
Less:- Provision for bad & doubtful investments			52,00,00,000.00	52,00,00,000.00
TOTAL			**-**	**-**

SCHEDULE 6-CURRENT ASSETS, LOANS, ADVANCES AND DEPOSITS

(Forming part of the Balance Sheet as at March 31, 2020)

(in Rupees)

Particulars	2020	2019
A. CURRENT ASSETS		
1 Inventories (as taken, valued and certified by the Management)		
a) Stores and spares	70,09,32,090.51	65,36,63,579.85
b) Inventory in transit	3,27,303.42	25,86,276.49
	70,12,59,393.93	65,62,49,856.34
Less: Disposable stores & spares	8,53,89,440.00	-
	61,58,69,953.93	**65,62,49,856.34**
2 Sundry debtors		
a) Debts outstanding for a period exceeding six months	1,58,40,91,551.70	1,45,90,69,161.16
b) Others	32,97,44,313.08	53,74,65,556.80
	1,91,38,35,864.78	1,99,65,34,717.96
Less:- Provision for bad & doubtful debts	1,89,37,915.00	1,89,37,915.00
	1,89,48,97,949.78	**1,97,75,96,802.96**
3 Bank Balances		
a) With Scheduled banks		
On Current Accounts	1,21,01,316.29	52,07,311.29
On Deposit Accounts	76,45,00,000.00	53,86,31,798.22
On Savings Accounts	20,00,71,030.48	54,86,06,504.18
	97,66,72,346.77	**1,09,24,45,613.69**
Total (A)	**3,48,74,40,250.48**	**3,72,62,92,272.99**
B. LOANS & ADVANCES		
1 Loans		
a) Staff	46,55,792.00	55,35,108.00
b) CARC Pvt Ltd	18,45,78,500.00	18,45,78,500.00
	18,92,34,292.00	19,01,13,608.00
Less:- Provision for Bad & doubtful Loans -CARC (P) Ltd	18,45,78,500.00	18,45,78,500.00
	46,55,792.00	**55,35,108.00**
2 Advances and other Amounts Recoverable in Cash or in Kind or for value to be received		
a) Contractors & Suppliers	7,82,96,068.08	12,41,58,066.90
b) Employees	19,49,546.15	19,57,149.15
c) Prepaid expenses	1,56,17,135.10	1,28,52,960.08
	9,58,62,749.33	**13,89,68,176.13**
3 Interest Accrued		
a) Staff Loan	5,25,872.00	4,69,394.48
b) On Bank Deposits	61,19,254.79	86,64,687.78
c) CARC Loan	5,98,58,060.00	5,98,58,060.00
	6,65,03,186.79	**6,89,92,142.26**
4 Claims Receivable	28,76,93,368.31	31,98,88,856.31
Less:- Provision for Bad & doubtful Claims Receivable	19,78,41,104.35	19,78,41,104.35
	8,98,52,263.96	**12,20,47,751.96**
5 Tax deducted at source	**19,45,29,659.86**	**22,29,19,785.86**
6 Input Tax Credit	**8,05,31,424.66**	**4,43,39,450.28**
Total (B)	**53,19,35,076.60**	**60,28,02,414.49**
C. DEPOSITS		
1 Office Building	40,500.00	40,500.00
2 Others	93,94,713.00	93,69,763.00
3 EMD	5,17,839.00	-
Total (C)	**99,53,052.00**	**94,10,263.00**
TOTAL (A+B+C)	**4,02,93,28,379.08**	**4,33,85,04,950.48**

SCHEDULE 7-INCOME FROM TOT, ROYALTY, TSR/FSR & PUBLICATIONS

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020	2019
1) Income from Royalty	-	6,94,31,080.00
2) Income from Transfer of Technology (TOT)	93,00,000.00	1,33,50,000.00
3) Technology/Field support receipts (TSR/FSR)	88,53,70,582.30	54,05,64,730.00
4) Income from Publications	89,001.00	74,356.00
TOTAL	**89,47,59,583.30**	**62,34,20,166.00**

SCHEDULE 8-INTEREST EARNED

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020	2019
1) On term deposits with Scheduled Banks	3,62,19,682.03	4,11,95,636.22
2) On savings accounts with Scheduled Banks	41,73,899.39	58,46,698.76
3) On loans to employees	6,89,877.52	5,69,251.02
4) Others	1,18,03,439.00	3,18,35,881.00
TOTAL	**5,28,86,897.94**	**7,94,47,467.00**

SCHEDULE 9-OTHER INCOME

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020	2019
1) Income from rent	72,11,900.00	3,20,76,346.00
2) Gain due to foreign exchange transalation	2,92,987.80	11,53,688.28
3) Miscellaneous income	1,91,77,513.91	1,96,03,618.22
4) Profit on sale/disposal of assets	1,485.00	1,220.00
TOTAL	**2,66,83,886.71**	**5,28,34,872.50**

SCHEDULE 10-ESTABLISHMENT EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020	2019
a) Salaries and wages	2,09,86,87,857.00	1,89,23,65,574.88
b) Bonus	-	12,86,044.00
c) Contributions to provident fund	17,05,65,689.00	15,34,97,522.00
d) Contributions to other fund	1,26,95,557.00	1,31,05,558.00
e) Gratuity provided for employees	13,11,19,654.00	6,25,70,906.00
f) Staff welfare expenses	24,72,83,176.12	27,37,74,251.79
g) Rent on residentials & maintenance expenses	-	5,79,714.00
h) Recruitment and training expenses	30,40,642.35	1,63,34,754.45
TOTAL	**2,66,33,92,575.47**	**2,41,35,14,325.12**

SCHEDULE 11-OPERATIONAL EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020	2019
a) R&D components & consumables	16,81,77,838.83	37,46,04,623.71
b) Freight & forwarding charges	87,25,204.73	1,76,18,723.77
c) Liquidated Damages Expenses	1,13,90,656.00	-
d) Repair & maintenance - R&D/office equipments	8,15,66,115.29	8,14,49,909.13
e) Design, development & technology support expenses	10,93,18,264.00	46,18,64,253.00
f) Technical, Apprentice & Consultancy expenses	6,81,21,502.64	6,31,43,517.87
g) Testing charges	26,97,400.00	22,45,227.00
h) Disposable Stores & Spares	8,53,89,440.00	-
TOTAL	**53,53,86,421.49**	**1,00,09,26,254.48**

SCHEDULE 12-OTHER ADMINISTRATIVE EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020		2019	
a) Travelling and conveyance expenses		3,18,66,397.47		6,31,91,281.66
b) Vehicle hire charges		22,74,285.06		41,03,951.50
c) Rent, rates & taxes		77,61,401.50		28,78,633.00
d) Interest/ penalty paid		2,01,264.19		40,314.00
e) Electricity & water charges		10,68,80,510.17		9,87,56,664.76
f) Repair & maintenance - Others		8,47,40,832.07		10,15,07,523.64
g) Newspaper, periodicals & journals		71,71,765.16		75,87,106.63
h) Insurance charges		14,62,545.39		10,40,628.76
i) Printing, stationery, photocopy & admin consumables		96,46,734.17		81,43,853.58
j) Postage, telephone and communication charges.		92,50,449.44		90,64,919.45
k) Exhibition, advertisement & publicity expenses		77,55,891.62		1,88,28,089.50
l) Conference/ seminar/ membership fees		66,95,588.46		79,04,677.36
m) Legal, professional fees & honorarium		1,37,51,672.43		65,63,026.00
n) Patent fees		58,31,145.00		90,71,030.00
o) Remuneration to auditors				
Audit fees	4,00,000.00		3,00,000.00	
Out of pocket expenses	64,570.00	4,64,570.00	1,08,092.00	4,08,092.00
p) Hospitality/ entertainment expenses		10,645.00		83,600.00
q) Bank charges		10,01,326.97		17,75,686.97
r) Loss due to foreign exchange translation		34,24,224.51		74,45,568.36
s) Miscellaneous expenses.		2,760.00		7,385.32
TOTAL		**30,01,94,008.61**		**34,84,02,032.49**

SCHEDULE 13-ADJUSTMENTS PERTAINING TO PRIOR PERIOD ITEMS (NET)

(Forming part of the Income & Expenditure Account for the year ended March 31, 2020)

(in Rupees)

Particulars	2020		2019	
	Debit	Credit	Debit	Credit
INCOME				
Income from TOT, Royalty, TSR/FSR & Publications	47,32,000.00	-	3,67,502.40	-
Interest earned	-	-	-	-
Other income	-	5,89,039.49		-
EXPENDITURE				
Establishment expenses	1,94,522.00	-	6,634.00	-
Operational expenses	-	1,70,30,142.74	-	14,35,902.78
Other administrative expenses	55,80,207.58	-	24,46,726.00	-
Depreciation	-	1,99,219.93	-	-
TOTAL	1,05,06,729.58	1,78,18,402.16	28,20,862.40	14,35,902.78
NET TOTAL	**(73,11,672.58)**		**13,84,959.62**	

SCHEDULE 14:-SIGNIFICANT ACCOUNTING POLICIES

(Forming part of the financial statements for the year ended March 31, 2020)

1. Accounting Method

a) The financial statements are prepared on accrual basis of accounting under historical cost convention in accordance with generally accepted accounting principles and standards in India and provisions of the Societies Registration Act, 1860.

2. Use of estimates

a) Preparation of financial statements require estimates and assumptions to be made that effect the reported amount of assets and liabilities on the date of financial statement and the reported amount of revenues and expenses during the reporting period. Differences between actual results and estimates are recognized in the period in which the results are known/materialized.

3. Fixed Assets

a) Fixed Assets are stated at cost less accumulated depreciation and any impairment in value. Cost of fixed assets comprises the purchase price and any directly attributable cost of bringing the asset to its working condition for its intended use.

b) Asset, the individual cost of each of which is Rs 5,000 or less is also capitalized and depreciated in the year of acquisition itself at 100% value reduced by one rupee.

c) Library books are capitalized irrespective of the individual values thereof.

d) Subsequent expenditure related to an item of fixed asset is added to its book value only if it increases the future benefits from the existing asset beyond its previously assessed standard of performance.

e) The Management conducts physical verification of fixed assets at the year end and its reconciliation with financial records. Such exercise is undertaken, taking into account the nature /size of activities of the Centre.

4. Depreciation

a) The provisions of Appendix I to the Income Tax Rules, 1962(The Rules), as amended from time to time, are applied with the exceptions indicated below

i. Assets put to use anytime during the year are depreciated at the full rate prescribed by the Rules.

ii. Library books purchased during the year are depreciated fully in the same year.

iii. Assets, which are sold or discarded or lost or disposed off during the year, do not suffer depreciation for that year.

5. Inventory Valuation

a) Stores and Spares (including machinery spares) are valued at cost. The cost is calculated on weighted average method. Cost comprises expenditure incurred in the normal course of business in bringing such inventories to its location. Such costs are measured at five percent of the value towards freight, forwarding and customs duty charges, wherever applicable. Further,

i. Stores and spares lying in stock are intended to be used in in-house Research & Development.

ii. Sale of spares is not intended, in general. However, obsolete spares are scrapped and sold with the approval of the competent authority.

iii. The spares are acquired at different times for a particular project as they may be needed till the complete obsolescence of the entire technology used for the project.

iv. Since, the stores and spares are not intended to be traded, valuation of the same at Net Realisable Value is not considered practical as the same would be contrary to their nature and the valuation, therefore, is done as stated above.

b) Obsolete, slow moving and defective inventories are identified at the time of physical verification of inventories and, wherever necessary, provision is made for such inventories.

6. Investments

a) Current investments are valued at lower of cost and fair market value.

b) Long Term Investments, including in Joint Ventures, are carried at cost. Wherever necessary, provision is made to recognize decline, other than temporary, in valuation of Long Term Investments.

7. Accounting for Grants-In-Aid

a) Grants-in-aid received from the Government are treated as towards "Corpus / Capital Funds".

b) The Grants-in-aid are treated as accrued when sanction memos are issued by the Administrative Ministry.

8. Revenue Recognition

a) In respect of projects undertaken by the Centre for Telecom Operators and other agencies, the income in relation to these, are accounted for as income, only upon completion of the milestones related to project. Where the milestones/acceptances are not completed, the balances available in the Project account are shown under current liabilities in the balance sheet.

b) Revenue is recognized to the extent that it is possible to estimate/ascertain that the economic benefits will accrue to the Centre and the revenue can be realistically measured. When the Centre is unable to assess the ultimate collection with reasonable certainty, revenue recognition is postponed and is recognized as and when the revenue collection is reasonably certain.

c) Expenses is accrued as and when it is incurred and recorded in the financial statements of the periods to which they relate.

9. Foreign Currency Transaction

a) Foreign currency transactions are accounted at the exchange rate prevailing on the date of transaction and the difference between the date of transaction and payment / receipt /accrual are accounted for as income or expenditure, as the case may be.

b) Monetary Current Assets and current liabilities denominated in foreign currency are translated at the exchange rate as prevailing at the year end and the resultant gain / loss is adjusted to revenue account. Advances paid to foreign suppliers for materials/services are treated as non-monetary assets and consequently are reported using the exchange rate at the date of transaction.

c) Contingent liabilities denominated in foreign currency are translated at the exchange rate as prevailing at the year end.

10. Retirement and other employee benefits

a) Provident Fund contributions are in the nature of defined contribution scheme. The Centre accounts for the monthly contributions towards Provident Fund which is mainly administered through duly constituted and approved Exempted Trust.

b) The Centre operates defined benefit plan for Gratuity to its employees. The costs of providing benefits under this plan are measured on the basis of actuarial valuation at the end of each year using projected unit credit method.

c) Provisions for compensated absences are accounted for based on actuarial valuation using the projected unit credit method at the year end.

11. Adjustments pertaining to earlier years

Adjustments necessitated during the current year pertaining to one or more previous years are treated as prior period items only when the value in each such case exceeds Rs 5000/-.

12. Provisions and Contingent Liabilities

a) The Centre creates provision when there is a present obligation as a result of an obligating event that probably requires an outflow of resources and a reliable estimate can be made of the amount of outflow.

b) A disclosure for a contingent liability is made when there is a possible obligation or a present obligation that may, but probably will not, require an outflow of resources. Where there is a possible obligation or a present obligation in respect of which the likelihood of outflow of resources is remote, as per the view of the Management, no provision or disclosure is made.

SCHEDULE 15:-NOTES ON ACCOUNTS

(Forming part of financial statements for the year ended March 31, 2020)

PART –A: Balance Sheet

1. Fixed Assets

Fixed assets include land at New Delhi measuring 40 acres (same as previous year) which was acquired in 1993 from Government of India. This land has been considered free hold, however, formal conveyancing has not been done in favour of the Centre.

2. Capital work-in-progress

a. It represents cumulative expenditure, incurred since the financial year 2008-09, on proposed housing facility within the C-DOT Campus at New Delhi, amounting to Rs. 72.46 lakhs as at 31.03.2020 (Previous year- Rs.62.53 lakhs).

b. This expenditure under this head will be capitalized appropriately under "Fixed Assets", upon completion of the housing facility.

3. Investments in C-DOT Alcatel Lucent Research Centre (CARC) Private Limited

a. C-DOT Alcatel Lucent Research Centre (CARC) Private Limited is a joint venture company engaged in Research & Development in the field of telecommunications. The Centre's equity participation in the joint venture is Rs.5200 lakhs.

b. The net worth of the said company is fully eroded as the company has accumulated losses. Hence, a provision against the said investment was made under the head "Provision for Bad and Doubtful Investments" amounting to Rs. 5200 lakhs in previous years. Centre, being one of the promoters of the company, is awaiting the directive of the Government on the prospects of the company.

4. Current Assets, Loans, Advances and Deposits

a. Inventory: -

i. Components which are lying in stock for more than 3 years amounting to Rs. 853.89 lakhs as at 31.03.2020 (Previous year Rs. 611.40 lakhs). The Centre has provided an amount of Rs.853.89 lakhs towards disposable stores & spares as at 31.03.2020. In the absence of determination of realizable value, the same will be recognized as and when realized.

ii. The value of components, which were purchased in past years, issued to the indentors and treated as consumed in the accounts of the year of issue, but part of which were returned to the stores during the current year by the indenting groups- Rs. 197.27 Lakhs (Previous year- Rs.70.51 lakhs).

b. Sundry Debtors amounting to Rs. 19138.36 Lakhs as at 31.03.2020 (Previous year Rs.19965.35 lakhs) includes:-

i. TOT, Royalty & Technology support dues amounting to Rs 3187.87 lakhs as at 31.03.2020 (Previous year- Rs.3201.79 lakhs) from one of the licensees is met by the value of land and building at Bangalore belonging to that licensee which was taken over by the Centre in the year 2005.

Awaiting decision of the Nodal Ministry regarding valuation and transfer of ownership of Land and Building at Bangalore from the particular licensee, the amount is yet to be settled.

ii. Dues for technology/field support/other services rendered to Telecom companies amounts to Rs. 10429.14 lakhs as at 31.03.2020 (Previous year- Rs. 11206.27 lakhs). Letters for obtaining confirmation of the amount recoverable are sent to the respective parties. However, in majority of the cases the confirmations are not received back. Most of the recoverable amounts are due from Public sector undertakings and Government organizations. The dues have been taken up for realization during the synergy initiative by Nodal ministry. Pending finalization of such proceedings the management considers the said dues as good for recovery.

iii. Provision for Bad & doubtful debts amounting to Rs. 189.38 lakhs (Previous year- Rs. 189.38 lakhs) towards TOT & Royalty dues of M/s PCL has been retained due to ongoing arbitration proceedings.

c. Loan to C-DOT Alcatel Lucent Research Centre (CARC) Private Limited:-

The aggregate of loans given to C-DOT Alcatel Lucent Research Centre (CARC) Private Limited in previous years amounts to Rs. 1845.79 lakhs. The said company

has accumulated losses and its net worth has fully eroded. Hence, a provision against the said loan was made under the head "Provision for Bad and Doubtful Loan" amounting to Rs 1845.79 lakhs in the previous years. Aggregate of loans after providing for bad and doubtful loans as at 31.03.2020 is Nil (Previous year-Nil).

d. Interest Accrued on loan to CARC Private Limited:-

Interest accrued on loan given to C-DOT Alcatel Lucent Research Centre (CARC) Private Limited as at 31-03-2020 is Rs.598.58 lakhs (same as previous year). From the Financial Year 2011-12, the said company defaulted in paying the interest. However, keeping in consideration the liquid funds available with the said company at the balance sheet date, no provision was made. Nonetheless, the Centre has now made the provision subsequent to the Balance Sheet date for the said amount.

e. Tax Deducted at Source:-

Tax deducted at source receivable pertaining to various years, amount to Rs.1945.30 lakhs as at 31.03.2020 (Previous year-Rs. 2229.20 lakhs) is considered good for recovery. Subsequent to the Balance Sheet date a sum of Rs.1149.45 lakhs and interest of Rs.114.85 lakhs has been realized towards Income tax refund.

5. Contingent Liability

On account of pending legal cases, the amount outstanding is Rs.284.77 lakhs as at 31.03.2020 (Previous year-Rs.284.77 lakhs).

6. Capital Commitments

Capital commitments as at 31.03.2020 amounts to Rs.22.55 lakhs.

PART – B: Income & Expenditure Account

a. Employees' Benefits

i. Gratuity

Net expenditure recognized in the Income & Expenditure account towards Gratuity, using the Actuarial valuation method, based on existing pay and allowances is Rs.1311.20 lakhs (Previous year- Rs.625.71 lakhs). The Gratuity Trust, which is managed by a separate Board of Trustees comprising of employees of the Centre, is responsible to discharge the liability on this account.

ii. Earned Leave (EL)

As per Rules of the Centre, Earned Leave is encashable by serving employees as well as by those leaving the services, either on superannuation or otherwise. Net expenditure recognized in Income & Expenditure account towards leave liability, based on existing pay and allowances, estimated using actuarial valuation method is Rs.1557.60 lakhs (Previous year- Rs.1149.49 lakhs). Accumulated provision as at 31.03.2020 is Rs.7546.05 lakhs (Previous year- Rs. 5985.49 lakhs).

b. Consumption of Components:

i. As per the practice followed consistently, value of consumption is arrived at by reducing the value of closing stock from the aggregate of the values of opening stock and the purchases made during the year.

ii. Accordingly, the value of components consumed during the current year was Rs. 1681.78 Lakhs (Previous year-Rs. 3746.05 Lakhs).

c. Foreign Exchange Fluctuations:

i. The net result out of gains & losses due to fluctuations in Foreign Exchange on account of various transactions during the current year is a loss of Rs. 31.31 Lakhs (Previous year loss- Rs. 62.92 Lakhs).

ii. The gains and losses on account of foreign exchange fluctuations are disclosed in Schedule 9 and 12 respectively.

d. Adjustments Pertaining to earlier years (Net)

It includes income of Rs. (-) 41.43 lakhs (Previous year Rs. (-) 3.68 lakhs) and expenditure of Rs. (-) 114.55 lakhs (Previous year Rs. 10.17 lakhs).

PART – C: General

Previous year's figures have been regrouped or rearranged, wherever necessary, to make them comparable.

Sd/-	Sd/-
G. Mukundan	K. Ramchand
Chief Finance Officer	Executive Director

Acronyms

4G : 4th Generation (wireless communication technology)
5G : 5th Generation (wireless communication technology)
ADN : Application Dedicated Node
ANURAG : Advanced Numerical Research and Analysis Group
ASN : Application Service Node
AT : Acceptance Testing
BBWT : Broadband Wireless Terminal
BSS : Base Station Subsystem
C-GEMS : C-DOT GPON EMS Simulator
CAS : Conditional Access System
CDR : Call Detail Record
CGRAN : C-DOT GSM Radio Access Network
CiSTB : C-DOT interoperable Set-Top Box
CMMI : Capability Maturity Model-Integrated, Shared GSM Radio Access Network
CPE : Customer Premises Equipment
CSC : Common Service Centre
CSF : Common Service Functions
DEAL : Defence Electronics Applications Laboratory
DoT : Department of Telecommunications
DR : Disaster Recovery
DTH : Direct-To-Home
ECSCF : Emergency Call Session Control Function
EMS : Element Management System
eNodeB : Evolved Node B
EPC : Evolved Packet Core
FPGA : Field Programmable Gate Array
FTTH : Fibre-To-The-Home
GIS : Geographic Information System
GPSU : Green Power Supply Unit
ICT : Information and Communication Technology
IEEE : Instiute of Electrical and Electronics Engineers
IIT : Indian Institute of Technology
IM : Intelligence Manager
IMCL : IndusInd Media & Communications Ltd
IMS : Internet Protocol (based) Multimedia Subsystem
IN : Infrastructure Node
IRI : Interception-Related Information
ITI : Indian Telephone Industries
LAN : Local Area Network
LEA : Log and Event Manager
LEMF : Law Enforcement Monitoring Function
LSA : Licensed Service Area
LTE-A : Long Term Evolution - Advanced
LTE : Long Term Evolution (of universal terrestrial radio access network)
M2M : Machine-to-Machine
MAN : Metropolitan Area Network
MAX-NG : Main Automatic Exchange - Next Generation
MAX : Main Automatic Exchange
MHA : Ministry of Home Affairs
MN : Middle Node
MPLS : Multi-Protocol Label Switching
NCR : National Capital Region
NDMA : National Disaster Management Authority
NFV : Network Function Virtualisation
NIC : National Informatics Centre
NOC : Network Operation Centre
NOFN : National Optical Fibre Network
OCN : Optical Core Network
OSI : Open Source Intelligence
OTN : Optical Transport Network
PCB : Printed Circuit Board
PCI : Prime Custodian of Interception
PCT : Patent Cooperation Treaty
PDO : Public Data Office
PMH : Prime Minister's House
PMO : Prime Minister's Office
PSAP : Public Safety Answering Point
PSU : Public Sector Undertaking
PQC : Post Quantum Cryptography
RAX : Rural Automatic Exchange as Access Network
RF : Radio Frequency
SDN : Software Defined Networking
STB : Set-Top Box
STBR : Stackable Terabit Router
Tbps : Terabits per second
TCIL : Telecommunications Consultants India Limited
TDMA : Time Division Multiple Access
TEC : Telecommunication Engineering Centre
ToR : Top-of-Rack
TRAI : Telecom Regulatory Authority of India
VAS : Value-Added Service
VOIP : Voice over Internet Protocol
WDAN : Wavelength-based Distribution and Aggregation Network
WiDHWAN : Wireless Data Connectivity at Home using Wireline Access Network
WiFi : Wireless Fidelity
XGPON : 10 Gpbs Passive Optical Network (TDM/TDMA-based)

Our Bankers

Canara Bank
C-DOT Campus, Mehrauli
New Delhi-110 030

Syndicate Bank
Corporate Finance Branch
6, Sarojini House, Bhagwan Dass Road
New Delhi-110 001

Canara Bank
Electronics City, Phase-1
Hosur Road, Bengaluru-560 100

Central Bank of India
Sona Towers, 71/1, Millers Road
Bengaluru-560 052

Our Offices

C-DOT
C-DOT Campus
Mehrauli, New Delhi-110 030

C-DOT
Electronics City, Phase-I
Hosur Road, Bangaluru-560 100

C-DOT
Field Support Centre, P-108
Ground Floor, Lake Town, Block -A
Kolkata-700 089

Our Statutory Auditors

Jain Chopra & Company
Chartered Accountants
F-12, Second Floor
Bhagat Singh Market
New Delhi -110 001

सी-डॉट
C-DOT

Centre for Development of Telematics

Corporate Office:
C-DOT Campus, Mehrauli,
New Delhi - 110 030, India
Phone: +91 11 2680 2856
Fax: +91 11 2680 3338

C-DOT Campus, Electronics City,
Phase-I, Hosur Road,
Bengaluru - 560 100, India
Phone: +91 80 2511 9001
Fax: +91 80 2511 9601

Website: www.cdot.in Email: cdotweb@cdot.in CDOT_India