Annual Report
2018-19

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

Governing Council:

Chairman
Minister of Communications

Vice Chairman
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 (Technology, 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, 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 Gigabit Passive Optical Network (GPON) 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". 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 Broad Band Wireless Terminal (BBWT) 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.

C-DOT's unflinching determination towards promotion of "Digital Literacy" is well reflected in its unique innovation, GyanSetu, that is capable of extending the benefits of Internet to the illiterate populace of India including the specially abled in an easy and convenient manner thus spurring the socio-economic growth. This innovative solution was conferred with an award of excellence at ITU Telecom World 2015, Budapest, Hungary.

C-DOT is also 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 Transfer of Technology (ToT) 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 during F.Y. 2018-19

C-DOT Achievements for the FY 2018-19 (April 2018-March 2019)

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

◆ Significant progress has been made in security related projects, namely, CMS equipment rolled out in 21 LSAs and operations commenced, SDCN ready for commissioning in MTNL in Delhi and expansion for DRDO in-progress, etc.

◆ **Optical technology -** Field trial completion for new variants of GPON ONTs, development completion for next generation PON i.e. XGS-PON, 100G DWDM system under field trial and offered for TEC validation.

◆ **Routing technology -** trials completed in MTNL network, and PoC for high capacity router is planned in BSNL network.

◆ **Satellite hub baseband system for DEAL -** developed and delivered to the customer.

◆ **High capacity solar power supply system -** ToT process initiated for 2KW System.

◆ **M2M and STB -** M2M network extended lab trial with applications ongoing. Readiness of hybrid DTH Set-Top Box (STB) for trial in the field.

◆ **Green power supply -** ToT process also initiated for 2KW System.

◆ **NGN technology -** More than 5 million lines migrated in BSNL network.

◆ **Wi-Fi technology -** under field implementation.

◆ **Transfer of technology (ToT) completed during year -** 14 nos. for various technologies and total ToTs as on date is 96 nos.

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

1.1.1 SECURITY RELATED PROJECTS

◆ **Centralized Monitoring System (CMS) -** for lawful interception and monitoring - a National Roll-out Project put into operations. The CMS project is practically complete with equipment rolled out in 21 LSAs and operations commenced with 35 LEAs (in LEMF or terminal mode) with onboard CMS and 57 LEAs in the process of onboarding CMS LEMF

◆ **Secure and Dedicated Communication Network (SDCN) -** Ready for commissioning in MTNL Delhi Network. For DRDO in-progress with completion of Factory Acceptance Testing (FAT) for VoIP CPE and Aggregator Expansion of SDCN Network, FAT for Router in-progress.

◆ **ISP Monitoring System -** under field deployment. During the year, ISP gateway hardware installed at 11 additional locations and handed-over to LEAs. Cumulatively, ISP monitoring solution has been deployed and in-operation at more than 120 locations across country.

◆ **Centre of Excellence for Lawful Interception (CoE) -** Development of advance technologies for social networking and analysis, image processing, quantum safe cryptography, etc. to fulfil the requirements of LEAs are in-progress. Major activities completed during the year include, software development for social networking websites (YouTube, Twitter, Facebook, LinkedIn, etc.), basic framework for social website analysis tool, internal validation for face detection & recognition under control environment and validation ongoing for lattice-based PQC algorithm for phone and IP encryptor.

1.1.2 OPTICAL TECHNOLOGIES

◆ **OCN -** DWDM-based 100G Optical Transport Network (OTN) system - under field trial in BSNL at Chennai & offered for TEC validation.

◆ Development has also progressed for OTN switch with completion of hardware and software development for cross-connect capacity of 1.6 Tbps.

- **XGS-PON, next generation PON -** development completed and under testing.

- Field trial including TEC certification completed for new variant of GPON ONTs, namely, Titli with dying gasp, Ring ONT, and ONT with RF.

- Pilot trial completed for 4-port OLT in CSC at Noida, UP and it is in-operation in the field.

1.1.3 SWITCHING AND ROUTING TECHNOLOGY

- **Routing technology -** technology trial completed in MTNL network. Deployment of high capacity routing technology (with capacity upto 6 terabit depending upon field configuration / requirement) in BSNL network, is planned for which technical proposal submitted for its PoC.

- **High speed routing system -** Development in-progress with porting of software on 100G Ethernet interface reference board.

- **LAN, MAN enterprise and data centre segment -** L3 switch implementation for 24-port has been completed. Development completed for 48 port integrated L2 / L3 switch and software porting on new 24-port configuration hardware is ongoing. Development is in-progress for medium capacity ToR switch.

- **Customised router for DRDO ANURAG -** PCB fabrication and assembly in progress and software integrated on the standard multicore processor reference platform. Software integration ongoing on C-DOT designed hardware.

1.1.4 SATELLITE-BASED TECHNOLOGIES

- **Satellite hub baseband system for DEAL -** Carrier-grade hub baseband system with redundancy developed and delivered to the customer.

- **Digital Video broadcasting (DVB) -** S2 Hub Baseband System -Simulations completed for DVB-S2 modulator and MF-TDMA demodulator. Video broadcasting successfully implemented in transmit path (downlink from hub to terminal).

1.1.5 POWER-EFFICIENT AND GREEN TELECOM TECHNOLOGIES

- **High capacity solar power supply system -** 75W, 125W, and 256W systems, ready for manufacturing. ToT process also initiated for 2KW System. Lab Testing completed for higher capacity 5KW system.

1.1.6 TELECOM SERVICES AND APPLICATIONS

- **M2M communication -** Validation of M2M system nodes (comprising of ADN, ASN, IN and MN) with CSFs is in progress. Extended lab trial for M2M network with applications ongoing

- **CiSTB -** STB for cable segment, under field trial at Mumbai in IMCL cable network. DTH hybrid STB validation completed & Identification of site for field trial in-progress.

1.1.7 FIELD IMPLEMENTATION OF DEVELOPED PROJECTS

- **NGN -** C-DOT MAX technology under migration to NGN. Migration completed at 2-sites per circles, as per planned, thereby more than 5 million lines have been migrated in BSNL network.

- **C-DOT Wi-Fi technology -** Field roll-outs are in progress for solar Wi-Fi for 5000 villages of CSC, and Wi-Fi systems for Navy and Army. Planning for pan Navy deployment commenced. PoC completed for KSWAN, Mysore.

- **LTE enhancements, customization and trial -** LTE system comprising of eNodeB and EPC has been installed in MTNL, Delhi for PoC and trial.

- **Solar RTS -** Roof-top solution using Photovoltaic DC generator (PVDG), Supply, Installation, Texting & Commissioning (SITC), completed for 600 KWp at C-DOT Campus, Delhi and testing of 557 KWp at C-DOT Campus, Bengaluru ongoing.

2. Technology Commercialization:

S. No.	Strategic partner	Executable Project	Purpose
A	**MoUs and project agreements**		
1.	IIT, Bombay	4G & 5G technology Development	Joint collaborative research projects in the areas of 5G & 4G
2.	Ministry of Communication, Republic of Ghana	4G & 5G technology Development	Development of a reliable and cost effective world class communications infrastructure and services in Ghana
3.	CSIR CEERI, Pilani	Development of 5G products and services	Mm-Wave technologies, Last Mile connectivity, High data rate communication, Edge Automation Platform, etc.
4.	IIT Roorkee	5G technology and related communication systems	5G technology and related communication system
5.	National US India Chamber of Commerce, USA	5G technology and related communication systems	Manufacturing and delivery of innovative and advanced telecom products / services to customers and service providers
6.	Federal Ministry of Telecom, Nigeria	5G technology and related communication systems	Synergizing Indian R&D solutions and services to customers and service providers in Nigeria with the support from 'Telesuprecon FZE (and Associate Companies)'
7.	IIT, Madras	5G technology and related communication systems	High Frequency RF Modules, Air Interface layer-1 algorithm and optimization, Massive MIMO baseband algorithm
8.	IIT, Ropar	Post Quantum Cryptography	Commercial Hybrid Post-quantum software implementation in VoIP, IP Encryptor along with an FPGA based post-quantum implementation on an FPGA reference board
9.	IIT, Delhi	Centre of Excellence Program	Method and Apparatus for Multilingual and multi modal keyboard search in mixlingual speech corpus
10.	Telecom Cambodia	C-DOT's wireless, optical products and software solutions	Synergizing Indian R&D efforts in telecommunication with delivery and implementation of C-DOT's innovative and advanced telecom solutions and services to customers and service providers in Cambodia

S. No.	Strategic partner	Executable Project
B	ToT agreements with manufacturers	
1	CSC Wi-Fi Choupal	PGON - Chatur Damini, ONT 11 and Titli
2	Kaynes Technology India Pvt. Ltd.	PDO
3	Kaynes Technology India Pvt. Ltd.	BBWT (HSAP + Solar)
4	Kaynes Technology India Pvt. Ltd.	GPON-OLT5X, Chatur Damini, ONT 11, Titli, Mini OLT
5	BEL Kotdwara	BBWT (Solar Wi-Fi + HSAP)

3. Campus Infrastructure

After years of effort, C-DOT campus Infrastructure group had succeeded in achieving self-sufficiency in meeting water requirements by boring two tube wells after getting necessary statuary clearances. Delhi Jal Board water-connection for bulk water supply was also achieved as an additional source of water 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 already been received. C-DOT Board has also approved a budget of 5 crores to initiate the work. Architect has submitted the detailed PERT, estimate & draft tender for the project. Empowered committee is doing necessary evaluation to finalize the tender.

To achieve eco-friendly campus, 1.157 MWp Roof Top Solar (solar RTS) system installed at C-DOT campus in partnership with M/s Central Electronic Limited, India. The project had been installed for 600 KWp and 557KWp at Delhi and Bengaluru campuses respectively which is running successfully.

Organizational Processes and Practices

**Organizational processes and practices for sustenance of CMMI
Maturity Level 5 and initiation of P-CMM implementation**

The organisation had already been successfully appraised in 2014 for CMMI Maturity Level 5, and after expiry of validity period, successfully re-appraised in 2017, for its processes and practices related to development projects.

During FY 2018-2019, sustenance and further improvement of high maturity level practices are continuing and are being assessed through regular internal audits. Preparations for next re-appraisal scheduled in 2020 has already started.

Implementation of P-CMM practices and journey towards appraisal for the same were also initiated in FY 2018-2019. After initial orientations of the stakeholders, a formal Gap Analysis by external experts has been conducted, and the reported gaps are being filled to meet the requirements of P-CMM Level 2.
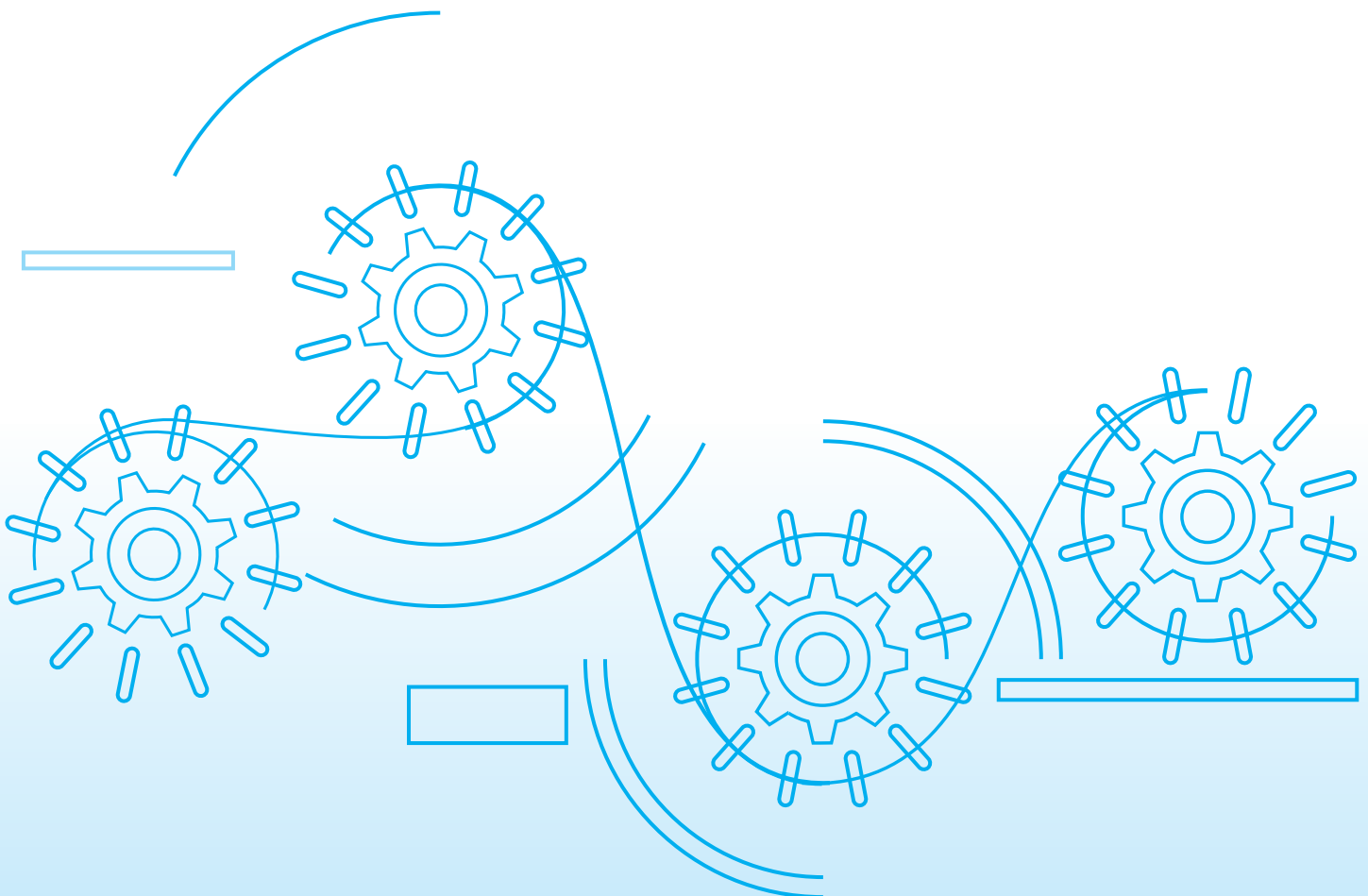
Intellectual Property Rights

Details of Patents Granted in FY 2018-19

S.No.	Title	Country
1.	A method and an information appliance device For preventing security breach in information appliance device	Canada
2.	Gesture Based Human Machine Interface Using Marker	USA, UK
3.	A Communication System For Managing Leased Line Network With Wireless Fall-back	India

Details of Patents Filed in FY 2018-19

S.No.	Title	Country
1.	A RapidIO® network for achieving load balancing	India, PCT
2.	System And Method For On Board Programming Of Configurable Logic Devices	India
3.	A Learning-Based Method And System For Configuring An Optical Time-Domain Reflectometer In A Gigabit Passive Optical Networks	India, PCT
4.	System For Personalization Of A Set Top Box	India
5.	System And Method To Monitor Quality Of Service At A Set Top Box	India
6.	A System For Enabling Voice Communication Over Long-Range Using Lora Modulation In Indian Disaster Scenario	India
7.	Method For Equipment Selection In Generalized Multiprotocol Label Switching	India
8.	Real-Time Distributed Engine Framework Of Ethernet Virtual Connections	China, Japan, UK, USA
9.	Method For Equipment Selection In Generalized Multiprotocol Label Switching	USA
10.	Secure Interoperable Set Top Box Through Reverse OTP	China, Canada, UK, USA
11.	GIS Based Centralized Carbon Footprint Monitoring System And Method Thereof	China, UK, USA, Kenya, Nigeria, South Africa
12.	System And Method For Network Traffic Slicing	China, USA, Kenya, Korea, Europe
13.	Event Generation And Management System	PCT
14.	Dynamic Channel Selection In IEEE 802.11 Networks	PCT
15.	Method, System And Apparatus For Multilingual And Multimodal Keyword Search In A Mix lingual Speech Corpus	PCT

Designs Filed in India

S.N.	Title
1.	4 Port Office OLT
2.	WAP WiFi Router
3.	XGPON ONT

Trademarks Registered in India

S.N.	Trademark Name/ Logo
1.	C-DOT
2.	CGRAN

Trademarks Filed in India

S.N.	Trademark Name/ Logo
1.	C-TEC

Copyrights Granted in India

S.N.	Title
1.	C-DOT GPON EMS Simulator
2.	Graphical User Interface For Control, Configure And Monitor Multi Radio Based C-DOT BBWT System
3.	C-DOT Specific MIBS Based SNMP Agent For BBWT System
4.	PDO APP
5.	Software For Public Data Office (PDO),
6.	Link Management Interface For Communication Between LCT And GPON Equipment
7.	NOFN-SLA
8.	NOFN-DCNMS
9.	Dashboard Framework
10.	M2M EMS
11.	Element Management System For Evolved Node B (JAVA in CD)
12.	Node Configuration Tool
13.	DWDM EMS
14.	G-PON EMS

Copyrights Filed in India

S.N.	Title
1.	Graphical User Interface For Control, Configure And Monitor Multi Radio Based C-DOT BBWT System
2.	C-DOT Specific MIBS Based SNMP Agent For BBWT System
3.	PDO APP
4.	Software For Public Data Office (PDO),
5.	Link Management Interface For Communication Between LCT And GPON Equipment
6.	NOFN-SLA
7.	NOFN-DCNMS
8.	Dashboard Framework
9.	M2M EMS

Details of Paper Publications

S.No.	Title	Publication / conference details
1.	Isolating and Reporting Fluctuation Remotely with Preventing Servers from Trap Load	3rd International Conference for Convergence in Technology (I2CT), Pune, Maharashtra, 6-8th April 2018
2.	A RapidIO-Ethernet System Architecture for TDM-based Satellite Receiver	2018 International Conference on Computer, Information and Telecommunication Systems (CITS2018), Colmar, France July 11-13 2018
3.	Passive Optical Networks: Review and Road Ahead	IEEE TENCON 2018 - 2018 IEEE Region 10 Conference, Jeju Island, Korea, October 28-31, 2018
4.	Synchronization of Bursty QPSK Narrowband Satellite Receiver having large CFO-An Implementation on C66x TI DSP	18th International Conference on Electronic, Information & Communication 2018 (ICEIC 2019), Auckland, New Zealand January 22-25 2019
5.	C4.5 Decision Tree Machine Learning Algorithm based GIS Route Identification	The 10th International Conference on Ubiquitous and Future Networks, 3rd July'18 to 6th July'18, Prague, Czech Republic
6.	oneM2M Compliant Sensor Network for Smart farming & Cellular Radiation Monitoring	IEEE 3rd International Conference For Convergence in Technology I2CT 2018, Pune April 6-8, 2018
7.	Configurable User Interface - A perspective from Interoperable STB	IC4T-2018, Lucknow, UP, India 25-27 Oct, 2018
8.	IP Trends in 5G Technologies	First IP & Innovation Researchers of Asia Conference, Ahmad Ibrahim Kulliyyah of Laws, International Islamic University Malaysia, 31 January-1 February 2019
9.	LoRaWAN Network Capacity for Practical Network Planning	2019 URSI Asia Pacific Radio Science Conference, New Delhi, 09-15 March 2019
10.	DSP Implementation of OQPSK Baseband Demodulator for Geosynchronous Multichannel TDMA Satellite Receiver	International Congress On Information And Communication Technology (ICICT -2019) February 25-26 2019 London, UK
11.	Suppression of Common and Differential Component of Crosstalk Coupling onto the Differential Line and Field analysis of the Crosstalk	2018 IEEE Symposium on Electromagnetic Compatibility, Signal Integrity and Power Integrity (EMC, SI & PI) 30 July-3 Aug. 2018, Long beach, USA
12.	Throughput Improvement by using Dynamic Channel Selection in 2.4GHz Band of IEEE 802.11 WLAN	ICUFN 2018, Prague, Czech Republic, 3-6 July, 2018

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.

The Innovators in Delhi were felicitated by Hon'ble chief guest, Shri Raghvendra Saha, Senior Adviser, Confederation of Indian Industry and Shri Anil Kumar Sanghi, Joint Secretary, National Disaster Management Authority (NDMA), India on 10th July 2018.

The Innovators in Bengaluru were felicitated by Hon'ble chief guest, Prof. K P J Reddy, Dept. of Aerospace Engineering, Indian Institute of Science, Bengaluru on 28th June 2018.

The IPR session on Determinants of Patent Quality was aimed at increasing the quality of patents. Prior art search and patentability was explained with case studies. This session was conducted by Ms. Priya Chauhan, Patent Associate from M/s Lall, Lahiri & Salhotra at C-DOT Delhi and Bengaluru to clarify all the major queries that arise in an Inventor's mind.

Knowledge Management

Training

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 2018-2019 were arranged are IP, MPLS, Neural Networks, MS-Excel, Cloud Computing, GST, Mobile Broadband QoS, 5G and Emerging Technologies, Public Procurement, E-Procurement & GEM, Cryptography, various wireless technologies, Hadoop/ Big Data, Block Chain, CMMI processes & PCMM, DMF DFT, EMI/EMC, Configuration management, Value engineering and reliability,

Legal aspects, Introduction to customer excellence, 3D Solid works, process management and soft skill trainings.

Executive training was also a part of this year's training program. During this the participants attended soft skill workshops on topics like Leadership Culture, Understanding Self & Interpersonal relationships, Leading Self, Being Happy: Body, Mind & Soul, Developing Effective Interpersonal Relationships, Creating Culture of Collaboration, Pride & Time management Creative problem solving, work ethics, customer sensitivity for internal and external customers. Hands on Excel training was also part of the training.

The training for Senior Research Engineers (UTTKARSHAN) was a part of this year's training schedule, wherein the participants attended the Soft skill training programs, leadership skills, ethics, etc.

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 25332 technical books, 3405 Hindi books and over 82 periodicals and magazines besides country's 13 leading Newspapers and Newsletters. For the year 2018-2019 a total of 163, 44 Hindi books and 3 online databases 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.

Institutional Memberships

To participate in relevant and international networks for exchange of information and for sharing of information resources C-DOT has taken memberships of more than 20 leading professional associations.

These memberships enable C-DOT employees to promote their professional development, increase knowledge in their field and expand networking possibilities. This also helps them to remain updated with the latest industry innovations, research and trends.

C-DOT holds the following memberships:

CORPORATE MEMBERSHIPS OF C-DOT

Sr.	Name of the Memberships	Current Period	Type of Membership	Related Documents
1.	All India Management Association (AIMA) www.aima-ind.org	April 2018 -March 2019	Institutional Membership Since 1994	AIMA Documents Directory
2.	Asia Pacific Telecommunity (APT) www.aptsec.org	January 2018 -Dec 2018	Affliate Membership since 2002	–
3.	Asia Pacific Network Information Centre (APNIC) www.apnic.net	November 2017- Oct 2018	Associate Membership Since 2005	–
4.	Current Science Association www.currentscience.ac.in	Life time Membership	Institutional Membership since 2016	–
5.	Delhi Management Association (DMA) www.dmadelhi.org	May 2018 - April 2019	Patron Membership Since 1996	DMA E-News Issues/ Reviews Directory
6.	Electronic Industries Association of India (ELCINA) www.elcina.com	May 2018 - April 2019	Associate Membership Since 2010	–
7.	Electronics & Computer Software Export Promotion Council (ESC) www.escindia.in	April 2018 - March 2019	Association Since 2009	–

Sr.	Name of the Memberships	Current Period	Type of Membership	Related Documents
8.	European Telecommunication Standards Institute (ETSI) http://www.etsi.org	Jan 2018 - Dec 2018	Associate Membership Since 1999	–
9.	Fiber To The Home (FTTH) Council http://www.Gthcouncilap.org	Jan 2018 - Dec 2018	Silver Membership Since 2010	–
10.	3GPP http://www.3gpp.org/	April 2018 -March 2019	Individual Membership	–
11.	India Electronics & Semiconductor association (IESA)http:// www.iesaonline.org	April 2018 -March 2019	since 2013	–
12.	Institute of Directors (IOD) http://www.iodonline.com	November 2017-October 2018	Institutional Membership Since 2015	–
13.	Institution of Electronics and Telecommunication Engineers (IETE) http://www.iete.org	Life time Membership	Organizational Membership Since 2010	–
14.	Internet Protocol Television Society (IPTV) Broad Band India Forum http://www.iptvforum.org.in	April 2018 -March 2019	Corporate Membership Since 2015	–
15.	National Association of SoGware and Service (NASSCOM) www.nasscom.in	April 2018 -March 2019	Associate Membership Since 1996	–
16.	OneM2M http://www.onem2m.org/	April 2018 -March 2019	Individual Membership	–
17.	Pacific Telecommunication Council (PTC) India Foundation www.ptcif.org	April 2018 -March 2019	Corporate Membership Since 1997	–
18.	PICMG http://www.picmg.org	July 2018 - June 2019	Associate Membership Since 2015	–
19.	Telecom Equipment & Services Export Promotion Centre (TEPC) http://www.telecomepc.in	April 2018 -March 2019	Since 2015	–

Sr.	Name of the Memberships	Current Period	Type of Membership	Related Documents
20.	Telecommunications Standards Development Society, India (TSDSI) http://www.tsdsi.org/	April 2018-March 2019	Institutional Membership Since 2014	–
21.	TM Forum http://www.tmforum.org/	May 2018 -April 2019	Corporate Membership Since 2017	–
22.	WiFi Alliance http://www.wi-fi.org	JAN 2018- Dec 2018	Regular Membership since 2016	–
23.	Wireless Broadband Alliance http://www.wballiance.com/	Jan 2018 - Dec 2018	General Member since 2016	–
Library Memberships				
24.	American Centre http://amlibindia.state.gov.	March 2017 -April 2018	Organizational Membership	–
25.	British Council www.britishcouncil.in/	April 2017 - May 2018	Access 10 Membership	Library Membership Documents Directory
26.	Delnet http://delnet.nic.in	May 2017- June 2018	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-2018 to 31-Mar-2019			Strength as on 31-03-18
		Recruited	Resigned	Completed	
Graduate	54	52	24	28	0
Diploma-Technical	0	0	0	0	0
ITI	03	03	0	03	0
Total	**57**	**55**	**24**	**31**	**0**

Business Promotion

1. Field support of MAX continued for BSNL on PAN-India basis as per signed MoU.

2. Proposal for Intelligence Manager has been submitted to various LEAs. Purchase Order received from Signaling Intelligence for implementation of the solution at three sites.

3. Purchase Order received from TEC for development of Mandatory Testing and Certification of Telecom Equipment (MTCTE) Portal.

4. Proposals submitted for Samvaad App to various organizations including BSNL, PGCIL, MP Police etc.

5. Proposal for IMS Solution submitted to MTNL.

6. Field trial of 100 G DWDM successfully completed in BSNL Network at Chennai and proposal submitted to BSNL for absorption of the system.

7. Purchase orders (2 Nos.) received from BEL for supply of Routers and Switches.

8. Purchase order received from TEC for supply and commissioning of Wifi equipment.

9. Proposal submitted to BEL for realization of IP exchange'.

10. Techno commercial Proposal submitted to NDMA for CAP compliant Geo Intelligence based EWP.

11. Proposal submitted to CSC for phase III of Wifi project.

12. Proposal submitted to NDMA for PCR solution.

13. Proposal submitted to TCIL for Digital Village in CLMV countries.

14. Proposal submitted to NAIR (RailTel) Campus in Vadodara, Gujarat for Wi-Fi implementation.

15. Proposal submitted to ALTTC Ghaziabad (BSNL) for Wi-Fi implementation.

16. Conducted Samvaad POC in PGCIL and after its successful completion, submitted Techno commercial proposal for the same.

17. Proposal submitted to TEC for supply of active equipment for up-gradation of LAN.

18. Purchase Order received from SPIC, DRDO for the supply of Network Elements.

19. Proposal submitted to DRDO for the supply of Access Switches.

20. Proposal submitted to Ministry of External Affairs (MEA) for VoIP Telephony Solution.

Awards Received

1. My India WiFi India 2018

A conference named **"My India WiFi India"** was organized by DigiAnalysis on 6 Sep,2018 at Imperial Hotel, New Delhi. C-DOT was conferred with three awards. The first award was **"Best Make in India WiFi Company"**, the second being **"Best WiFi Innovation"** which was given to Balloon WiFi. Apart from this Mr. Vipin Tyagi, Executive Director, C-DOT was honored with the **"WiFi Leadership Award".**

2. ELCINA Awards 2018

C-DOT received two prestigious awards on 5 July in the Strategic Electronics Summit organized by ELCINA and held at The Lalit Ashok, Bengaluru on 5 and 6 July,2018. ELCINA "**defennovation Awards**" are organized each year to celebrate and honor exemplary contributions in the field of Strategic and Space Electronics. C-DOT was honored with First Prize in the **"Excellence in R&D"** category and Second Prize in the **"Excellence in Indigenization" category.**

3. AEGIS Graham Bell Awards 2018

C-DOT BAMBOO Wi-Fi won the award in the category of Innovative Telecom Product at the 9th Edition of AEGIS Graham Bell Awards hosted by Government of Goa held on 1 February 2019 at Panaji, Goa. Aegis Graham Bell Awards is an initiative of Aegis School of Business, Data Science, Cyber Security and Telecom as a tribute to the father of the telephony, Sir Alexander Graham Bell. The Award is organized with support of the Cellular Operators Association of India (COAI), and Telecom Centres of Excellence (TCOE), Convergence India and KPMG as knowledge partner.

4. International Award at Wireless Broadband Alliance (WBA), London

C-DOT has won the most prestigious International Award at Wireless Broadband Alliance (WBA) in the category "Best Wireless Deployment in Rural or Remote Areas Award". The award was conferred on C-DOT w.r.t the Digital Village (Rohta block of Meerut district) through WiFi solution.

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 2018-2019, C-DOT has signed a total of 11 ToTs, covering existing technologies/ products. Of these 11 ToTs, 9 were signed with private sector manufacturers and 2 with CPSUs. As on 31st March 2019, a total of 93 ToTs were signed for 26 Technologies, with 25 different Licensees. C-DOT, through its ToT, has supported bulk manufacturing for mass deployment of its GPON, STBR, BBWT, MAX-NG and ANRAX technologies, through working very closely with the central public sector undertakings like M/s BEL, M/s ECIL and M/s ITI Ltd. C-DOT MAX-NG technology deployment extends the life of its indigenously developed switches in the BSNL network. 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 like M/s UTL and M/s Tejas Networks Ltd. and considerable amount of equipment has been deployed in network while efforts are made to complete the deployment. 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 Kaynes Technology, M/s Cyient Ltd 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. C-DOT interoperable Set Top Box (CiSTB) [an initiative of TRAI] was also promoted during this period.

EVENTS 2018-19

APRIL 2018
- DEFEXPO 2018..

MAY 2018
- World Telecom Day and Information Society Day 2018

JULY 2018
- Strategic Electronics Summit 2018

AUGUST 2018
- IEEE ED's visit to C-DOT
- C-DOT's 35th Foundation Day Celebrations

SEPTEMBER 2018
- C-DOT at ITU Durban
- C-DOT at India ASEAN ICT Expo 2018, Hanoi, Vietnam

OCTOBER 2018
- India International Science Festival 2018, Lucknow
- India Mobile Congress 2018

NOVEMBER 2018
- ITE.Biz 2018

DECEMBER 2018
- IICI 2018

JANUARY 2019
- Indian Science Congress 2019
- M2M + IoT Forum
- Convergence India 2019

FEBRUARY 2019
- India Telecom 2019
- International Colloquium on Ethics and Governance of Autonomous AI Systems
- Mobile World Congress 2019

MARCH 2019
- C-DOT visits Cambodia's Telecommunications Ministry

1. DEFEXPO 2018

C-DOT participated in the 10th edition of DEFEXPO 2018 – an international land, naval and internal homeland security systems exhibition which was held in Chennai from 11-14 April at Thiruvidanthai, Chennai, Tamil Nadu, India. More than 30 countries showcased their defence prowess during the expo.

2. World Telecom Day and Information Society Day 2018

World Telecommunication Day is being celebrated annually on 17 May since 1969, marking the founding of ITU and the signing of the first International Telegraph Convention in 1865.

C-DOT as per direction of Department of Telecom celebrated World Telecom Day and Information Society day on 17 May 2018 in C-DOT Bengaluru and Delhi.

This year the theme was "Enabling the positive use of Artificial Intelligence for all".

C-DOT Bengaluru had invited Dr. V Sridhar from IIIT Bengaluru for a talk on "Enabling the positive use of Artificial Intelligence for All".

3. Strategic Electronics Summit 2018

The 9th edition of Strategic Electronics Summit (SES 2018)-Defence & Aerospace, was held on 5 and 6 July, 2018 at The Lalit Ashok Hotel, Bengaluru. The last eight editions of SES from 2010 to 2017 successfully brought Industry, Defence Establishment & Government together and this platform is growing year on year.

8th edition SES 2018, was inaugurated by Dr. V. K. Saraswat, Member, Niti Aayog, Govt. of India in the presence of Mr. Sanjay Kumar Rakesh, Jt. Secretary, MeitY, Govt. of India, Major General MJS Syali, ADG EME (B), IHQ of MoD (Army) & Rear Admiral Atul Khanna, Asst. Chief of Material, Indian Navy as well as many dignitaries from the industry. The program was attended by over 400 delegates participating in the Conference and Exhibition which witnessed keen interest from large Defence buyers including the Defence Officials.

C-DOT exhibited its various technologies and products including GPON, WiFi technologies and Gyansetu. C-DOT was also honored with First Prize in the "Excellence in R&D" category and Second Prize in the "Excellence in Indigenization" category during the event.

4.   IEEE ED visits C-DOT

Stephen P Welby, Executive Director and Chief Operating Officer, IEEE along with Harish Mysore, Sr. Director - India Operations, IEEE visited C-DOT campus in Delhi on 1 August, 2018, where they were introduced to C-DOT products like GPON, GyanSetu and many more.

5. C-DOT's 35th Foundation Day Celebrations

C-DOT celebrated its 35th Foundation Day on 28-29 August, 2018. This year too, in continuation of its tradition, C-DOT held a technical conference as part of "GB Meemamsi Lecture Series 2018", at New Delhi and Bengaluru offices, wherein several telecom veterans and academicians from around the world including some distinguished professors from universities of UK, USA and IITs shared their intriguing experiences and discussed innovative ways to address the numerous issues and challenges

faced by various stakeholders in the fast-changing Telecom Industry, in India and worldwide. The inaugural session was graced by the esteemed presence of Smt. Aruna Sundararajan, Secretary, Department of Telecom and Chairman, Telecom Commission, GoI, and other Members of Telecom Commission. The event also witnessed the official launch of C-DOT's latest innovations - "DWDM - 80Channel" and "KYM - Know Your Mobile" app as well as the "5G India Website".

6. C-DOT at ITU Durban

C-DOT participated in 4th BRICS Communication Ministers Meeting on 13-15 September in Durban, South Africa, represented by a high-level team comprising of Executive Director, Director-I and Head Marketing as Business Delegates. This 3-day programme had Business Dialogue, B2B Meetings and related discussions. C-DOT, being a pioneer R&D organization of DoT,

MoC played an important role in contributing to the delegation and sought possible collaboration with its BRICS counterparts.

On 14th September, Mr. Vipin Tyagi, Executive Director, C-DOT addressed BRICS Business teams, representative industries and SMEs/MSMEs of South Africa on the Role of Indian R&D and specifically C-DOT products and their ToT (Transfer of Technology) for cost-effective telecom & IT manufacturing. He also stressed the need for mutual co-operation, interactions and building a manufacturing ecosystem.

7. C-DOT at India ASEAN ICT Expo 2018, Hanoi, Vietnam

C-DOT participated in India ASEAN ICT Expo 2018 organised by Ministry of Information & Communication, Vietnam and Telecom Equipment & Services Export Promotion Council (TEPC) at Hanoi, Vietnam during 27-28 Sep 2018. The theme of the event was

"Digital Connectivity in the Industrial Revolution 4.0". C-DOT demonstrated its indigenous Telecom solutions and also participated in the plenary sessions and B2B meetings with ASEAN counterparts.

8. India International Science Festival 2018, Lucknow

C-DOT participated in Mega Science, Technology & Industry Expo at the 4th edition of India International Science Festival 2018 organized by M/o Science & Technology in collaboration with M/o Earth Sciences during 5-8 October 2018 at, Lucknow, Uttar Pradesh. C-DOT exhibited various technologies and products including GPON, WiFi technologies and Gyansetu. The event witnessed participation from the young scientists/ researchers/ scholars from abroad and within the country.

9. India Mobile Congress 2018

C-DOT participated in India Mobile Congress 2018 organized during 25- 27 October 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.

10. ITE.Biz 2018

Department of IT & BT, Govt. of Karnataka as a part of the various initiatives taken to support the innovation ecosystem in Bengaluru organized ITE.biz 2018 which focussed on 'Innovation and Impact'.

The event was jointly organised by the Dept. of IT & BT, Govt. of Karnataka and Software Technology Parks of India (STPI) Bengaluru. It was held from 29 Nov to 1 Dec, 2018 at the Palace Grounds, Bangalore. C-DOT exhibited its products during this three-day exhibition and gathered huge audience to witness the demonstration of its indigenous capabilities.

11. IICI 2018

The Institution of Electronics and Telecommunication Engineers (IETE) is India's leading recognized professional society devoted to the advancement of Science and Technology of Electronics, Telecommunication & IT founded in 1953.

The first edition of IETE International Conference India (IICI), on the theme - Technological Advances & Applications in IOT, Data Analytics, Big Data & 5G, was held on 14-15 December 2018 in Bangalore where C-DOT demonstrated its indigenous technologies and solutions.

12. Indian Science Congress 2019

C-DOT participated in 106th Indian Science Congress 2019 during 3-7 January 2019 at Lovely Professional University,

Phagwara, Jalandhar, Punjab. The event was inaugurated by Hon'ble Prime Minister of India. C-DOT exhibited various technologies and products including optical, wireless, M2M and IOT solutions.

13. M2M + IoT Forum

Sixth edition of M2M + IoT Forum was held from 14-15 January 2019 at Indian Habitat Centre, New Delhi. India's policy makers,

regulators and the industry leaders were present at the event to chart out the vision ahead in the area of Machine-to-Machine (M2M) and Internet of Things (IoT). C-DOT demonstrated its capabilities in M2M and Mr. Vipin Tyagi, EDR, C-DOT delivered a special address during the event.

14. Convergence India 2019

C-DOT participated in Convergence India 2019 held at Pragati Maidan, New Delhi from 29- 31 January 2019. Various C-DOT technologies were demonstrated at the event and live demonstration of the products were appreciated by visitors.

15. India Telecom 2019

India Telecom 2019- An Exclusive International Business Expo, was organized by TEPC (Trade and Export Promotion Centre) at Shangri - La's Eros Hotel, New Delhi, India from 11-12 February 2019 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.

16. International Colloquium on Ethics and Governance of Autonomous AI Systems

The first ever 'International Colloquium on Ethics and Governance of Autonomous AI Systems' was held on 18 & 19 February 2019 at India International Centre, New Delhi. Academicians/Researchers

from IITs, IISc, IIITs, C-DOT, Experts from Technology companies presented their thoughts at the interactive thematic sessions. Mr. Vipin Tyagi, Executive Director of C-DOT also delivered a talk in the inaugural session. C-DOT exhibited its AI Solutions like Face Recognition, Object Detection and other similar solutions.

17. Mobile World Congress 2019

GSMA Mobile World Congress 2018 was held from 25-28 Feb 2019 in Barcelona, Spain. TEPC had invited C-DOT to participate in the Mobile World Congress 2019.

18. C-DOT visits Cambodia's Telecommunications Ministry

A delegation consisting of senior officials of DoT, Executive Director-C-DOT and Head Marketing C-DOT visited Cambodia on 18 March 2019. A MoU and a non-disclosure agreement were inked with the Ministry of Posts and Telecommunications, Cambodia and C-DOT aimed at boosting the ICT and telecommunications sector in Cambodia, including the creation of 'smart villages' in the Kingdom. A separate MoU was signed between C-DOT and Telecom Cambodia, addressing the deployment of advanced telecommunications technology and wireless solutions in rural areas.

HR Initiatives at C-DOT

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 last financial year, of the total employees promoted to higher grades 27% 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 Bengaluru 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.

Employees' 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. Staff members (and their families) With respect to C-DOT Group mediclaim policy the staff in EI grade and below have a coverage of 3.5Lakhs and above and staff in EII grade and above have a coverage of 5Lakhs and above (7.5Lakhs and 10Lakhs). 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 in C-DOT.

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, 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 programmes were conducted with help of two schools, namely, Rajkiya Sarvodaya Kanya Vidyalaya, Sultanpur and Sardar Patel Vidya Niketan, Mandi Gaon, Delhi:

◆ Training on cleanliness and personal hygiene was imparted to the contractual staff

◆ With the involvement of students from Sardar Patel Vidya Niketan, Mandi Road; C-DOT conducted one street play or 'Nukkad Natak' in the village in Jaunapur.

◆ With the involvement of students of Rajkiya Sarvodaya Kanya Vidyalaya, Sultanpur New Delhi, C-DOT conducted a Swachhta Awareness Rally in the Sultanpur village.

◆ Several competitions were also held on 'Swachhta' theme for the students of junior high school

Promotion of Hindi in C-DOT

C-DOT and Official Language: a Glimpse of Activities

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.

The month of September, 2018 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.

An audio-visual Quiz was also organized in Hindi, which was liked by one and all. 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.

A grand Kavi Sammelan was organized during Hindi Utsav. Eminent poets like Shri Lakshmi Shankar Vajpayee, Dr. Dinesh Raghuvanshi, Dr. Sarita Sharma and the legendary Dr. Rahat Indori mesmerized the audiences with their heart-rending poems.

We were fortunate to have Rajya Sabha member and the dance exponent Padma Vibhushan Vidushi Dr. Sonal Mansingh to feature in the much awaited programme Inse Miliye… on the inaugural day of Hindi Utsav.

A drama written by Peeyush Misra, based on the sacrifices of the great martyrs Bhagat Singh and Sukhdev, was enacted in C-DOT to make young engineers aware of our freedom fighters.

The well-known technologist and linguist Shri Balendu Sharma Dadhich was invited for his presentation on "Hindi and Technology". He gave information about all the latest Hindi Language tools and software.

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.

Vigilance Awareness Initiatives

A separate vigilance unit has been set up in the Organization in September, 2017 with the posting of a full time CVO. During the year 2018-19 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 are now filed regularly by the staff of C-DOT. Moreover, action for e-publishing of all tenders on CPP portal has been initiated in C-DOT and some of the procurements are also processed through GeM (Government e-Marketplace).

CTE type examination of few contracts were carried out by the Vigilance Unit and systemic improvements were suggested. Further, awareness' about Office procedures was generated amongst the target groups. Regarding complaints, all the complaints received were dealt in time, as per the complaint handling policy of the CVC.

Vigilance Awareness Week 2018 was observed successfully in C-DOT (both at Delhi and Bengaluru campus) from 30th Oct.-4th Nov. 2018, wherein outreach activities were also undertaken. The keynote address was delivered by Dr. Devesh Chaturvedi, Addl. Secretary, Department of Agriculture. Most of the employees have taken integrity e-pledge.

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INDEPENDENT AUDITOR'S REPORT

To the Members of the Board of
CENTRE FOR DEVELOPMENT OF TELEMATICS (C-DOT)

Opinion

We have audited the financial statements of **Centre for Development of Telematics (C-DOT**), which comprise the Balance Sheet at March 31st 2019, and the Statement of Income & Expenditure for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements give a true and fair view of the financial position of the entity as at March 31st, 2019, 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.

Basis for 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.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the aforesaid Accounting Standards, 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.

Auditor's Responsibilities for the Audit of the Financial Statements

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 SAs 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.

For Shiv & Associates
Chartered Accountants
FRN : 009989N

Sd/-
(CA Shiv Prakash Chaturvedi)
Partner
M.No.085084
UDIN : 19085084AAAAAF2137

Place : New Delhi
Dated : 19.08.2019

BALANCE SHEET AS AT MARCH 31, 2019

(in Rupees)

Particulars	Schedule No.	2019	2018
CORPUS/CAPITAL FUND AND LIABILITIES			
Corpus/Capital fund	1	3,33,83,30,102.21	4,05,49,01,722.88
Current liabilities and provisions	2	2,23,04,99,666.94	1,39,88,38,154.39
TOTAL		**5,56,88,29,769.15**	**5,45,37,39,877.27**
ASSETS			
Fixed assets	3		
Gross block		6,71,41,97,598.41	6,22,35,94,676.10
Less :- Depreciation		5,49,01,25,619.74	5,18,20,80,285.28
Net block		**1,22,40,71,978.67**	**1,04,15,14,390.82**
Asset in transit	3	-	16,11,200.90
Capital work-in-progress	4	62,52,840.00	62,52,840.00
Investments - long term	5	-	-
Current assets, loans, advances and deposits	6	4,33,85,04,950.48	4,40,43,61,445.55
TOTAL		**5,56,88,29,769.15**	**5,45,37,39,877.27**
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 Shiv & Associates
Chartered Accountants
Firm Regn. No. 009989N

For and on behalf of
Centre for Development of Telematics

Sd/-
(Shiv Prakash Chaturvedi)
Partner
Membership No. 085084
UDIN : 19085084AAAAAF2137

Sd/-
(G.Mukundan)
Chief Finance Officer

Sd/-
(Vipin Tyagi)
Executive Director

Place : New Delhi
Date: 19.08.2019

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2019

(in Rupees)

Particulars	Schedule No.	2019	2018
INCOME			
Income from TOT, Royalty, TSR/FSR & Publications	7	62,34,20,166.00	1,08,65,29,588.50
Interest earned	8	7,94,47,467.00	5,20,17,569.23
Other income	9	5,28,34,872.50	8,24,15,215.95
TOTAL (A)		**75,57,02,505.50**	**1,22,09,62,373.68**
EXPENDITURE			
Establishment expenses	10	2,41,35,14,325.12	2,09,94,14,048.61
Operational expenses	11	1,00,09,26,254.48	63,91,52,228.91
Other administrative expenses	12	34,84,02,032.49	34,04,56,696.37
Depreciation	3	30,80,46,554.46	24,25,57,877.72
TOTAL (B)		**4,07,08,89,166.55**	**3,32,15,80,851.61**
Excess of expenditure over income for the year [(B)-(A)]		3,31,51,86,661.05	2,10,06,18,477.93
Add/(Less) :-			
Adjustments pertaining to prior period items (Net)	13	13,84,959.62	(89,63,635.31)
Extraordinary Expenses	-	-	-
Balance being excess of expenditure over income		**3,31,65,71,620.67**	**2,09,16,54,842.62**
Add :- Excess of expenditure over income of previous years		27,17,00,51,439.24	25,07,83,96,596.62
Balance being deficit carried to Corpus / Capital fund		**30,48,66,23,059.91**	**27,17,00,51,439.24**
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 Shiv & Associates
Chartered Accountants
Firm Regn. No. 009989N

For and on behalf of
Centre for Development of Telematics

Sd/-
(Shiv Prakash Chaturvedi)
Partner
Membership No. 085084
UDIN : 19085084AAAAAF2137

Sd/-
(G.Mukundan)
Chief Finance Officer

Sd/-
(Vipin Tyagi)
Executive Director

Place : New Delhi
Date: 19.08.2019

SCHEDULE 1- CORPUS/CAPITAL FUND

(Forming part of the Balance Sheet as at March 31, 2019)

(in Rupees)

Particulars	2019	2018
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	30,88,97,53,162.12	28,01,97,53,162.12
Add:- Contributions towards corpus/capital fund during the year	2,60,00,00,000.00	2,87,00,00,000.00
Subtotal (B)	**33,48,97,53,162.12**	**30,88,97,53,162.12**
Total [(A)+(B)]	**33,82,49,53,162.12**	**31,22,49,53,162.12**
Less :- Balance of net expenditure transferred from the Income and Expenditure account	30,48,66,23,059.91	27,17,00,51,439.24
TOTAL	**3,33,83,30,102.21**	**4,05,49,01,722.88**

SCHEDULE 2-CURRENT LIABILITIES AND PROVISIONS

(Forming part of the Balance Sheet as at March 31, 2019)

(in Rupees)

Particulars	2019	2018
A. CURRENT LIABILITIES		
1 Sundry Creditors		
a) For Goods	31,77,17,113.54	18,01,11,135.56
b) Others	10,23,54,001.84	8,17,87,958.45
2 Advances received		
- For Funded Projects	64,24,86,016.50	31,92,35,495.60
3 Statutory Liabilities	6,79,65,149.00	15,76,35,570.00
4 Other Current Liabilities	43,88,37,621.06	16,67,37,551.78
Subtotal (A)	**1,56,93,59,901.94**	**90,55,07,711.39**
B. PROVISIONS		
1 Gratuity	6,25,90,856.00	97,75,001.00
2 Earned leave	59,85,48,909.00	48,35,55,442.00
Subtotal (B)	**66,11,39,765.00**	**49,33,30,443.00**
TOTAL (A+B)	**2,23,04,99,666.94**	**1,39,88,38,154.39**

SCHEDULE 3-FIXED ASSETS
(Forming part of the Balance Sheet as at March 31, 2019)

(in Rupees)

Particulars	Gross Block				Depreciation				Net Block	
	As at 01.04.2018	Additions	Adj./Write-off	As at 31.03.2019	As at 01.04.2018	For the year	Adj./Write-off	As at 31.03.2019	As at 31.03.2019	As at 31.03.2018
(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	42,44,00,188.52	1,45,78,077.91	-	43,89,78,266.43	13,12,02,701.22	14,57,80,779.13
Building-Residential	2,36,27,434.00	-	-	2,36,27,434.00	1,58,99,182.56	3,86,412.57	-	1,62,85,595.13	73,41,838.87	77,28,251.44
R&D Equipment	2,07,96,78,519.58	14,91,53,548.72	-	2,22,88,32,068.30	1,67,24,62,571.03	8,34,55,422.49	-	1,75,59,17,993.52	47,29,14,074.78	40,72,15,948.55
R&D Computers	2,65,16,97,506.70	25,73,72,118.59	-	2,90,90,69,625.29	2,45,73,18,581.48	18,07,40,501.71	-	2,63,80,59,083.19	27,10,10,542.10	19,43,78,925.22
Office Equipments & Appliances	38,67,47,401.56	38,68,658.00	-	39,06,16,059.56	31,90,70,734.95	1,07,69,326.39	-	32,98,40,061.34	6,07,75,998.22	6,76,76,666.61
Furniture & Fixtures	33,25,44,901.23	7,99,62,552.00	-	41,25,07,453.23	23,38,11,081.36	1,78,69,548.39	-	25,16,80,629.75	16,08,26,823.49	9,87,33,819.87
Library Books	5,91,17,945.38	2,47,265.00	(1,220.00)	5,93,63,990.38	5,91,17,945.38	2,47,265.00	(1,220.00)	5,93,63,990.38	-	-
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**
Previous year's total	5,90,39,47,190.71	31,96,48,094.39	(609.00)	6,22,35,94,676.10	4,93,95,23,016.56	24,25,57,877.72	(609.00)	5,18,20,80,285.28	1,04,15,14,390.82	96,44,24,174.15
(B) Assets in transit									-	16,11,200.90

SCHEDULE 4-CAPITAL WORK IN PROGRESS
(Forming part of the Balance Sheet as at March 31, 2019)

(in Rupees)

Particulars	As at 01.04.2018	Additions	Trf. to fixed assets	As at 31.03.2019
Campus - Delhi				
Campus - Residential Complex	62,52,840.00	-	-	62,52,840.00
Total	**62,52,840.00**	**-**	**-**	**62,52,840.00**
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, 2019)

(in Rupees)

Particulars	Number of fully paid equity shares	Face value per share	2019	2018
UNQUOTED (AT COST)				
JOINT VENTURE COMPANY				
CDOT 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, 2019)

(in Rupees)

Particulars	2019	2018
A. CURRENT ASSETS		
1 Inventories (as taken, valued and certified by the Management)		
a) Stores and spares	65,36,63,579.85	63,14,45,010.23
b) Inventory in transit	25,86,276.49	95,90,755.90
	65,62,49,856.34	**64,10,35,766.13**
2 Sundry debtors		
a) Debts outstanding for a period exceeding six months	1,45,90,69,161.16	61,39,52,660.20
b) Others	53,74,65,556.80	1,08,75,99,474.00
	1,99,65,34,717.96	1,70,15,52,134.20
Less:- Provision for bad & doubtful debts	1,89,37,915.00	1,89,37,915.00
	1,97,75,96,802.96	**1,68,26,14,219.20**
3 Bank Balances		
a) With Scheduled banks		
On Current Accounts	52,07,311.29	61,13,729.29
On Deposit Accounts	53,86,31,798.22	1,18,80,00,000.00
On Savings Accounts	54,86,06,504.18	29,59,00,920.26
	1,09,24,45,613.69	**1,49,00,14,649.55**
Total (A)	**3,72,62,92,272.99**	**3,81,36,64,634.88**
B. LOANS & ADVANCES		
1 Loans		
a) Staff	55,35,108.00	56,15,122.00
b) CARC Pvt Ltd	18,45,78,500.00	18,45,78,500.00
	19,01,13,608.00	19,01,93,622.00
Less:- Provision for Bad & doubtful Loans -CARC (P) Ltd	18,45,78,500.00	18,45,78,500.00
	55,35,108.00	**56,15,122.00**
2 Advances and other Amounts Recoverable in Cash or in Kind or for value to be received		
a) Contractors & Suppliers	12,41,58,066.90	17,27,44,864.08
b) Employees	19,57,149.15	34,27,405.73
c) Prepaid expenses	1,28,52,960.08	1,45,54,179.43
	13,89,68,176.13	**19,07,26,449.24**
3 Interest Accrued		
a) Staff Loan	4,69,394.48	8,76,643.46
b) On Bank Deposits	86,64,687.78	84,05,363.22
c) CARC Loan	5,98,58,060.00	5,98,58,060.00
	6,89,92,142.26	**6,91,40,066.68**
4 Claims Receivable	31,98,88,856.31	26,35,02,545.31
Less:- Provision for Bad & doubtful Claims Receivable	19,78,41,104.35	19,78,41,104.35
	12,20,47,751.96	**6,56,61,440.96**
5 Tax deducted at source	**22,29,19,785.86**	**24,19,54,271.06**
6 Input Tax Credit	**4,43,39,450.28**	**81,55,707.73**
Total (B)	**60,28,02,414.49**	**58,12,53,057.67**
C. DEPOSITS		
1 Office Building	40,500.00	1,20,500.00
2 Others	93,69,763.00	93,23,253.00
Total (C)	**94,10,263.00**	**94,43,753.00**
TOTAL (A+B+C)	**4,33,85,04,950.48**	**4,40,43,61,445.55**

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

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019	2018
1) Income from Royalty	6,94,31,080.00	14,43,14,355.00
2) Income from Transfer of Technology (TOT)	1,33,50,000.00	2,46,00,000.00
3) Technology/Field support receipts (TSR/FSR)	54,05,64,730.00	91,74,79,413.00
4) Income from Publications	74,356.00	1,35,820.50
TOTAL	**62,34,20,166.00**	**1,08,65,29,588.50**

SCHEDULE 8-INTEREST EARNED

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019	2018
1) On term deposits with Scheduled Banks	4,11,95,636.22	4,41,09,312.73
2) On savings accounts with Scheduled Banks	58,46,698.76	59,26,374.30
3) On loans to employees	5,69,251.02	6,77,344.20
4) On loans to others	-	11,10,504.00
5) Others	3,18,35,881.00	1,94,034.00
TOTAL	**7,94,47,467.00**	**5,20,17,569.23**

SCHEDULE 9-OTHER INCOME

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019	2018
1) Income from rent	3,20,76,346.00	4,13,75,264.00
2) Gain due to foreign exchange transalation	11,53,688.28	18,48,748.53
3) Bad & doubtful debts recovered	-	1,69,95,329.00
4) Miscellaneous income	1,96,03,618.22	2,21,95,265.42
5) Profit on sale/disposal of assets	1,220.00	609.00
TOTAL	**5,28,34,872.50**	**8,24,15,215.95**

SCHEDULE 10-ESTABLISHMENT EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019	2018
a) Salaries and wages	1,79,54,61,043.88	1,55,29,58,902.00
b) Bonus	12,86,044.00	13,86,205.00
c) Contributions to provident fund	15,34,97,522.00	15,99,43,069.00
d) Contributions to other fund	1,31,05,558.00	1,44,02,576.00
e) Gratuity provided for employees	6,25,70,906.00	6,97,75,001.00
f) Staff welfare expenses	37,06,78,782.79	28,70,61,768.00
g) Rent on residentials & maintenance expenses	5,79,714.00	24,45,136.00
h) Recruitment and training expenses	1,63,34,754.45	1,14,41,391.61
TOTAL	**2,41,35,14,325.12**	**2,09,94,14,048.61**

SCHEDULE 11-OPERATIONAL EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019	2018
a) R&D components & consumables	37,46,04,623.71	32,95,76,681.46
b) Freight & forwarding charges	1,76,18,723.77	2,04,30,532.24
c) Repair & maintenance - R&D/office equipments	8,14,49,909.13	7,20,13,910.21
d) Design, development & technology support expenses	46,18,64,253.00	14,94,67,058.00
e) Technical, Apprentice & Consultancy expenses	6,31,43,517.87	6,49,09,566.00
f) Testing charges	22,45,227.00	27,54,481.00
TOTAL	**1,00,09,26,254.48**	**63,91,52,228.91**

SCHEDULE 12-OTHER ADMINISTRATIVE EXPENSES

(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019		2018	
a) Travelling and conveyance expenses		6,31,91,281.66		5,61,17,514.32
b) Vehicle hire charges		41,03,951.50		35,66,986.50
c) Rent, rates & taxes		28,78,633.00		52,21,661.00
d) Interest/ penalty paid		40,314.00		1,40,877.00
e) Electricity & water charges		9,87,56,664.76		10,00,00,524.00
f) Repair & maintenance - Others		10,15,07,523.64		10,12,18,724.00
g) Newspaper , periodicals & journals		75,87,106.63		64,27,652.28
h) Insurance charges		10,40,628.76		9,88,540.00
i) Printing, stationery, photocopy & admin consumables		81,43,853.58		1,16,23,309.34
j) Postage, telephone and communication charges		90,64,919.45		1,32,83,662.58
k) Exhibition, advertisement & publicity expenses		1,88,28,089.50		2,20,38,368.00
l) Conference/ seminar/ membership fees		79,04,677.36		72,17,247.50
m) Legal, professional fees & honorarium		65,63,026.00		45,35,132.00
n) Patent fees		90,71,030.00		47,60,428.00
o) Remuneration to auditors				
Audit fees	3,00,000.00		3,00,000.00	
Out of pocket expenses	1,08,092.00	4,08,092.00	1,08,490.00	4,08,490.00
p) Hospitality/ entertainment expenses		83,600.00		57,075.00
q) Bank charges		17,75,686.97		19,03,846.80
r) Loss due to foreign exchange translation		74,45,568.36		9,26,958.05
s) Miscellaneous expenses.		7,385.32		19,700.00
TOTAL		34,84,02,032.49		34,04,56,696.37

SCHEDULE 13-ADJUSTMENTS PERTAINING TO PRIOR PERIOD ITEMS (NET)
(Forming part of the Income & Expenditure Account for the year ended March 31, 2019)

(in Rupees)

Particulars	2019		2018	
	Debit	Credit	Debit	Credit
INCOME				
Income from TOT, Royalty, TSR/FSR & Publications	3,67,502.40	-	-	-
Interest earned	-	-	4,20,226.00	-
Other income	-	-	-	-
EXPENDITURE				
Establishment expenses	6,634.00	-	6,13,422.00	-
Operational expenses	-	14,35,902.78	-	1,01,47,777.64
Other administrative expenses	24,46,726.00	-	1,50,494.33	-
Depreciation	-	-	-	
TOTAL	28,20,862.40	14,35,902.78	11,84,142.33	1,01,47,777.64
NET TOTAL	**13,84,959.62**			**89,63,635.31**

SCHEDULE 14:-SIGNIFICANT ACCOUNTING POLICIES

(Forming part of the financial statements for the year ended March 31, 2019)

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 and includes, wherever applicable, appropriate overheads.

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 expenses and income in relation to these, are accounted for as expenditure/income respectively, 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 as advances/recoverable on the balance sheet date.

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.

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) 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.

b) 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, 2019)

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. 62.53 lakhs as at 31.03.2019 (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. 611.40 lakhs as at 31.03.2019 (Previous year Rs. 521.75 lakhs). The Management is of the view that these components may be required for use in any of the future R&D and field maintenance activities of the Centre.

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. 70.51Lakhs (Previous year- Rs. 149.94 lakhs).

b. Sundry Debtors amounting to Rs. 19965.35 Lakhs as at 31.03.2019 (Previous year Rs. 17015.52 lakhs) includes:-

i. TOT, Royalty & Technology support dues amounting to Rs 3208.28 lakhs as at 31.03.2019 (Previous year- Rs. 2598.95 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. However, formal transfer of land and building has not been made so far.

ii. Dues for technology/field support/other services rendered to Telecom companies amounts to Rs. 11206.27 lakhs as at 31.03.2019 (Previous year- Rs. 10150.06 lakhs). It is considered good and fully recoverable.

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.

iv. Other dues amounting to Rs. 5361.42 lakhs (Previous year Rs. 3628.74 lakhs) are considered good and fully recoverable.

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 31.03.2019 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 31-03-2019 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, the Centre has not made any provision against the interest due on loan.

e. Claims Receivable:-

Amount realizable, on account of projects undertaken for other organizations, on reimbursement of cost basis

aggregating Rs. 2909.85 lakhs (Previous year- Rs. 2576.58 lakhs) after providing for "Provision for Bad and Doubtful Claims Receivable" of Rs. 1978.41 lakhs (same as previous year) amounts to Rs. 931.44 lakhs as at 31.03.2019 (Previous year- Rs. 598.17 lakhs) is considered good for recovery.

Balance of claims receivable amounting to Rs. 289.04 lakhs (Previous year- Rs. 58.44 lakhs) are considered good for recovery.

f. Tax Deducted at Source:-

Tax deducted at source receivable pertaining to various years, amount to Rs 2229.20 lakhs as at 31.03.2019 (Previous year-Rs. 2419.54 lakhs) is considered good for recovery.

5. Contingent Liability:-

a. On account of unexpired letters of credit issued by bankers in respect of purchase orders for procurement of components and equipment - Rs. 224.72 lakhs as at 31.03.2019 (Previous year-Rs. 164.40 lakhs).

b. On account of pending legal cases, the amount outstanding is Rs 450.00 lakhs as at 31.03.2019 (Previous year- Rs. 20.87 lakhs).

PART - B: Income & Expenditure Account

A. Employees' Benefits:-

i. Provident Fund (PF):-

The Centre makes contributions towards Provident Fund which is mainly administered through duly constituted and approved Exempted Trust. Provident Fund contributions are in the nature of defined contribution scheme. In respect of employees who are members of the trust, the Centre recognizes contribution payable to such trusts as an expense including inspection and administrative charges.

ii. Gratuity:-

Liability on account of Gratuity using the Actuarial valuation method, based on existing pay and allowances is Rs 6908.93 lakhs (Previous year- Rs. 5920.26 lakhs). The net expenditure recognized in the Income & Expenditure account for Gratuity in the current year is Rs 625.71lakhs (Previous year- Rs. 697.75 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.

iii. 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. The provision for liability, based on existing pay and allowances, estimated using actuarial valuation method, in respect of Earned Leave of employees as at 31.03.2019, is Rs. 5985.49 lakhs (Previous year- Rs. 4835.55 lakhs).

B. Bonus

The Centre makes ex-gratia payment to eligible employees, as per applicable policy for the time being in force. These ex-gratia payments are accounted for on estimate basis every year. The estimated expenditure provided for the financial year 2018-19 is Rs. 12.86 lakhs (Previous year- Rs. 13.86 lakhs).

C. 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. 3746.05 Lakhs (Previous year- Rs. 3295.77 Lakhs).

D. Repair & maintenance -others

It includes civil works expenditure amounting to Rs. 96.85 lakhs for the current year (Previous year- Rs. 70.09 lakhs), incurred on campus at Bangalore.

E. 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. 62.92 Lakhs (Previous year gain- Rs. 9.22 Lakhs).

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

F. Adjustments Pertaining to earlier years (Net):-

It includes income of Rs. (-) 3.68 lakhs (Previous year Rs. (-) 4.20 lakhs) and expenditure of Rs 10.17 lakhs (Previous year Rs. (-) 93.84 lakhs).

PART - C: General

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

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
Vipin Tyagi
Executive Director

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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-1,Hosur Road
Bengaluru-560 100

Central Bank of India
Sona Towers, 71/1 , Millers Road
Bengaluru-560 100

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

Shiv & Associates
Chartered Accountants
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Delhi -110 092