



सी-डॉट
C-DOT



Architecting
Digital Infrastructure

2015-16 | ANNUAL REPORT

Centre for Development of Telematics
(CMMI Level 5 organization)



C-DOT's *Vision*

is 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.



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C-DOT Management

Governing Council

Chairman

Minister of Communications & IT

Vice-Chairman

Minister of State for Communications & IT

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

C-DOT, India's premier telecommunications R&D centre, has been a pioneer and a nation builder. Committed to providing a wide range of indigenously developed, cost-effective, state-of-the-art total telecom solutions, it has come a long way since its inception 31 years ago. C-DOT's world class R&D facilities are located at Delhi & Bengaluru.

In the eighties, C-DOT developed rural telecommunication products ideally suited to Indian conditions. Capable of working without air conditioning, the C-DOT Rural Automatic Exchanges (RAXs) acquired legendary status for their ruggedness and reliability. Starting from the single mission of providing a dial tone, C-DOT has grown, over the last 31 years, to the level of a national centre for Research and Development in telecommunication technology in many areas viz. Satellite Communications, Intelligent Network (IN), Asynchronous Transfer Mode (ATM), Dense Wavelength Division Multiplexing (DWDM), Network Monitoring System (NMS), Broad Band Wireless Terminal (BBWT), Gigabit Passive Optical Networks (GPON), Next Generation Network (NGN) and Mobile Cellular systems.

Our ATM technology is in use for onboard communications in Indian Navy ships. C-DOT's indigenously developed Gigabit Passive Optical Network (GPON) technology is the infrastructural backbone of the prestigious Pan-India Optical Fibre Network, Bharat Net, thus poised to play a significant role in extending the broadband pipes to every nook and corner of the nation.

C-DOT's Wi-Fi Solution Suite provides a cost-effective, green solution for extending the IP connectivity to remote and rural areas through wireless network. It can also be used for creating Wi-Fi Hotspots, Backhaul links for Wi-Fi hot spots, cellular base stations and base station

controllers, ATMs, Database servers etc.

Designed to bridge the digital divide between urban and rural India thus boosting the Digital Empowerment, C-DOT GyanSetu enables the personalized access of various e-governance services including e-health, e-education, e-mandis etc. delivering the targeted content to the users including the visually impaired and specially abled, in the vernacular languages in audio, visual and text formats.

The SG-RAN product, based on sharing of active GSM infrastructure, can bring affordable mobile telephony to the rural market. The MAX-NG is breathing fresh life into the fixed line infrastructure of the country by bringing new service features to POTS (Plain Old Telephony Service) along with VoIP and broadband access to C-DOT's MAX / RAX subscribers. STBR, the first indigenously developed terabit router of country meets the TSP's routing requirements for core and edge network.

C-DOT has also been active in the area of providing telecom software solutions. C-DOT's umbrella NMS (Network Management System) solutions have made it possible to manage heterogeneous networks with elements from multiple vendors. C-DOT is also entrusted with the projects of national importance, like Central Monitoring System for telecom security and Secure Network for strategic applications. C-DOT's Geo-Intelligence Solution provides easy mapping, planning and optimization of telecom service provider fiber network.

Quality of products and process as per international standard has been the focal point of C-DOT for last three decades. Our well laid process framework has now been appraised at CMMI level 5.

ACCOMPLISHMENTS AND ACTIVITIES

during F.Y. 2015-2016

FY 2015-2016 witnessed significant progress in the development of state-of-the-art cutting edge technologies, technology trials, efforts in technology commercialization, which include signing of MoUs with manufacturers, technology promotions, showcasing to prospective vendors, building requisite IPR assets, etc.

Some of the major technology projects, wherein progress has been made, are summarized below:

Next Generation security for telecom and data networks: Development of an AIMS to scale up the architecture framework of the present CMS, development of interception solutions for new technologies like LTE/LTE-A, IMS-compliant FMCP, integration with other security agency solutions, and Advanced Intelligence (AI) manager technique(s).

Satellite-based technologies: Design and development of a satellite hub baseband system.

Power efficient green telecom technologies: Design and development of an alternate power supply system based on green technologies specifically for CPEs (Customer Premises Equipment), mobile towers (BTS) and also to supply power to current and future products developed in C-DOT.

Enabling technologies and telecom networks: Undertaken feasibility studies/ prototyping on emerging telecom technologies.

Technology field implementation/trials: Undertaken some of the developed technologies for field implementation.

Through these indigenous developments and the support of indigenous manufacturers, C-DOT offers complete solutions required for urban, rural, north-east and strategic sectors, such as, Defence and Security. Besides, C-DOT also provides life-time support to its technology in the TSPs' network with continuous technology upgradation, value addition, bug-fixing and providing alternate designs to address component obsolescence.

Communication and security research and monitoring: Central Monitoring System (CMS) infrastructure roll-out, which includes installation of Central Monitoring Centre (CMC) Data Centre build and its IT infrastructure, Regional Monitoring Centre (RMCs) Data Centre build in 21 License Service Areas (LSAs), International Long Distances (ILDs) etc., for lawful interception of voice and data by Lawful Enforcement Agencies (LEAs).

Broadband technologies: Carrying out software adaptations of multi-terabit router for IMS (IP Multi-media System) and 4G.

Next generation mobile technologies: Development for LTE Femto eNodeB system.

Carrier networks transport technologies for transport and access networks: Technology development for the next generation PON system for applications requiring more bandwidth in the access and DWDM-based transport network system for long haul applications.

Secure wireless and wireline networks: Design and development of Wireless Phone Secure (WiPS) tablet and hand-held devices.



High Speed Access Point (HSAP)



LTE-A



WDAN



Titli Damak

Achievements and progress made in the various schemes of technical projects are discussed in the following sections:

1. Communication and security research and monitoring

The progress under this development scheme includes development, enhancements, software customisation and progressive roll-out of the technology in the field.

Technology roll-out for CMS commenced and progressively completed various activities, namely; RMCs installation in 19 LSAs, making 3 ILDs (International Long Distance) operational in CMS network, technical commissioning RMC Delhi, CMC (Central Monitoring Centre) and DR build is in progress.

2. Broadband technology

Design and development for high capacity multi-terabit router is in progress, with hardware implementation about 90% complete and software porting is ongoing. System integration and testing also commenced, with module level testing going on at present. The design of security applications over multi-terabit router has also progressed.

3. Next generation mobile technology

Next generation mobile technology comprises of development for LTE-A, the 4th generation mobile technology. Activities that have significantly progressed include development completion for RRM, OAM and commencement for internal testing. ToT package also was readied for femto LTE system in FDD band. Efforts are going on for manufacturing tie-up.

4. Carrier networks transport technologies for transport and access networks

The development projects presently going on under carrier network transport, that progressed significantly, are as below:

Optical Aggregation and Access System (OAAS) is

a next generation PON system. The ongoing development is based on two different technologies, namely, DWDM-based (known as WDM PON) and X-GPON (10 Gigabit PON). 32G WDAN (Wavelength-based Distribution and Aggregation Network) PON system caters to 32 ONTs on one PON fibre. X-GPON supports 10G downstream and 2.5G upstream on the PON interface based on TDM/TDMA. 32G WDAN PON system provides 1G guaranteed symmetrical bandwidth in access, suitable for civil and Defence applications and X-GPON OLT will facilitate in upgrading existing OLT infrastructure installed in the network to higher capacity. The development for 32G PON system has been completed. Discussions are on with BBNL and Navy for pilot trials in their networks. Development, including integration and testing of X-GPON OLT prototype is also complete and its validation is in progress.

Optical Core Network (OCN) is a DWDM-based optical transport network for long-haul applications to support data rate of 40/100 Gbps per channel at line/WDM side. A 100G OTN platform, namely Suteevra, for point-to-point communication has been developed. The technology has also been deployed in the MTNL network in Delhi for trial. The development for WDM-based OTN platform for 80-channel system (traffic handling capacity of 8000 Gbps) also progressed significantly with completion of terminal equipment for 40G Muxponder, ILA, ROADM, and DWDM EMS architecture design been completed. System integration and testing is in progress for 40G system in the lab.

5. Secure wireless and wireline networks

Design and development of WiPS is in progress, which involves development of core network elements and end-user devices for setting up a secure mobile wireless network using standard wireless technologies, like 3G and WiFi.

Development for core network element has been completed. WiPS software has been ported on

off-the-shelf handset. The design and packaging for end-user device – secure Tablet (ver.2), has been completed. SIP client has been tested on COTS (Commercial-off-the-Shelf) phones and tablet in C-DOT SDCN Softswitch configuration.

6. Satellite-based technologies

The phase-1 development for prototype satellite hub baseband system with connectivity to terrestrial networks with RF sub-system of satellite (front-end) has been completed, successfully integrated, tested with satellite and delivered to the client. The architecture has been finalised for carrier-grade satellite hub to be taken up as phase-2 development.

7. Next generation security for telecom data networks

AIMS project is to address the enhanced security and interception requirements of LEAs.

The progress made under this project includes completion of design and development of interception solution for new technologies, like IMS-compliant FMCP, IPv6 support for interception, NMS enhancements, CMS enhancements for end-to-end workflow optimisation, EMS for NGN LIS (Lawful Interception System), call data prototyping with basic AI techniques, enhancements in analysis for PSTN and CDMA CDRs, CMS software scaling up, etc.

8. Power efficient and green telecom technologies

Pilot trial for 75W system in the field has been completed. The system has also integrated with solar Wi-Fi and has been offered for ToT. Requirements specification and architecture design are finalised for 2000W system. Design implementation is in progress for 2000 W module and system engineering is going on for modular 5000 W system.

9. Enhancements, new features, upgradation, adaptations and technical support for developed technologies including the North-East program

Progress made in technology support in the field includes enhancements, feature addition, scalability, value addition and customisation, etc. Technology-wise progress is summarised below:

- ⊙ **MAX-NG technology roll-out in BSNL network:** Acceptance testing is in progress for core, NMS has been installed for NOC operation and testing is in progress.
- ⊙ **NGN roll-out in MTNL network:** Trial network has been set up for roll-out of NGN technology, and C-DOT IMS-compliant NGN core is commercially operational in MTNL network. TAX functionality has been integrated into the network, NGN core and copper access node in Delhi and Mumbai for 1000 subscribers have been installed, and MTNL TFS has been migrated to C-DOT NGN-IN platform.
- ⊙ **ISP monitoring:** Solution has been implemented at 20 additional ISP Gateways. Training infrastructure has been set up and one IMS training course for LEAs has been conducted. IMS system has been handed over to 2 central LEAs and 1 state LEA – others are in the process of hardware procurement; thus 8 LEAs are onboard. Technical SOP is under finalisation for handing over of IMS infrastructure to PCI.
- ⊙ **NMS for NOFN:** NMS has been integrated with DCN link status monitoring system, DCN NMS development has been completed for Data Centre monitoring and its integration with vendor-specific MIBs going on. Customisation of NOFN NMS is complete, and load testing for 1 lakh GPs is awaiting hardware availability.
- ⊙ **Fault localisation, geo-intelligence and technology planning for NOFN:** FFLS has been successfully field tried in NCR Delhi and Sheetalagatta in Bengaluru. Survey report analysis for 1.3 lakh grampanchayats has been completed and activities are going on for remaining states.



Solar WiFi



Green Power Supply Unit



GyanSetu

10. Enabling technologies and telecom networks

Feasibility study, proof-of-concept and/or prototype development have been completed for green field areas, like M2M communication, Carbon footprint monitoring, White Space Radio, network optimisation of radio access network, etc.

i. Technology commercialisation

During this period, 9 various agreements, namely, MoUs, project agreements and ToTs, were signed with prospective PSUs, and manufacturers for technology implementations, manufacturing, customised developments etc. The details are given below:

Table - 1.2 : Agreements

S.No	Strategic partner	Purpose
A	MOUs/ Project agreements signed with prospective organisations	
i.	ANURAG (Advanced Numerical Research and Analysis Group) Hyderabad, DRDO	Development of Router Hardware Platform (RHP)
ii.	BEL, Bengaluru	Project agreement for providing support to C-DOT technology based ATM switches installed on various Indian Navy ships for next 5 years starting 1 st Oct. 2015
iii.	CAIR, DRDO	MoU for creation of advanced technologies for establishing secure high speed communication network and services
iv.	BSNL	Project agreement for technical support for DSS
v.	TCIL	MoU for co-operation for delivery of telecom products
B.	ToT agreements signed with prospective manufacturers	
i.	BEL, Bengaluru	Terabit router
ii.	BEL, Bengaluru	DSP platform for transcoding
iii.	BEL, Kotdwara	MAX-NG
iv.	ITI, Mankapur	MAX-NG
v.	IL, Kota	MAX-NG
vi.	ECIL, Hyderabad	MAX-NG
vii.	ToT/ licensing agreement extended with Keltron	256P RAX, SBM RAX, MAX-L
viii.	HFCL	BBWT, 4-port GPON OLT (Chatur Damini)
ix.	System Controls Technology Solutions Pvt Ltd	BBWT

During this period, purchase orders or letters of intent received for project implementation in the field, MoU signed for field support activities.

ii. Campus infrastructure

Statutory approval, except environmental clearance, has been awarded.

C-DOT Broad Band Wireless Terminal

C-DOT logo and name in Hindi.

CNMS

C-DOT NETWORK MANAGEMENT SOLUTION

C-DOT, the leading provider in the network management solutions arena, offers service providers a comprehensive suite of Network Management Solutions (NMS) which satisfies the service provider's needs for managing and monitoring the networks effectively.

CNMS-NOFN

NOFN NMS Salient Features

- Network Management System (NMS):**
 - Provides top management of network from main to core network. For all.
 - Provides management hierarchy by the hierarchical network layer for flow, bandwidth and performance management aspects.
- Network Management System (NMS):**
 - NOFN is exclusively related to GPON network components namely OLT and ONU.
 - NOFN is exclusively related to GPON network services namely Broadband Internet User Call, VoIP, IPTV.
- Topology Tracking:**
 - Double granular, automatic real-time topology for serviceable/Non-Serviceable (S/N) alarm. Topo modification via email & sms.
- NCA (Root Cause Analysis):**
 - Mechanism to correlate alarm and events and establish root cause for the configured events in the network management system (eg. RLI, SMI Fault Management).
- Data Center NMS (DC-NMS):**
 - Manage all IT services like Servers, Database, System, network hardware for NOFN NMS systems and is in beta order.

C-DOT... Providing Total Telecom Solutions since 1984

C-DOT 4G BROADBAND WIRELESS TECHNOLOGY (LTE-A)

The C-DOT LTE-A solution is a standards-based, packet only core network and an eNodeB with a simplified and modular architecture, providing support for anti-mobility between multiple heterogeneous access networks including (E-UTRAN and LTE Advanced air interfaces). 3GPP legacy systems (for example GERAN/UTRAN) but also non-3GPP systems (for example WiMAX or cdma2000, WiFi). This solution enables the mobile network operator to offer a new set of services to the users and enables products and network deployments to be built for bandwidth intensive services. It provides IP connectivity to terminals for both data and voice services.

C-DOT LTE-A solution comprises of the following network entities - the e-NodeB, the Mobility Management Entity (MME), the Home Subscriber Server (HSS), the Serving Gateway (S-GW), the Packet Data Network Gateway (P-GW) and the Policy And Charging Control Entity (PCRF).

SALIENT FEATURES

- Simplified Network Topology
- Well Defined Interfaces
- Support for Integration with Non-3GPP Access Networks
- Centralized Policy and Charging Support
- Handovers between 3GPP and Non-3GPP Networks
- Scalable Architecture
- High Availability support for EPC nodes
- Voice Services through IMS
- Log Management through Syslog and Log Rotate

ज्ञानसेतु GYANSETU

Empowering Rural India with Simplified Internet Access

e-governance market education service

GPON SOLUTION

VOICE VIDEO DATA

CRAT-100/CRDT-100 ROUTER

The exponential growth of Internet traffic has caused new developments in IP/MPLS router technology. The need for the offering of value added IP services ranging from QoS-based Internet access to real-time triple play services like IP telephony, social media, e-commerce, video-conferencing and IPTV has resulted in a demand for multi-service routers with better switching performance.

C-DOT's CRAT-100/CRDT-100 Router is a Next generation product, built to address challenges faced by service providers at the core and edge of the network. It supports features like NonStop Forwarding (NSF) and other value added features, which together makes IP/MPLS network fail-safe and reliable for NGN services and applications.

Product Features and Specifications

- **Switching Fabric Capacity**
 - ✓ 960Gbps
- **Network Interfaces**
 - ✓ 48x10G Optical or 1G Electrical/Optical Ethernet
- **Redundancy**
 - ✓ 1+1 for Power Supplies
 - ✓ Link Aggregation (L2)
 - ✓ ECMP (L3)
 - ✓ VRRP
- **Protocols supported**
 - ✓ IPv4
 - ✓ IPv6
 - ✓ MPLS

MAX-NG

Next Generation Home Subscriber Exchange

Fiber Monitor

Real-time Fiber Working Status

C-DOT SAMVAD APP for Secure Unified Communication

TECHNOLOGIES

C-DOT GSM Radio Access Network (CGRAN) (GSM Small BSS system)

This diagram illustrates the architecture of a GSM Small BSS system. It shows a central Base Station Controller (BSC) connected to multiple Base Transceiver Stations (BTS). Each BTS is further connected to several mobile phones, representing the radio access network. The system is designed for efficient coverage and capacity in a small geographic area.

Towards Green Telecom...

-DOT's GREEN POWER (HYBRID) SUPPLY SYSTEM

This slide introduces a hybrid power supply system for telecom equipment. It features a photograph of a solar panel array mounted on a structure. The text describes the system's components and benefits, including reduced energy costs and environmental friendliness. Key features listed include:

- Power source: Solar
- Backup power: Battery
- Control system: MPPT
- Monitoring: Remote
- Installation: Easy
- Maintenance: Low

C-DOT Solar Wi-Fi Solution

This slide presents a solar-powered Wi-Fi solution. It includes a photograph of a solar panel array connected to a Wi-Fi access point. The text explains how this solution provides internet access in remote areas without the need for traditional power lines. Key features listed include:

- Power source: Solar
- Backup power: Battery
- Control system: MPPT
- Monitoring: Remote
- Installation: Easy
- Maintenance: Low

L-DIGI MEM Communication Platform

This slide describes the L-DIGI MEM Communication Platform. It features two diagrams: 'L-DIGI MEM' and 'L-DIGI MEM (Mobile)'. The text details the platform's capabilities, including support for various communication protocols and services. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

Sabal

Proyek Telekomunikasi Sabal

This slide discusses the Sabal communication project. It includes a photograph of a telecommunications tower. The text provides details about the project's objectives, scope, and implementation. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

IMS Compliant C-DOT NGN

This slide introduces an IMS-compliant C-DOT NGN solution. It features a diagram showing the network architecture, including a central server and multiple access points. The text explains how this solution enables next-generation network services. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

Mini 100G OTN Platform

This slide presents a Mini 100G OTN Platform. It includes a photograph of the hardware device. The text describes the platform's high-speed data transmission capabilities and its compact design. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

Speed Up your Network

Optimize your Network Speed with NFM

This slide focuses on network optimization. It features a photograph of a laptop displaying network performance data. The text explains how Network Function Monitoring (NFM) can be used to identify and resolve network bottlenecks. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

WLAN

Wireless Local Area Network & Applications (WLAN Solution)

This slide discusses WLAN solutions. It includes a diagram showing a laptop connected to a wireless access point, which is then connected to a network. The text describes the benefits of WLAN for mobility and flexibility. Key features listed include:

- Support for various communication protocols
- Support for various services
- Support for various applications
- Support for various devices
- Support for various networks
- Support for various environments

ORGANISATIONAL PROCESSES AND PRACTICES to sustain CMMI level5

The organisation has been successfully appraised for CMMI Maturity Level 5, and through continuous improvement of organisational processes and practices and regular internal audits, the level of maturity is being sustained.

Process improvement:

In May 2014, the entire organisation, comprising of the R&D setups at Delhi and Bengaluru, successfully underwent SCAMPI-A appraisal for CMMI Maturity Level 5 in the very first attempt. The entire process from process design to final

appraisal took 14 months - much less than the initial estimate of 21-24 months for an organisation of this size and diversity of activities. Since the appraisal, all the process practices of levels 2 to 5 are being maintained in all development projects, continuous process improvements are in place and periodic internal process audits are being carried out to ensure sustenance of the process maturity level. Specific preparations have already started for the re-appraisal scheduled after three years, that is, May 2017

INTELLECTUAL PROPERTY RIGHTS

IPR Assets and Publications

Details of Patents Filed

S.No.	Invention	Application No. / Date of Filing
1.	GIS based Centralized Fiber Fault Localization System-India	1283/DEL/2015/ 07-05-2015
2.	A Real-Time Distributed Engine Framework of Ethernet virtual connections -India	3482/DEL/2015 / 27-10-2015
3.	GIS based Centralized carbon footprint monitoring system-India	201611008699/ 12-03-2016
4.	Gesture based human machine interface using marker (PCT) -PCT -International	PCT/IB2015/053708/ 20-05-2015

Details of Designs filed

S.No.	Invention	Application No. / Date of Filing
1.	VOIP CPE-2 for LG network	277084 / 30-10-2015
2.	Optical Network Terminal Device (DAMAK 11)	277995 / 30-11-2015

Details of Designs Registered

S.No.	Invention	Application No. / Date of Filing	Design No./ Date of Grant
1.	Electronic equipment for USB charging and holding portable communication devices	264078 /17-07-2014	264078 /08-01-2016

Details of Publications in 2015-16

S.No	Title	Publication Details
1.	Role of R&D in Telematics in the effective implementation of "Make In India " program	International Journal of Business and Administration Research Review – Vol-1, Issue-1, June-Aug 2015, Page-1
2.	Geo-Intelligence Based Fiber Fault Localization System For Rural India	2015 International Conference on Industrial Instrumentation and Control (ICIC), College of Engineering Pune, India. 28 th -30 th May, 2015
3.	Web based Spatial Data Infrastructure to facilitate E-Services in Rural India	Conference - Emerging Trends & Research in Engineering, Technology & Science 30 th -31 st March 2016.
4.	Query-by-example spoken term detection using dimensional posteriorgrams motivated by articulatory classes	Multimedia Signal Processing Conference, Xiamen, China, 19 th -21 st Oct 2015
5.	The rich and middle classes on Twitter: Are popular users indeed different from regular users?	Elsevier's International Journal – "Computer Communications: Volume 73, Part B, 1 st January 2016, Pages 219-228
6.	How to port PetaLinux onto your Xilinx FPGA	XILINX Xcell Journal, Issue 90, first quarter 2015
7.	Efficacy of Numeric Keypad for Computer Illiterates in Rural ICT	Journal of Computer Science Volume 11, Issue 8, Pages 928-935

NATIONAL IP AWARDS 2016

Confederation of Indian Industry (CII) in collaboration with Department of Industrial Policy and Promotion (DIPP) and the Intellectual Property Office (IPO), India recognize the use of IPRs as a strategic tool in commerce and industry through National IP Awards.

Centre for Development of Telematics (C-DOT) has been selected as a Winner for the year 2016 in the category of "R & D institution/organization for Patents". The award comprised of cash prize of Rs. One lakh, a Memento and a citation.



Receiving the award from Smt. Nirjala Sitharaman, Hon'ble Minister of Commerce and Industry, Govt. of India

IPR DAY CELEBRATIONS 2016



C-DOT, Delhi inventors receiving awards from Shri R.J.S. Kushvaha, Wireless Adviser to the Govt. of India



C-DOT, Bengaluru inventors receiving awards from Padmashree Prof. N. Balakrishnan

KNOWLEDGE MANAGEMENT

Training

Constant efforts are made to enhance the skill sets of C-DOT employees. For this employees are encouraged to participate in various seminars and conferences. Various internal and external trainings on both technical and soft-skill areas are arranged for the employees. Various technical topics on which training during the year were arranged are JAVA, IP, MS-Excel, C-DOT Routers, 5G, various wireless technologies, CMMI processes, REDHAT, Linux, Signal Integrity, Innovation, IOT etc. Apart from technical trainings employees are encouraged to attend soft skill trainings also. During the year various soft skill workshops attended were on topics like Anger management, Work life balance, Communication

skills, Gender sensitizing, Motivation, Ethics, Self management, Time management etc

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 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.

S.No.	Name of the Memberships	Type of Memberships
1	All India Management Association (AIMA) www.aima-ind.org	Institutional Membership since 1994
2	Asia Pacific Telecommunity (APT) www.aptsec.org	Affiliate Membership since 2002
3	Asia Pacific Network Information Centre (APNIC) www.apnic.net	Associate Membership since 2005
4	Delhi Management Association (DMA) www.dmadelhi.org	Patron Membership since 1996
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	Association since 2009
7	European Telecommunication Standards Institute (ETSI) http://www.etsi.org	Associate Membership since 1999
8	Fiber To The Home (FTTH) Council http://www.ftthcouncilap.org	Silver Membership since 2010

S.No.	Name of the Memberships	Type of Memberships
9	India Electronics & Semiconductor association (IESA) http://www.iesaonline.org	Since 2013
10	Institute of Directors (IOD) http://www.iodonline.com	Institutional Membership since 2015
11	Institution of Electronics and Telecommunication Engineers (IETE) http://www.iete.org	Organizational Membership since 2010
12	Internet Protocol Television Society (IPTV) Broad Band IndiaForum http://www.iptvforum.org.in	Corporate Membership since 2015
13	National Association of Software and Service (NASSCOM) www.nasscom.in	Associate Membership since 1996
14	Pacific Telecommunication Council (PTC) India Foundation www.ptcindia.com	Corporate Membership since 1997
15	PICMG http://www.picmg.org	Associate Membership since 2015
16	Telecom Equipment & Services Export Promotion Centre (TEPC) http://www.telecomepc.in	Since 2015
17	Telecommunications Standards Development Society, India (TSDSI) http://www.tsdsi.org	Institutional Membership since 2014
18	WiFi Alliance http://www.wi-fi.org	Regular Membership since 2016
19	Wireless Broadband Alliance http://www.wballiance.com/	General Member since 2016
20	Current Science Association www.currentscience.ac.in	Institutional Membership since 2016

Knowledge Centre

A Knowledge Centre has been established to provide latest scientific and technical information to support C-DOT research and development activities at both Delhi & Bengaluru centers. It includes a rich collection of more than 14,000 technical books, 2000 hindi books and over 70 periodicals and magazines besides country's 13 leading Newspapers and Newsletters. For the year 2015-16 a total of 60 new technical books and 120 hindi 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 IEEE (Institute of Electrical and Electronics Engineers) 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.

Apprentice 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 Apprentices Act, 1961. As per these guidelines C-DOT also takes apprentices (graduate, diploma and ITI) on yearly basis.

Category	Onroll as on 31-03-15	Period from 1 st April 2015 to 31 st March 2016			Strength as on 31-03-16
		Recruited	Resigned	Completed	
Graduate	19	39	7	14	37
Diploma- Technical	-	7	-	-	7
ITI	8	17	2	8	15
Total	27	63	9	22	69

BUSINESS PROMOTION

1. Acceptance of proposal for installation of C-DOT LEMF Solution and its integration with CMS received from Bhopal Police, UP Police, J&K Police, Shillong Police. Proposal is also submitted to other agencies like NIA, Maharashtra Police etc.
2. An MoU is signed with BSNL for field support of MAX.
3. Project agreement is signed with M/s BEL to support C-DOT ATM technology installed across various ships of Indian Navy for a period of five years.
- 4 Supply Order received for Transmitter cards from ANURAG, DRDO.
5. Pilot Trial proposal of C-DOT GyanSetu Solution submitted to DeitY in December 2015.
6. Techno-commercial proposal of GyanSetu solution for Srikakulam District, Andhra Pradesh submitted to Hon'ble Minister of State for Science and Technology and Earth Sciences in April 2015.
7. Worked for ASCON Phase IV RFP with M/s BEL and M/s TCIL to promote UNMS, MPLS Routers, SIP Routing Engine, GIS, Fibre Monitoring system, DWDM, MSDs and GWs.
8. BBWT and GyanSetu proposal for KEONICS submitted in February 2016.
9. BBWT Order from MS Ramaiah Institute of Technology, Bengaluru.
10. Contract signed between ANURAG, DRDO and C-DOT for the development of RHP (Router Hardware Platform)

Awards received

- C-DOT's GPON solution was adjudged the winner of the 'IESA (India Electronics and Semiconductor Association) Technovation 2015 – most innovative product award' on 3rd Feb. 2016 at Bengaluru.
- 'Recognition of excellence' award for GyanSetu at ITU Telecom World 2015, awarded on 15th Oct. 2015.
- ELCINA-EFY 2014-15 'Certificate of Merit' for C-DOT green power supply unit, awarded on 24th Sep. 2015.



During the year 2015-2016, C-DOT actively participated in Telecommunication Engineering Center (TEC) working groups for M2M Communication and contributed for the technical reports on following released by TEC:

- M2M Gateway and Architecture
- Power Sector
- Safety and Surveillance Systems
- M2M Number resource requirements and other options



EVENTS 2015-16

May

MSRIT Open Day Exhibition
13th - 14th May 2015

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July

Digital India Week
1st - 7th July 2015

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SES Exhibition
30th - 31st July 2015

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Aug

**Foundation Day Celebration
(1st MSME Meet in
C-DOT Campus)**

25th - 26th August 2015

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Sep

Indo-Africa ICT Summit
28th - 29th September 2015

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Oct

ITU Telecom World
12th - 15th October 2015

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Nov

DEFCON
23rd - 24th November 2015

Page No. 20

**C-DOT Licensee-
MSME Meet-cum-Exhibition**

24th November 2015

Page No. 21

Dec

Bengaluru ITE.biz
8th - 10th December 2015

**IEEE MSRIT Seminar &
Exhibition on Smart Sensors**
21st - 23rd December 2015

Jan

**103rd Indian Science
Congress Mysore**
3rd - 7th January

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Indo Expo
20th - 21st January 2016

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24th Convergence India 2016
20th - 22nd January

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Feb

**International Fleet
Review, Visakhapatnam**
4th - 8th February 2016

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**TEPC, 7th International
Buyer Seller Meet, Delhi**
12th - 13th February 2016

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March

**DICCI - 5th
National Fair**
25th - 27th March 2016
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Defexpo India
28th - 31st March 2016
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**C-DOT NGN
Switch launch**
17th March 2016
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MSRIT Open Day Exhibition (13th - 14th May 2015)

The MSRIT Open Day Exhibition was held on 13th - 14th May 2015 in M S Ramaiah Institute of Technology (MSRIT) Bengaluru, India. The event focused on current and future technologies from leading organizations like Defense, Aerospace, Telecom etc.



C-DOT showcased its indigenous technologies like Broad Band Wireless Terminals (BBWT), GyanSetu, Gigabit Passive Optical Network (GPON) ONTs, SGRAN, Terabit Router. A large number of visitors from industry, faculty, and students from various colleges visited the stall with full excitement.

Digital India Week (6th July 2015)

C-DOT has developed indigenous technologies attuned to the sensitive needs of Indian landscape that aim at the digital convergence of rural and urban India with a vast potential for building the citadels of "Digital India". A 'The Digital India Week' was observed during 1st - 7th July 2015 with the launch of Long Distance Wi-Fi System, Solar Powered Wi-Fi System, 100Gbps OFC Link, C-DOT Next Generation Network in MTNL Network by Honorable Minister of Communication & IT,

Shri Ravi Shankar Prasad on 6th July 2015 at C-DOT Campus, Delhi.

Launch of C-DOT Broadband Products



Launch of C-DOT products by Hon'ble MoC & IT and Cabinet Secretary-ICT, Kenya



Visit of Hon'ble Cabinet Secretary-ICT, Kenya



Address by Hon'ble MoC & IT

SES 2015 (30th - 31st July 2015)

The Strategic Electronics Summit 2015 (SES 2015) for the Defense & Aerospace segment was organized by ELCINA on the 30th - 31st July 2015 at International Exhibition Centre, Bengaluru, India. The Strategic Electronics sector presents an unprecedented opportunity as well as challenge



for our country. The strategic electronics segment encompasses Communication Systems, Radars & Sonars, Network Centric Systems, Satellite Based Communication, Navigation and Surveillance Systems.

**Foundation Day Celebration
(25th - 26th Aug. 2015)**

C-DOT celebrated its Foundation day on 25th August, 2015 at C-DOT's Campus in New Delhi. The event was inaugurated by Shri Narendra Kumar Yadav, Member- Services & Technology, Telecom Commission. It was followed by a seminar cum workshop on "Exploring the new horizons of the Wireless, M2M and IoT Firmament" on 26th August, 2015

Shri Vipin Tyagi, Executive Director, reaffirmed that C-DOT is working with a missionary zeal towards making PM Narendra Modi's dream of



Digital India a reality by bridging the digital divide between rural and urban India. The inaugural session was followed by the keynote address by Dr. Boyd McGregor Murray, an eminent Wireless Technologies Expert from Australia and the Foundation Day lecture by Founding Executive Director Shri G. B. Meemamsi, a Padma awardee. An exhibition had been organised to showcase C-DOT's indigenously designed technologies with their live demonstration.

**Indo-Africa ICT Summit & Expo 2015
(28th - 29th Sep. 2015, Nairobi, Kenya)**

In first of its kind event in Africa, C-DOT showcased various products live to African fraternity viz. Long Distance WiFi, Solar WiFi Gyan Setu, Router, GPON etc. Many senior dignitaries including Kenyan minister, Indian High Commissioner to Kenya, Communications Minister of Sudan and





Sudan's Telecom Chief, apex telecom officials from Uganda, Tanzania, Rwanda, South Africa, System Integrators from African countries, Telecom consultants from Kenya and neighboring countries visited C-DOT stall and expressed keen interest in C-DOT products and its unique business model.

ITU Telecom World 2015 (12th - 15th Oct. 2015) at Budapest

C-DOT showcased its products live during the ITU Telecom World 2015 at Budapest from 12th - 15th October 2015. GyanSetu, an innovative product for rural India, received a 'RECOGNITION OF EXCELLENCE' award at the event. Other products like C-DOT's Terabit Router, GPON Solution, 100G OTN Platform and Telecom Geo-Intelligence Solution were also showcased live during the event. Various delegates including Indian Ambassador, Embassy of India; Secretary General, ITU; Minister from Royal Government of Bhutan, Ministry of Information and Technology; Deputy Minister from Zimbabwe and delegates from Kenya, Uganda, Hungary, Tanzania, Kingdom of Saudi Arabia visited the Digital India Pavilion. They appreciated and showed keen interest in technologies developed by C-DOT.



DEFCOM - 2015 (23rd - 24th Nov. 2015)

C-DOT demonstrated its indigenous technologies and innovative strategic solutions at DEFCOM INDIA 2015, India Habitat Centre, New Delhi, from 23rd - 24th November 2015. The aim of the event was to leverage the ICTEC (Information, Communications, Technology, Electronics and Cyber) infrastructure and harness the human capital for Digital Army.



C-DOT Licensees – MSME Meet-cum-Exhibition (24th Nov. 2015)

MSME's contribution to manufacturing sector is about 45% & towards the export sector is above 40% for our country. In cognizance of the importance of value chain generated by MSMEs, C-DOT believes that collaboration of R&D organizations and MSMEs together can make a huge difference in current market scenario.



The meet was organized to appraise MSMEs of our latest technologies. Demonstration of various products like BroadBand Wireless Terminal, Terabit Router, GPON and NMS was given during the event.

103rd Indian Science Congress (3rd - 7th Jan. 2016)

The Honorable Prime Minister of India, Shri. Narendra Modi inaugurated 103rd session of the Indian Science Congress (ISC) at University of Mysore, Mysuru from 3rd - 7th January, 2016 with the theme as "Science & Technology for Indigenous Development in India".

C-DOT displayed its indigenously technologies from the wireless, optical and switching domain. Few of them were Solar and Long range WiFi, GyanSetu, Green Technology, GPON (Chatur Damini with Titli Damak) and 100G Mini OTN, NGN (Terabit Router, DSLAMs, CPEs, VOIP phone),



Geo-Intelligence and NMS. The technologies and applications developed by C-DOT were highly appreciated by the exhibitors alike with technical experts and scientists from various industries and faculty members from several academic institutions, officials from India Post etc.

IND EXPO (20th - 21st Jan. 2016)

C-DOT participated in National Vendor Development Programme cum Industrial Exhibition "IND EXPO" on 20th- 21st January 2016 at Bengaluru.



During the exhibition, several officials from MSME Industry visited the C-DOT stall. Mr. S.N. Rangaprasad, Director, MSME, Bengaluru visited C-DOT stall and was highly impressed by the C-DOT technologies. Officials of various manufacturing firms also visited the stall and showed keen interest in Solar Wi-Fi and Green power Technology.

24th Convergence India 2016 (20th - 22nd Jan. 2016)

C-DOT exhibited its indigenous technologies & innovative solutions at 24th Convergence India held at Pragati Maidan, New Delhi from 20th-22nd January 2016. The focal theme of C-DOT's stall was "Architecting Digital India". C-DOT stall received a great response from business visitors as well as policy makers in telecom domain. C-DOT's exhibits spanned a wide array of technologies including the M2M, Fiber-to-the-desk (FTTD), 100G Optical Link System, Terabit Router, LTE-A, GyanSetu, Geo-intelligence System, NMS, Green Power Source. Visitors were enthralled by the C-DOT's one M2M standards based M2M solution comprising of C-DOT's Common Service Platform – the first of its kind in the Indian telecom market. C-DOT's Green Power Source also captured the attention of the visitors in the perspective of creating smart villages in India where power is a major concern.



International Fleet Review (4th - 8th Feb. 2016)

C-DOT displayed its technical capabilities useful for Indian Navy who hosted the prestigious International Fleet Review (IFR) 2016 at Visakhapatnam from 4th - 8th February 2016. The Honorable President of India, Shri Pranab Mukherjee inaugurated the International Fleet Review at Visakhapatnam wherein various technologies were displayed live at the exhibition, namely, Solar Wi-Fi, Green Technology, GPON (Chatur Damini with Titli Damak), NGN (Terabit Router, DSLAMs, CPEs, VOIP phone)

During the exhibition a lot of people from Defense and Industry visited the C-DOT stall and appreciated the innovative products of C-DOT.



C-DOT TEAM AT IFR with products display

Navy officials from foreign countries also showed keen interest in C-DOT technologies.

7th International Buyer-Seller meet by TEPC (12th Feb. 2016)

C-DOT participated in the 7th Buyer Seller Meet organized by TEPC on 12th February 2016 at Shangri - La's Eros Hotel, New Delhi. The event was organized under the aegis of Minister of Commerce & Industry. The event was graced by Secretary Telecom & Chairman, Telecom Commission and other officials from Department of Communications & Department of Commerce. C-DOT showcased its technologies and interacted with visitors mostly from Africa and South



Visitor from Kenya showed keen interest in C-DOT GPON



Secretary Telecom and Secretary Commerce visited C-DOT stall at TEPC buyer seller meet

America. C-DOT's GPON technology and its variants grasped the attention of the visitors.

C-DOT also demonstrated its various indigenous technologies- Broad Band Wireless Terminals (BBWT), Tera Bit Router, Gigabit Passive Optical Network (GPON) ONTs and Chatur Damini OLT, LTE-A (Femto eNodeB), Video phone call using C-DOT Softswitch and secure phones, GyanSetu, Green power technology and Geo-Intelligent solutions.

DICCI - 5th National Fair (25th - 27th March 2016)

C-DOT participated in the "Dalit Indian Chamber of Commerce and Industry (DICCI)-SC/ST Entrepreneurs - 5th National Trade Fair" at Bombay Convention and Exhibition Centre, Goregaon (East), Mumbai from 25th - 27th March 2016, that was organized to commemorate Dr. B.R. Ambedkar's 125th Birth Anniversary and the successful completion of 10 years of DICCI.

During the event the Honorable Minister of Consumer Affairs, Shri Ram Vilas Paswan and DICCI Chairman, Mr. Milind Kamble visited the C-DOT stall and lauded C-DOT's technologies and rural development initiatives. Few of our



Shri Ram Vilas Paswan Hon'ble Minister of Consumer Affairs, Food and Public Distribution visited the C-DOT STALL



Mr. Milind Kamble, DICCI Chairman at the C-DOT stall



C-DOT NGN switch launch (17th March 2016)

technologies showcased were Solar Wi-Fi, GyanSetu, Green Technology and GPON Ring Architecture.

In an inauguration function at BSNL corporate office, C-DOT NGN SWITCH was launched on 17th March 2016 by Honorable Minister of Communication & IT, Shri. Ravi Shankar Prasad in the esteemed presence of CMD BSNL, Shri Anupam Srivastava, and ED C-DOT, Shri Vipin Tyagi. Other value added services of NGN, Wi-Fi hotspots and phase VII mobile services were also launched at this event.

Defexpo India 2016 (28th - 31st March 2016)

C-DOT's products and solutions received great visibility and appreciation in the 9th edition of Defexpo India during 28th - 31st March 2016 at South Goa.



Hon'ble MoC & IT, CMD BSNL, Executive Director-C-DOT at the launch of C-DOT NGN Switch

C-DOT demonstrated the live integration of its diverse Telecom solutions including the LTE-A, GPON, Terabit Router, NGN Solution, Long Range Wi-Fi, Telecom Geo-Intelligence based Solutions and NMS with a keen focus on the applications pertinent to strategic sectors.

HR INITIATIVES in C-DOT

During the year 2015-16 C-DOT recruited 47 Fresh Engineers, from Computer Science and Electronics & Communication streams, through Campus recruitment at IITs, NITs and other reputed Engineering Colleges.

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 33% of staff members in C-DOT are women.

Existing Policies:

All eligible female staff members are allowed to avail up to 180 days maternity leaves and 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.

C-DOT has introduced the policy on child care leave. This leave has been granted to eligible female staff on their applying for the same.

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 about 100% of the women staff.

Multifunctional allowance is admissible to 36% of the women employees.

Career growth opportunities are available to women employees in C-DOT. In the last 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 17% are women.

In order to address issues relating to Sexual Harassment of women staff at work place, a Committee has been constituted by C-DOT Board to take a fair and justified view of the cases and recommend suitable action on the same.

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) in executive cadres have coverage of Rs. 5 Lakhs with the facility of opting for Rs. 7.5 Lakhs and staff in non-executive cadres have been covered for Rs. 3.5 Lakhs with the facility of opting for Rs. 5.0 Lakhs. The Group Medi-claim policy has been made effective from 1st April 2006.

Grievance procedure has been introduced for C-DOT staff to provide the employees 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 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 such a way to facilitate persons with disabilities to move around freely from one wing to another.



SWACHH BHARAT ABHIYAN

C-DOT observed cleanliness drive as part of the Swachh Bharat Abhiyan in its campus. Officials were asked to maintain the cleanliness of their individual working areas, disposal of all waste papers, unwanted files, junk etc. Competitions were organized for **best maintained block & best maintained workstation** in which all staff

members participated whole heartedly. 60 plants of palm were planted to keep environment clean and green. To take the cleanliness initiative beyond the campus, the main roads leading to the Campus were cleaned on regular basis. The posters affixed on the side walls of the main road were also removed.



PROMOTION OF HINDI in C-DOT

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 well-known author, poet and journalist Himanshu Joshi was invited for "Inse Miliye..." on 2nd September, 2015. A rendezvous with the writer of popular novels like Aranya, Mahasagar, Chhaya Mat Choonna Mann, Kagar Ki Aag etc. gave C-DOTians a chance to meet a person, who, in spite of starting his life in a remote village without any worldly comforts, has made his mark, in the global literary scenario, purely by his dedication, self-motivation and goal oriented hard work. The programme was very inspiring and motivating.

A team of officers from the Department of Telecommunications inspected the implementation and progress of OL in C-DOT, Delhi on 17th July, 2015. They found everything up to the mark and satisfactory.

The month of September, 2015 was celebrated as Hindi Utsav at C-DOT offices at New Delhi and Bengaluru. Many competitions and events were organized during the fortnight 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. The highlight of the Utsav was a dramatic presentation of Bhisma Sahni ke Teen Rang. The ace theatre personality Dr. Devendra Raj "Ankur" directed the play. It has had been very successful in leaving a great impact on everyone and motivated people to once again connect to the literature and books.

A grand Kavi Sammelan was organized during Hindi Utsav. Noted Hasya Kavi and Padma Shri awardee Shri Surendra Sharma, the famous Hasya Kavi Shri Arun Gemini, the popular song writer Shrimati Seeta Sagar, Dr. Vishnu Saxena, Shri Chirag Jain mesmerized the audiences with their heart rending poems.

C-DOT organized a competition- Abhivyakti under the aegis of Town Official Language Committee (TOLI) for all member offices. A workshop on the power of language and presentation was organized for all the participants before the competition. Noted poet and media person Shri Lakshmi Shankar Vajpayee, the Chief News Reader Shri Akhil Mittal and well-known writer, media person, academician and social activist Shrimati Vartika Nanda were invited to judge the competition and share their knowledge and expertise with the participants.



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on Accounts

REPORT OF THE AUDITORS ON THE ACCOUNTS of C-DOT for the year ended 31st March, 2016 and Management's Replies thereto

To:
The Members of
Centre for Development of Telematics (C-DOT)

Sl.No.	Auditor's Observations	Management's Replies thereon
1.	<p>Report on the Financial Statements</p> <p>We have audited the accompanying financial statements of Centre for Development of Telematics (hereinafter referred to as "C-DOT" or Centre), which comprise the Balance Sheet as at March 31, 2016, the Statement of Income & Expenditure Account for the year then ended, annexed thereto, in which are incorporated the accounts of the units of the Centre audited by us and a summary of significant accounting policies and other explanatory information.</p>	<p>Factual position stated.</p>
2.	<p>Management Responsibility for the Financial Statements</p> <p>Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and the financial performance of the Centre in accordance with the Societies Registration Act, 1860 and Generally Accepted Accounting Principles in India. This responsibility includes design, implementation and maintenance of adequate internal control, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.</p>	<p>Factual position stated.</p>

Sl.No.	Auditor's Observations	Management's Replies thereon
3.	<p>Auditor's Responsibility</p> <p>Our responsibility is to express an opinion on these financial statements based on our audit.</p> <p>We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.</p> <p>An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Centre's preparation & fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Management, as well as evaluating the overall presentation of the financial statements.</p> <p>We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.</p>	<p>Factual position stated</p>

Sl.No.	Auditor's Observations	Management's Replies thereon
--------	------------------------	------------------------------

Basis of Qualified Opinion

a. Investments and Loans

During the year, the Centre has made a provision for a sum of Rs. 2600.00 Lacs from the value of the Investments of Rs. 5200.00 Lacs and a sum of Rs. 923 Lacs from the value of loan Recoverable of Rs. 1846 Lacs from C-DOT Alcatel Lucent Research Centre Private Limited, since in the opinion of the management, the outstanding from the Joint Venture is not recoverable and the management has decided to provide for only half of the Balance outstanding during the current year.

In the Current year, the Centre has made a provision for half the value of investment & loan given to CARC as Bad and Doubtful for recovery. As the Government is engaged in deciding the future course of action regarding this Joint Venture, the provision for the balance amount will be decided upon accordingly.

b. Claims Recoverable

Claims Recoverable amounting to Rs. 1,978.41 Lacs are outstanding for long time. Hence, we are unable to comment on their recoverability and provision required against them, if any, and consequent effect thereof on the financial statements.

The amounts under Claims recoverable are considered good for recovery as they are mainly due from Government of India Telecom service provider.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, except for the effects of the matter described in the basis of the qualified opinion paragraph, the aforesaid financial statements give the information required by the Societies Registration Act, 1860 in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India.

Factual position stated.

Sl.No.	Auditor's Observations	Management's Replies thereon
	<p>(a) In the case of the Balance Sheet, of the state of affairs of the Centre as at March 31, 2016 and</p> <p>(b) In the case of the Income & Expenditure Account of the Deficit of the Centre for the year ended on that date.</p>	

For M/s. Bhatia & Bhatia,
Chartered Accountants
(Firm Regn. No. 003202)

Sd/-
(CA R. Bhatia)
Partner
Membership No. 017572

Place: New Delhi
Date: 19.08.2016

For Centre for Development of Telematics

Sd/-
Vipin Tyagi
Executive Director

BALANCE SHEET AS AT 31ST MARCH...

(In Rupees)

	Schedule no.	2016	2015
CORPUS / CAPITAL FUND AND LIABILITIES			
Corpus/Capital Fund	1	3,077,876,125.56	2,829,022,080.29
Current Liabilities & Provisions	2	1,023,979,382.65	1,059,553,201.27
TOTAL		4,101,855,508.21	3,888,575,281.56
ASSETS			
Fixed Assets	3		
Gross Block		5,467,005,671.75	5,393,832,422.04
Less :- Depreciation		4,634,492,699.82	4,453,239,681.64
Net block		832,512,971.93	940,592,740.40
Assets in transit	3	12,184,575.52	5,923,404.00
Capital Work in Progress	4	4,858,512.00	4,656,512.00
Investments-Long Term	5	260,000,000.00	520,000,000.00
Current Assets, Loans & Advances and Deposits	6	2,992,299,448.76	2,417,402,625.16
TOTAL		4,101,855,508.21	3,888,575,281.56
Significant Accounting Policies	14		
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Schedules 1 - 15 form an integral part of the Financial Statements

For and on behalf of the Centre for Development of Telematics

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
Vipin Tyagi
Executive Director

In terms of our report of even date
For BHATIA & BHATIA
Chartered Accountants
Firm Regn. No 003202

Sd/-
CA R. Bhatia
Partner
M.No. 017572

Place: New Delhi
Date: 19.08.2016

INCOME AND EXPENDITURE ACCOUNT

for the year ended 31st March...

[In Rupees]

	Schedule no.	2016	2015
INCOME			
TOT, Royalty, FSR and Publications	7	531,777,199.52	401,841,711.00
Interest Earned	8	61,789,250.57	65,890,407.69
Other Income	9	76,653,334.41	96,175,963.46
TOTAL (A)		670,219,784.50	563,908,082.15
EXPENDITURE			
Establishment Expenses	10	1,455,640,961.00	1,398,954,976.27
Operational Expenses	11	1,203,492,142.78	1,117,595,264.28
Other Administrative Expenses	12	263,601,581.88	241,019,826.75
Depreciation	3	180,853,341.81	227,043,766.94
TOTAL (B)		3,103,588,027.47	2,984,613,834.24
Excess of expenditure over income for the year C =(B-A)		2,433,368,242.97	2,420,705,752.09
Add/less(-):- Adjustments pertaining to earlier years	13	(34,511,538.24)	(4,694,940.71)
Add:- Extraordinary expenses		352,289,250.00	0.00
Balance being excess of expenditure over income		2,751,145,954.73	2,416,010,811.38
Add:- Excess expenditure over income of earlier years		19,375,931,081.83	16,959,920,270.45
Balance being deficit carried to Corpus Fund/Capital Fund		22,127,077,036.56	19,375,931,081.83
Significant Accounting Policies	14		
Notes on Accounts.	15		

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

For and on behalf of the Centre for Development of Telematics

Sd/-
G. Mukundan
Chief Finance Officer

Sd/-
Vipin Tyagi
Executive Director

In terms of our report of even date
For BHATIA & BHATIA
Chartered Accountants
Firm Regn. No 003202

Sd/-
CA R. Bhatia
Partner
M.No. 017572

Place: New Delhi
Date: 19.08.2016

CORPUS / CAPITAL FUND

[Forming part of the Balance Sheet as at 31st March...]

(In Rupees)

	2016		2015	
Grants from Dept. of Electronics (Presently Dept of Information Technology)				
Accumulated balance	335,200,000.00		335,200,000.00	
Grants from Dept. of Telecommunication				
Balance at the beginning of the year	21,869,753,162.12		19,869,753,162.12	
Add:- Contributions towards Corpus/ Capital Fund during the year	<u>3,000,000,000.00</u>	25,204,953,162.12	<u>2,000,000,000.00</u>	22,204,953,162.12
Less:- Balance of net expenditure transferred from the Income and Expenditure Account		22,127,077,036.56		19,375,931,081.83
TOTAL		3,077,876,125.56		2,829,022,080.29

CURRENT LIABILITIES & PROVISIONS[Forming part of the Balance Sheet as at 31st March...]

(In Rupees)

	2016		2015	
CURRENT LIABILITIES				
1. Sundry Creditors				
a) For Goods	317,605,755.78		436,215,111.49	
b) Others	<u>73,263,649.51</u>	390,869,405.29	<u>76,492,346.00</u>	512,707,457.49
2. Advances received				
- For Funded Projects		94,251,349.60		81,069,309.60
3. Statutory Liabilities		26,493,736.51		26,694,674.00
4. Other Current Liabilities		112,098,084.25		105,069,976.18
Sub-total (A)		623,712,575.65		725,541,417.27
PROVISIONS				
1. Gratuity	2,066,834.00		4,206,952.00	
2. Leave Salary	<u>398,199,973.00</u>		<u>329,804,832.00</u>	
Sub-total (B)		400,266,807.00		334,011,784.00
TOTAL (A+B)		1,023,979,382.65		1,059,553,201.27

SCHEDULE 3

FIXED ASSETS

(Forming part of the Balance Sheet as at 31st March, 2016)

(In Rupees)

	Gross Block		Depreciation		Net Block	
	As on 01.04.2015	As on 31.03.2016	As on 01.04.2015	As on 31.03.2016	As on 31.03.2016	As on 31.03.2015
	Additions	Adj./Write-off	For the year	Adj./Write-off		
Land - Free Hold	120,000,000.00	0.00	0.00	0.00	120,000,000.00	120,000,000.00
Building-Office	570,180,967.65	0.00	19,997,363.39	0.00	390,204,697.12	199,973,633.92
Building-Residential	23,627,434.00	0.00	450,692.61	0.00	15,064,274.51	9,013,852.10
R & D Equipment	1,837,657,410.09	0.00	54,693,848.62	0.00	1,534,061,138.16	358,290,120.55
R & D Computers	2,124,397,746.59	954,219.41	83,449,778.35	738,038.67	2,131,299,796.23	77,285,767.38
Office Equipments & Appliances	353,143,242.17	1,579,522.00	10,422,644.10	(107,235.47)	295,529,913.69	67,928,737.11
Furniture & Fixtures	307,506,407.23	3,307,472.00	11,330,441.74	0.00	210,736,219.63	108,100,629.34
Library Books	57,319,214.31	508,573.00	508,573.00	(231,126.83)	57,596,660.48	0.00
Total	5,393,832,422.04	73,097,442.74	180,853,341.81	399,676.37	4,634,492,699.82	940,592,740.40
Assets in transit					12,814,575.52	5,923,404.00
Previous year's total	5,347,520,014.45	133,175,323.60	227,043,766.94	(83,508,602.26)	4,453,239,681.64	1,037,815,497.49

SCHEDULE 4

CAPITAL WORK IN PROGRESS

[Forming part of the Balance Sheet as at 31st March, 2016]

(In Rupees)

	As at 01.04.2015	Additions	Transfer to Fixed Assets	As at 31.03.2016
Campus -Delhi				
1) Campus-Residential Complex	4,656,512.00	202,000.00	0.00	4,858,512.00
Total	4,656,512.00	202,000.00	0.00	4,858,512.00
Previous Year Balance	4,459,882.00	196,630.00	0.00	4,656,512.00

SCHEDULE 5

INVESTMENTS - LONG TERM

[Forming part of the Balance Sheet as at 31st March...]

(In Rupees)

	NO. OF FULLY PAID EQUITY SHARES	FACE VALUE PER SHARE (Rs.)	2016		2015	
UNQUOTED (At cost)						
JOINT VENTURE COMPANY						
C-DOT ALCATEL-LUCENT RESEARCH CENTRE PVT. LTD. (CARC)	52,000,000	10	520,000,000.00		520,000,000.00	
Less: Provision for Bad & doubtful Investments			260,000,000.00	260,000,000.00	0.00	520,000,000.00
TOTAL			260,000,000.00			520,000,000.00

CURRENT ASSETS, LOANS & ADVANCES AND DEPOSITS

(Forming part of the Balance Sheet as at 31st March...)

(In Rupees)

	2016		2015	
A. CURRENT ASSETS				
1 Inventories (As taken, valued and certified by the Management)				
a) Inventory	491,590,903.34		484,544,876.80	
b) Inventory in transit	<u>17,209,230.52</u>	508,800,133.86	<u>3,350,938.39</u>	487,895,815.19
2 Sundry Debtors				
a) Debts outstanding for a period exceeding six months	498,599,545.35		433,009,940.94	
b) Others	<u>290,445,299.92</u>		<u>233,589,936.83</u>	
	789,044,845.27		666,599,877.77	
Less:-Provision for Bad & Doubtful Sundry Debtors	<u>35,933,244.00</u>	753,111,601.27	<u>68,990,982.00</u>	597,608,895.77
3 Bank Balances				
a) With Scheduled banks				
On Current Accounts	342,653.44		0.00	
On Deposit Accounts	767,654,299.28		355,169,281.38	
On Saving Accounts	<u>238,502,926.27</u>	<u>1,006,499,878.99</u>	<u>186,160,298.45</u>	<u>541,329,579.83</u>
TOTAL (A)		2,268,411,614.12		1,626,834,290.79
B. LOANS & ADVANCES				
1 Loans				
a) Staff	9,788,790.00		10,412,582.00	
b) CARC Pvt Ltd	<u>184,578,500.00</u>		<u>184,578,500.00</u>	
	194,367,290.00		194,991,082.00	
Less:- Provision for Bad & doubtful Loan	92,289,250.00	102,078,040.00	0.00	194,991,082.00
2 Advances and other amounts recoverable in Cash or in kind or for value to be received.				
a) Contractors & Suppliers	159,592,635.63		172,876,283.66	
b) Employees	1,942,512.00		3,108,140.00	
c) Prepaid expenses	<u>8,581,530.26</u>	170,116,677.89	<u>10,101,563.12</u>	186,085,986.78
3 Interest Accrued				
a) On Staff Loan	1,660,970.30		1,305,369.21	
b) On Bank Deposits	8,967,182.64		3,435,102.65	
c) CARC Loan	<u>59,858,060.00</u>	70,486,212.94	<u>59,858,060.00</u>	64,598,531.86
4 Claims Recoverable		203,055,376.91		199,160,137.35
5 Tax Deducted at Source		173,607,435.06		128,799,811.44
6 Disputed Income tax		0.00		11,031,283.31
7 Centvat credit receivable		<u>1,622,201.84</u>		<u>2,496,331.63</u>
TOTAL (B)		720,965,944.64		787,163,164.37
C. DEPOSITS				
a) Office Building	40,500.00		40,500.00	
b) Others	<u>2,881,390.00</u>		<u>3,364,670.00</u>	
TOTAL (C)		2,921,890.00		3,405,170.00
TOTAL (A)+(B)+(C)		2,992,299,448.76		2,417,402,625.16

INCOME FROM TOT, ROYALTY, FSR AND PUBLICATIONS

[Forming part of Income & Expenditure Account for the year ended 31st March...]

(In Rupees)

	2016	2015
1) Income from Royalty	1,356,289.00	0.00
2) Income from Transfer of Technology (TOT)	5,400,000.00	6,950,000.00
3) Field/Technology Support Receipts	524,924,410.52	394,804,211.00
4) Income from Publications	96,500.00	87,500.00
TOTAL	531,777,199.52	401,841,711.00

SCHEDULE 8

INTEREST EARNED

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2016	2015
1) On Term deposits with Scheduled Banks	37,140,929.08	30,719,953.79
2) On Saving Account with Scheduled Banks	6,785,003.00	3,737,158.10
3) On Loans to Employees/Staff	1,178,642.09	1,163,236.80
4) On loans to Others	2,221,008.00	2,214,939.00
5) Others	14,463,668.40	28,055,120.00
TOTAL	61,789,250.57	65,890,407.69

SCHEDULE 9

OTHER INCOME

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2016	2015
1) Profit on Sale/disposal of Assets	26,446.00	990.00
2) Miscellaneous Income	38,964,487.93	61,923,752.78
3) Gain due to foreign exchange translation	16,390.48	903,973.68
4) Income from rent	37,646,010.00	33,347,247.00
TOTAL	76,653,334.41	96,175,963.46

ESTABLISHMENT EXPENSES(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2016	2015
a) Salaries and Wages	1,100,247,480.00	1,004,087,365.00
b) Bonus	797,874.00	804,782.00
c) Contributions to Provident Fund	92,601,266.00	88,581,294.00
d) Contributions to other Funds	15,063,613.00	11,602,395.00
e) Gratuity provided for employees	3,566,834.00	42,206,952.00
f) Staff Welfare expenses	222,380,556.00	229,334,856.27
g) Rent on residentials and Maintenance Expenses	17,863,772.00	17,799,105.00
h) Recruitment and Training Expenses	3,119,566.00	4,538,227.00
TOTAL	1,455,640,961.00	1,398,954,976.27

OPERATIONAL EXPENSES

(Forming part of Income & Expenditure Account for the year ended 31st March...)

(In Rupees)

	2016	2015
a) R &D Components & Consumables	179,696,144.28	188,141,333.79
b) Freight & Forwarding Charges	10,800,580.00	13,008,906.00
c) Repair & Maintenance-R&D & Office Equipments	42,771,727.50	40,817,220.49
d) Design, Development & Technology support Expenses	929,790,011.00	829,597,905.00
e) Consultancy, Apprentice & Technical services Expenses	40,371,699.00	44,937,800.00
f) Testing Charges	61,981.00	1,092,099.00
TOTAL	1,203,492,142.78	1,117,595,264.28

OTHER ADMINISTRATIVE EXPENSES

[Forming part of Income & Expenditure Account for the year ended 31st March...]

[In Rupees]

	2016		2015	
a) Travelling and Conveyance expenses		26,186,035.65		24,422,927.35
b) Vehicle hire charges		3,127,980.00		3,086,877.00
c) Rent, Rates & Taxes		4,401,355.00		2,811,460.00
d) Interest Paid		0.00		11,169.00
e) Electricity & Water Charges		101,386,210.00		92,089,651.47
f) Repairs & Maintenance-Others		69,368,065.00		66,052,371.97
g) Newspaper , Periodicals, Journals & CDs		6,356,083.61		7,234,744.14
h) Insurance Charges		765,046.00		643,617.00
i) Printing, Stationery, Photocopy & Admin Consumables		9,862,192.80		7,978,505.41
j) Postage, Telephone and Communication Charges.		14,299,203.48		13,634,039.23
k) Exhibition, Advertisement & Publicity Expenses		18,052,059.73		8,134,645.00
l) Expenses on Conference/Seminar/Membership Fees		2,143,831.51		1,794,764.00
m) Legal, Professional fees & Honorarium		3,961,256.00		4,152,459.00
n) Patent fees		619,846.00		3,318,478.00
o) Remuneration to Auditors				
Audit Fees	301,500.00		300,000.00	
Out of pocket expenses	<u>48,223.00</u>	349,723.00	<u>94,694.00</u>	394,694.00
p) Hospitality/Entertainment Expenses		6,724.00		76,646.00
q) Bank Charges		811,183.18		964,238.37
r) Loss due to foreign exchange translation		1,880,113.26		1,316,709.51
s) Miscellaneous Expenses		3,266.29		260,601.65
t) Loss on sale of Assets		21,407.37		2,641,228.65
TOTAL		263,601,581.88		241,019,826.75

ADJUSTMENTS PERTAINING TO EARLIER YEARS (NET)

[Forming part of Income & Expenditure Account for the year ended 31st March...]

[In Rupees]

	2016		2015	
	Debit	Credit	Debit	Credit
INCOME				
TOT, Royalty, FSR and Publications	0.00	6,037,127.44	0.00	10,479,980.00
Interest Earned	0.00	0.00	0.00	0.00
Other Income	0.00	113,940.00	0.00	211,003.00
EXPENDITURE				
Establishment Expenses	996,610.60	0.00	338,193.00	0.00
Operational Expenses	0.00	12,773,378.23	0.00	4,959,830.10
Other Administrative Expenses	0.00	17,313,612.00	9,335,610.00	0.00
Depreciation	729,908.83	0.00	1,282,069.39	0.00
TOTAL	1,726,519.43	36,238,057.67	10,955,872.39	15,650,813.10
Net Debit/Credit		34,511,538.24		4,694,940.71

SIGNIFICANT ACCOUNTING POLICIES

(Forming part of the accounts for the year ended 31st March, 2016)

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 their 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. Actuarial gains or losses for the defined benefit plan are recognized in full in the period in which they occur in the statement of profit or loss.
- 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

- a) 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.
-

Notes on Accounts

(Forming part of the Accounts for the year ended 31st March, 2016)

PART - A : Balance Sheet

1.0 Fixed Assets

- a. Fixed assets include land at New Delhi measuring 40 acres (Previous Year- 40 acres) which was acquired in 1993 from Government of India. This land has been considered free hold, even though no formal conveyancing has been done in favour of the CENTRE.

2.0 Capital Work-in-Progress

- a. This represents the cumulative expenditure, incurred since 2008-09, on the proposed Housing facility at the Campus at New Delhi, amounting to Rs. 48.59 lakhs as at 31.03.2016. (Previous Year - Rs. 46.57 lakhs)
- b. The expenditure under this head will be capitalized appropriately under "Fixed Assets", upon completion of the Housing Facility.

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

- a. The aggregate of the investments in the equity of a Joint Venture Company engaged in Research & Development in the field of Telecommunications was Rs. 2600.00 lakhs. (Previous Year - Rs. 5200.00 lakhs). As at the end of the year, the net worth of the Joint Venture Company has eroded substantially. Hence, a provision for bad and doubtful Investments amounting to Rs 2600.00 lakhs (Previous Year - Rs. Nil) has been made in these accounts. As one of the Promoters of the Company, C-DOT is awaiting the directive of the Government on the prospects of that Company.

4.0 Current Assets, Loans, Advances and Deposits

- a. Inventory of Components includes:
 - i. An amount of Rs. 277.93 lakhs as at 31.03.2016, (Previous year Rs. 134.11 lakhs) being components which remained unmoved for more than three years on the balance sheet date . The Management is of the view that these components may be required for use in any of the future R&D activities of the Centre.

- ii. The value of Components, which were purchased in the 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. 219.87 lakhs as at 31.03.2016 (Previous Year - Rs. 99.27 lakhs).
- b. Sundry Debtors amounting to Rs. 7890.45 lakhs as at 31.03.2016 (Previous Year Rs. 6666.00 lakhs) includes:
 - i. On account of TOT & Royalty dues of Rs. 2331.43 lakhs as at 31.03.2016 (Previous Year - Rs. 2331.43 lakhs) due from the concerned licensee has been fully met by the value of the land and buildings at Bengaluru belonging to that licensee taken over / occupied by the Centre since 2005. However, formal transfer of land and Building has not been made so far.
 - ii. On account of Royalty dues of one of the licensees, the same are being received in installments. The balance as at 31.03.2016 was Rs. 148.90 lakhs (Previous Year - Rs. 268.90 lakhs).
 - iii. On account of TOT /Royalty dues from other licensees, the balance as at 31.03.2016 was Rs. 104.47 lakhs (Previous year- Rs. 121.39 lakhs).
 - iv. The balance amount of TOT/Royalty dues of Rs. 359.33 lakhs as at 31.03.2016 (Previous Year Rs. 689.91 lakhs), provision for bad and doubtful debts has been made in these Accounts.
 - v. On account of dues for technology/field support services rendered to Telecom companies Rs. 4817.26 lakhs as at 31.03.2016. (Previous Year - Rs. 3217.51 lakhs).
 - vi. On account of rent receivables from Telecom Companies /Research Academy- Rs. 129.06 lakhs (Previous Year Rs. 36.86 lakhs)

c. Loan to CARC Private Limited

The aggregate of the Loans given to the Joint Venture Company engaged in Research & Development in the field of Telecommunications, after providing for bad and doubtful loan is Rs. 922.89 lakhs. (Previous Year - Rs. 1845.78 lakhs). As at the end of the year, the net worth of the Joint Venture Company has eroded substantially. Hence, a provision for bad and doubtful Loan amounting to Rs. 922.89 lakhs (Previous Year – Rs. Nil) has been made in these accounts.

d. Claims Recoverable:

The aggregate of the amount realizable by the Centre as at 31.03.2016, on account of projects undertaken by it for the other organizations/expenses incurred by it, on reimbursement of cost basis, was Rs. 2030.55 lakhs (Previous Year - Rs. 1991.60 lakhs). All these amounts, which are included under "Claims Recoverable", are considered good for recovery. Hence, no provision has been made in respect thereof, while making these accounts.

5.0 Contingent Liability not provided for :-

- a. On account of unexpired letters of credit issued by bankers in respect of purchase orders for procurement of components and equipment – Rs. 70.40 lakhs as at 31.03.2016 (Previous Year - Rs. Nil lakhs)
- b. On account of bank guarantees given by/ on behalf of the Centre of Rs. Nil Lakhs as at 31.03.2016 (Previous Year - Rs. 8.80 lakhs).
- c. On account of pending legal cases, the amount outstanding is Rs. 20.87 lakhs. (Previous year Rs. 20.87 lakhs).

PART - B: Income & Expenditure Account

1.0 Income

A. Interest Others :-

Interest-Others of the current year include an amount of Rs 144.27 lakhs (Previous Year Rs. Nil) received as Interest on Royalty dues from a licensee under Arbitration Proceedings.

B. Miscellaneous Income :-

Miscellaneous Income includes Rs. 222.11 lakhs (Previous Year Rs. Nil) received from South Delhi Municipal Corporation (SDMC) in an appeal filed before SDMC Taxation Tribunal.

2.0 Expenditure :-

A. Employees' Benefits :-

i. Gratuity

The value of liability of the Centre on account of Gratuity in respect of all employees on rolls at the end of the year on actuarial valuation basis was Rs. 4322.34 lakhs (Previous year Rs. 4000.18 lakhs). The net expenditure recognized in the Income & Expenditure account for Gratuity in the current year was Rs. 35.67 lakhs (Previous Year Rs. 422.07 lakhs). The Gratuity Trust, which is managed by a separate Board of Trustees comprising of employees, is discharging 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. The provision for liability, estimated on actuarial valuation basis, in respect of Earned Leave of employees as at 31.03.2016, was Rs. 3982.00 lakhs (Previous Year Rs. 3298.05 lakhs).

B. Bonus

Ex-gratia payment to eligible employees of the Centre, as per applicable policy from time to time is treated as expenditure of the year on an estimate basis. The estimated expenditure provided on account of bonus for the year is Rs. 7.98 lakhs (Previous Year Rs. 8.05 lakhs).

C. Consumption of Components :-

- i. As per the practice followed consistently, the 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 year was Rs. 1796.96 lakhs (Previous year Rs. 1881.41 lakhs).

D. Foreign Exchange Fluctuations :-

- i. The net result of the fluctuations in Foreign Exchange on account of the transactions during the year was a loss of Rs. 18.64 lakhs (Previous Year- loss of Rs. 4.13 lakhs).
- ii. The gains and losses on account of such fluctuations are distinctly disclosed in Schedule 9 and 12 respectively.

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

Income and Expenditure under this head (refer Schedule 13), includes income of Rs. 61.51 lakhs (Previous year Rs. 106.91 lakhs) and expenditure of Rs. (-) 283.60 lakhs (Previous year Rs. 59.96 lakhs).

F. Extraordinary Expenses

In making these accounts, an amount of Rs. 3522.89 lakhs (Previous year Rs. Nil), being the aggregate value of Provision for bad and Doubtful-Investments- Rs. 2600 lakhs and Provision for Bad and Doubtful-Loans- Rs. 922.89 lakhs, made/extended to CARC Private Limited, has been shown as Extraordinary expenses.

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

Sd/-
CA R. BHATIA
Partner
M. No. 017572
BHATIA & BHATIA
Chartered Accountants
Firm Regn. No. 003202

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

Electronic City-I, Hosur Road,
Bengaluru-560 100

Central Bank of India

Sona Towers, 71/1, Millers Road,
Bengaluru-560 100

Our Statutory Auditors

Bhatia & Bhatia

Chartered Accountants
81, Hemkunt Colony, Level-1
Opp. Nehru Place
New Delhi - 110 048

Our Offices

C-DOT

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

C-DOT

Electronic City,
Phase-I, Hosur Road,
Bengaluru-560 100

C-DOT

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



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