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# Information and Communication Technologies: Key to Transform India

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## About the Author



**Lt General (Retd) Davinder Kumar** is a scholar, soldier and a thinker. He retired as the ***Signal Officer-in-Chief of the Indian Army*** in September, 2006, after rendering 41 years of distinguished service. He was the ***CEO & Managing Director*** of ***Tata Advanced Systems Ltd***, the *Tata's* lead vehicle in defence, aerospace, and homeland security from September, 2008 till September, 2011. As part of the high level negotiating team of the Tata Group, he successfully negotiated formulation of JVs with Sikorsky, Israel Aircraft Industries, AGT for homeland security and HELA for microwave components. He was instrumental in setting up the first helicopter cabin manufacturing facility in India from ground breaking to start of manufacturing in 159 days flat. He has been on the ***Board of Directors*** of both Public and Private sector companies and *Member of select Advisory body of Tata Group on Telecommunications and the Steering Committee on Defence of the Tata Group*

An Expert in the Net Work Centric, Information and Cyber Warfare, he was instrumental for the approval and setting up of the *Army Cyber Group* and the *First Information Warfare Brigade* of the Indian Army. He was the Project Director of Army Strategic Communication Network (ASCON) and is the author of the Defence Communication Network (1995), Tactical Communication System (1996), and ASTROIDS besides a number of regional optical fibre and satellite based networks in some of the most inhospitable terrains in the North and East India. *He headed the national study on Cryptography, was a member of the National Committee on spectrum management and Adviser on IT to the state of Madhya Pradesh.*

He has worked with *Indian Space Research Organisation (ISRO)*, *Oil India*, and the *Planning Commission*. He has been an Examiner for the University Grants Commission, on the Court of The Indraprastha University, member of the *Hardware and Human Resource Groups of the IT Task Force* and the Advisory Committee of *National Disaster Management Authority* appointed by the Prime Minister. He was member of the committee which formulated the I T Act;

2000. He is a recipient of five National Awards including the highest for *Distinguished Service of the Most Exceptional Order*.

*He also got the Best Engineer Award in 2005 and is the only serving officer to have been awarded the Fellowship of Indian National Academy of Engineering. He has over 400 papers to his credit and has also been invited to speak at various international fora like RAND Corporation, International Telecommunication Union (ITU), World Battle Space Research Organisation, Brookings Institute, ASPEN Institute, Wharton University and Centre for Strategic and International Studies, Beijing.*

## **Information and Communication Technologies: Key to Transform India**

India lives concurrently in three ages namely agriculture, Industrial and Information with varying instance of overlaps and constant transition from one to another. The Indian society, therefore, is transforming continuously. The challenge is to manage this transformation.

India has long been bedeviled by various divides: between rich and poor, city and village, literate and illiterate, besides larger socio-cultural ones. Much has been written about the digital divide: a new societal schism between those who possess digital devices and have the capability of using them and, on the other hand, those who do not.

It is believed that ICTs can be mechanisms that enable developing countries to not only close the gap but 'leapfrog' stages of development.

One can use Information and Communication Technology (ICT) to serve as a digital bridge, an enabler that not only obviates any digital divide, but helps to reduce many of the other disparities in society.

The Digital Era ushered in by the ICTs and Media has opened up exciting possibilities for India. India realized the potential of ICT for all round development and started building the infrastructure and capacities in the mid-nineties. She is now poised to make a big transformation that will alter the very fabric of society.

While the past few decades of ICT progress has shown significant promise, it has only laid the foundation for what is about to come. We are now at a position where the next wave of innovation in the form of mobile, broadband and cloud will be the catalyst for an entirely new socio-economic model. This new age will deliver growth and prosperity based on greater social cohesion and environmental sustainability.

The resulting Networked Society holds the potential to truly shape the future and leave a positive legacy for generations to come.

ICT has not only empowered individuals, it is an instrument of Governance and central to human life and development. It is a tool for expeditious narrowing of divide in the society and meeting the aspirations of common man.

Establishing a correlation between internet, mobile and growth of a country, a report by the Indian Council for Research on International Economic Relations (Icrier) said that a 10% increase in internet penetration in India can increase the gross domestic product (GDP) by 1.08 per cent while a 10 per cent increase in mobile penetration can increase the GDP by 1.5 per cent.

India has made reasonable progress in the last decade or so towards

- The establishment of Information and Communication Technology (ICT) infrastructure,
- Enhancing the reach of the electronic media and
- Extension of e-services in the finance, health, public distribution and education sectors to ensure better governance

The development has been differential. The situation, however, is changing rapidly with the mobile telephone revolution which is under way and greater penetration of internet.

Let us take stock of some of India's major achievements in the field of ICT thus far.

- India, with nearly a billion mobile telephones, has the second largest mobile subscriber base in the world.
- Thirty percent of these are smartphone users.
- India, at 462 million users (April 2016), again has the second largest number of internet users in the world with more than 30 percent in the rural areas.
- India has the second largest terrestrial optical fibre network by route kilometers in the world.
- India has the largest undersea optical network in the world.

- India downloaded 9 billion applications in 2015 alone.
- More than 90 percent of its population has access to TV which is transforming rapidly into a fully digital service. Indian TV has about 800 channels broadcasting in 14 languages.
- The Passenger Reservation System (PRS) of Indian Railway provides reservation services to nearly 1.5 to 2.2 million passengers a day on over 2500 trains running throughout the country.
- The PRS Application CONCERT (Country-wide Network of Computerized Enhanced Reservation and Ticketing) is the world's largest online reservation application.
- Freight Operation Information System of Indian Railways makes revenue of 40 million dollars a day and operates through 5 data centres.
- India announced her National Policy on Electronics in 2012 to boost electronic manufacturing.
- India promulgated IT ACT 2000 and subsequent amendment in 2008.

The Government approved the **National e-Governance Plan** (NeGP), comprising of 27 Mission Mode Projects and 8 components, on May 18, 2006. In the year 2011, 4 projects - Health, Education, PDS and Posts were introduced to make the list of 27 MMPs to 31 Mission Mode Projects (MMPs).

Central MMPs	State MMPs	Integrated MMPs
Mission Mode Projects		
<ul style="list-style-type: none"> <li>• <u>Banking</u></li> <li>• <u>Central Excise &amp; Customs</u></li> <li>• <u>Income Tax (IT)</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Agriculture</u></li> <li>• <u>Commercial Taxes</u></li> <li>• <u>e-District</u></li> <li>• <u>Employment Exchange</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>CSC</u></li> <li>• <u>e-Biz</u></li> <li>• <u>e-Courts</u></li> <li>• <u>e-Procurement</u></li> </ul>

<ul style="list-style-type: none"> <li>• <u>Insurance</u></li> <li>• <u>MCA21</u></li> <li>• <u>Passport</u></li> <li>• <u>Immigration, Visa and Foreigners Registration &amp; Tracking</u></li> <li>• <u>Pension</u></li> <li>• <u>e-Office</u></li> <li>• <u>Posts</u></li> <li>• <u>UID</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>Land Records(NLRMP)</u></li> <li>• <u>Municipalities</u></li> <li>• <u>e-Panchayats</u></li> <li>• <u>Police(CCTNS)</u></li> <li>• <u>Road Transport</u></li> <li>• <u>Treasuries Computerization</u></li> <li>• <u>PDS</u></li> <li>• <u>Education</u></li> <li>• <u>Health</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>EDI For eTrade</u></li> <li>• <u>National e-governance Service Delivery Gateway</u></li> <li>• <u>India Portal</u></li> </ul>
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## Vision

“Make all Government services accessible to the common man in his locality, through common service delivery outlets and ensure efficiency, transparency & reliability of such services at affordable costs to realise the basic needs of the common man.”

In order to promote e-Governance in a holistic manner, various policy initiatives and projects have been undertaken to develop core and support infrastructure. The major core infrastructure components are:

- State Data Centres (SDCs),
- State Wide Area Networks (S.W.A.N),
- Common Services Centres (CSCs)
- National e-Governance Service Delivery Gateway (NSDG),
- State e-Governance Service Delivery Gateway (SSDG), and
- Mobile e-Governance Service Delivery Gateway (MSDG).

The important support components include:

- Core policies and guidelines on Security, HR, Citizen Engagement, Social Media
- Standards related to Metadata, Interoperability, Enterprise Architecture, Information Security etc.
- New initiatives include a framework for authentication, viz. e-Pramaan and G-I cloud, an initiative which will ensure benefits of cloud computing for e-Governance projects.

Despite the successful implementation of many e-Governance projects across the country, e-Governance as a whole has not been able to make the desired impact and fulfil all its objectives.

The main reasons for this is the **inadequacy of essential pre-requisites**.

Some of these are:-

- Political will resulting in lack of thrust in implementation
- Comprehensive Policy Framework and consequent lack of synergy
- Absence of an empowered and dedicated Organisation
- Non-availability of indigenous technology (HW, SW, Networking, Process re-engineering, change management etc.)
- ICT infrastructure
- Qualified Human Resource particularly for System/Large system integration.
- An electronic eco system and manufacturing base
- Inclusive growth that covers electronic services, products, devices and job opportunities.
- Standards, Audit and Availability
- Training and awareness of users.
- Legal framework and
- Security

India has taken steps to overcome these inadequacies.



In order to transform the entire ecosystem of public services through the use of information and Communication technology, the Government of India has launched a number of flagship schemes and projects with the vision to transform India into a digitally empowered society and knowledge economy.

Projects like Digital India, National Broadband Network (Bharat Net), Make in India, 100 Smart Cities and Aadhaar would change the digital landscape substantially with direct impact on security, governance, transparency and accountability.

### **Digital India**

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. The initial estimates for the Project is 16 Billion US Dollars over the next four years.

The Digital India programme is centred on three key vision areas:

- Digital Infrastructure as a Core Utility to Every Citizen
- Governance and Services on Demand
- Digital Empowerment of Citizens

### **Digital Infrastructure as a Utility to Every Citizen**

- Availability of high speed internet as a core utility for delivery of services to citizens
- Cradle to grave digital identity that is unique, lifelong, online and authenticable to every citizen
- Mobile phone & bank account enabling citizen participation in digital & financial space
- Easy access to a Common Service Centre
- Shareable private space on a public cloud
- Safe and secure cyberspace

## Governance & Services on Demand

- Seamlessly integrated services across departments or jurisdictions
- Availability of services in real time from online & mobile platforms
- All citizen entitlements to be portable and available on the cloud
- Digitally transformed services for improving ease of doing business
- Making financial transactions electronic & cashless
- Leveraging Geospatial Information Systems (GIS) for decision support systems & development.

## Digital Empowerment of Citizens

- Universal digital literacy
- Universally accessible digital resources
- Availability of digital resources / services in Indian languages
- Collaborative digital platforms for participative governance
- Citizens not required to physically submit Govt. documents / certificates

## Programme Management Structure:

- a. **Cabinet Committee on Economic Affairs (CCEA)** for programme level policy decisions.
- b. **A Monitoring Committee on Digital India under the Chairpersonship of Prime Minister**
- c. **A Digital India Advisory Group headed by the Minister of Communications and IT.**

## Pillars of Digital India

The Government of India hopes to achieve growth on multiple fronts with the Digital India Programme. Specifically, the government aims to **target nine 'Pillars of Digital India'** that they identify as being:

1. Broadband Highways

2. Universal Access to Mobile Connectivity
3. Public Internet Access Programme
4. e-Governance – Reforming Government through Technology
5. e-Kranti - Electronic delivery of services
6. Information for All
7. Electronics Manufacturing
8. IT for Jobs
9. Early Harvest Programmes

## Services

Some of the facilities which are being provided through this initiative are Digital Locker, e-education, e-health, e-sign and national scholarship portal and many more as listed below:

As the part of Digital India, Indian government planned to launch Botnet cleaning centers.

### DigiLocker[

Digital Locker facility will help citizens to:

- Digitally store their important documents like PAN card, passport, mark sheets and degree certificates.
- Provide secure access to Government issued documents.
- Provide authenticity services through Aadhaar.
- It is aimed at eliminating the use of physical documents and enables sharing of verified electronic documents across government agencies

### Digital Life Certificates:

The 'Jeevan Pramaan' scheme launched by the Prime Minister Narendra Modi has given a sigh of relief to a million of retired government employees. With this, the pensioner will do away with the requirement of submitting a physical life certificate in November each year and can now digitally provide proof of their existence to authorities for continuity of pension every year.

**Attendance.gov.in**

Attendance.gov.in is a website, to keep a record of the attendance of Government employees on a real-time basis. This initiative started with implementation of a common Biometric Attendance System (BAS) in the central government offices located in Delhi.

**Digital Boost to MGNREGA:**

Another commendable initiative is the digital boost to the flagship rural job scheme MNREGA. A total of 35,000 gram panchayats are covered to ensure better implementation through mobile monitoring system. This initiative will help the implementation agencies with live data from the worksites, an online and real-time updation of database, real-time visibility of the data for complete transparency, and location of assets with geo-tagging for easy verification.

**MyGov.in**

MyGov.in is a platform to share inputs and ideas on matters of policy and governance. It is a platform for citizen engagement in governance, through a "Discuss", "Do" and "Disseminate" approach.

**Twitter Samvad:**

Amongst the most popular initiatives is the Twitter Samvad which will enable the citizens to be the first to know about new government initiatives and actions. It is a service that lets leaders and government agencies communicate with the people through tweets and SMS.

**SBM Mobile app**

Swachh Bharat Mission (SBM) Mobile app is being used by people and Government organisations for achieving the goals of Swachh Bharat Mission.

**Madad (Help):**

Launched by the External Affairs Minister, the portal 'Madad' will enable Indian citizens living abroad to file consular grievances online to address the complaints promptly. The initiative will speed up forwarding and handling of complaints, improve tracking and redressal and escalate unresolved cases.

**eSign framework**

eSign framework allows citizens to digitally sign a document online using Aadhaar authentication.

**SMS-Based Cyclone Warning System:**

As part of the Digital India initiative, this program is to create an SMS-based weather information and disaster alert system. Information on warnings will be disseminated to officials involved in administration, district magistrates/collectors besides fisherman, farmers, and general public.

**Online Registration System (ORS)**

The e-Hospital application provides important services such as online registration, payment of fees and appointment, online diagnostic reports, enquiring availability of blood online etc Example AIMS have started OPD services through e-health.

**National Scholarships Portal**

National Scholarship Portal is a one stop solution for end to end scholarship process right from submission of student application, verification, sanction and disbursement to end beneficiary for all the scholarships provided by the Government of India.

**eMoney:**

The Department of Posts (DoP) has planned to provide electronic money order service to 70% of its total post offices by December. According to officials, this service will enable India Post to remit money next day to the doorstep that earlier took about a week. Also, it will make the whole process secure and fast. People can send a maximum of Rs 5,000 through e-money order. With this, the department has seen a tremendous growth in commission from money order service to about Rs 600 crore in 2014-15, up from Rs 481.6 crore in 2011-12.

**Online Facility for Firms to File Single Return:** In an effort to ease down the complexities of doing business and reduce cost, the Labor Ministry launched an online facility for firms to file a common return on its portal to comply with

as many as eight labor laws at one go. With this, the companies can now file single unified return which will reduce cost of business transaction.

**Online facility to Issue PAN Card in 48 hours:** An online facility under which a PAN card will be issued within 48 hours of applying. Under this initiative, special camps will be organized throughout the country including rural areas to help people get PAN cards.

### **PRAGATI: (pro Active Government And Timely Implementation)**

It is an interactive platform launched by the Prime Minister Narendra Modi for public grievances redressal. It is aimed at monitoring and reviewing programs and projects of the Government of India as well as state government initiatives and also addressing common man's grievances. This step is expected to make governance in India more efficient and responsive.

### **Projected Impact of Digital India**

- By 2019 Broadband in 250,000 villages,
- Universal phone connectivity
- Net Zero Imports by 2020 .
- 400,000 Public Internet Access Points .
- Wi-fi in 250,000 schools, all universities;
- Public wifi hotspots for citizens Digital Inclusion:
- 17 Million youth trained for IT, Telecom and Electronics Jobs
- Job creation: Direct 17 Million, and Indirect at least 850 Million.
- E-Governance & e-Services: India to be leader in providing e- Services across Government, Agriculture, Industry, Health, Education, Transportation etc.
- Create 28,000 Business Process Outsourcing (BPO) seats in various States.
- Set up at least one Common Service Centre in each of the gram panchayats in the state.
- Digital Literacy mission will cover sixty million rural households
- Connect 550 farmer markets in the country through the use of technology

## **National Optical Fibre Network-NOFN (Bharat Net)**

The NOFN will provide nationwide broadband connectivity in the form of “Information Highways” which will help move ideas, information, services, economic transactions and social interactions and have become the carriers and catalysts of development.

Broadband connectivity will carry vital content – education, health services, market intelligence, agricultural information, etc. – that can transform communities

NOFN proposes seven lakh kilometers (700,000) of optical fibre to be laid to connect 250,000 gram panchayats in three years.

It will connect to one million kilometers of optical fibre laid under the State Wide Area Networks (SWAN)

Public Wi-fi spots will be provided around the clusters after that and all villages will be provided with internet connectivity.

The NOFN project is estimated to cost about Rs. 20,000 Cr (3.5 Billion US Dollars).

## **Smart Cities Mission**

- **Smart Cities Mission is an urban renewal and retrofitting program by the Government of India with a mission to develop 100 cities all over the country making them citizen friendly and sustainable.**
- **The Union Ministry of Urban Development is responsible for implementing the mission in collaboration with the state governments of the respective cities.**
- **The government of India has a vision of developing 100 smart cities as satellite towns of larger cities and by modernizing the existing mid-sized cities.**

While each city will have its own plan, large scale application of ICT would be an essential and common feature. This would be in the areas of security, water, energy, garbage, infrastructure and environment management;

extension of citizen based services like education, banking, health, entertainment, transportation; practically everything.

Twenty cities have been selected for the current year through a very transparent and detailed selection criterion. In the next two years 40 cities would be taken up each year.

13 more cities have been added a few days ago due to pressing demand from States.

The financial outlay is 48000 crores (8 billion US dollars) over the next three years from the central budget and similar amount from the States. To start with, each selected city will get 200 crores in the first year and 100 crores for the next three years,

### **ADHAAR Project**

Aadhaar is a 12 digit individual identification number issued by the Unique Identification Authority of India (UIDAI) on behalf of the Government of India.

This number will serve as a proof of identity and address, anywhere in India.

Any individual, irrespective of age and gender, who is a resident in India and satisfies the verification process laid down by the UIDAI can enroll for Aadhaar.

Each individual needs to enroll only once which is free of cost.

Each Aadhaar number will be unique to an individual and will remain valid for life.

Aadhaar number will help you provide access to services like banking, mobile phone connections and other Govt and Non-Govt services in due course.

Aadhaar is:

- Easily verifiable in an online, cost-effective way
- Unique and robust enough to eliminate the large number of duplicate and fake identities in government and private databases



- A random number generated, devoid of any classification based on caste, creed, religion and geography

As of 30 April 2016, 100.9 crore (1009 million) Aadhaar numbers have been issued in the project.

It is the biggest such project in the world.

Expenditure: One billion dollars up to January 2016.

Aadhaar numbers are linked for:

- Direct Bank Transfer of subsidies,
- Opening of bank accounts and other Government schemes for uplifting the poor.
- SIM Cards
- Enrolment of All Prisoners.
- With matrimonial advertisement for profiling of men.
- With voter identification system.

In the LPG distribution alone, The Government detected 3.73 crore (37.3 Million) bogus connections and thus saved Rs 21,000 crores (3.5 Billion US Dollars) in subsidies in the last two years.

Another 15000 crores (2.5 billion dollars) have been saved due to the discovery of 1.5 crore bogus ration cards due to digitization and link up with Aadhar

### **Prime Minister's Jan Dhan Yogna (PMJDY)**

Another massive and the biggest scheme in the world ( Guinness book of world records) to empower the citizens, provide for Direct Transfer of Subsidies and cut out corruption due to middle men as also provide life insurance.

Accounts Opened till 04 May 2016 ---217 million

Debit cards issued --- 180 million

Cards Linked with Aadhar – 98 million

Balance in Accounts--- 6.5 Billion Dollars

### **SAY and ASMITA**

THE HRD Ministry is set to launch a programme next month that would probably be the world's largest student tracking system.

Shala Asmita Yojana (SAY) aims to track the educational journey of close to 25 crore (250 million) school students from Class I to Class XII across 15 lakh schools in the country. In other words, this online database will carry information about student attendance and enrolment, mid-day meal service, learning outcomes and infrastructural facilities, among other things, on one platform for both private and government schools. Asmita stands for All School Monitoring, Individual Tracing Analysis.

The government will track students through their Aadhaar numbers. According to official estimates, almost 65 per cent of school students in the age group of 5 to 18 years have Aadhaar numbers. Those who don't will be given a unique identity number for tracking.

### **Some Other Major ICT Projects**

- Crime and Criminal Tracking Network and System (CCTNS)
- National Land Record Modernisation Programme (NLRMP)
- MCA 21; e-Governance initiative of Ministry of Company Affairs for easy and secure access to Services.
- National Intelligence Grid (NATGRID)

This article gives you a glimpse of India's ongoing Transformation through deployment and exploitation of ICTs, ICT infrastructure and introduced you to some of the major ICT projects under way for national development and empowerment of citizens. India is in the process of creating world class information infrastructure and provide citizen centric services at their door steps. There are many more projects under implementation at the National, States and Ministry/Department levels. Railways alone has 61 major ICT projects under implementation.

India is thus sitting at the cusp of a big digital revolution and hopes to become a very powerful digitally connected nation by 2020.

Image Source:

- <http://www.smartcitiesindia.com>

## **About the VIVEKANANDA INTERNATIONAL FOUNDATION**

The Vivekananda International Foundation is an independent non-partisan institution that conducts research and analysis on domestic and international issues, and offers a platform for dialogue and conflict resolution. Some of India's leading practitioners from the fields of security, military, diplomacy, government, academia and media fields have come together to generate ideas and stimulate action on national security issues.

The defining feature of VIF lies in its provision of core institutional support which enables the organization to be flexible in its approach and proactive in changing circumstances, with a long-term focus on India's strategic, developmental and civilisational interests. The VIF aims to channelize fresh insights and decades of experience harnessed from its faculty into fostering actionable ideas for the nation's stakeholders.

Since its establishment, VIF has successfully embarked on quality research and scholarship in an effort to highlight issues in governance and strengthen national security. This is being actualized through numerous activities like seminars, round tables, interactive-dialogues, Vimarsh (public discourse), conferences and briefings. The publications of the VIF form the lasting deliverables of the organisation's aspiration to impact on the prevailing discourse on issues concerning India's national interest.



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