

# India's Booming Digital Industry

Exploring startup & innovation opportunities in India's paradigm shift to a digitised nation

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Start-up and entrepreneurship



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# India's Booming Digital Industry

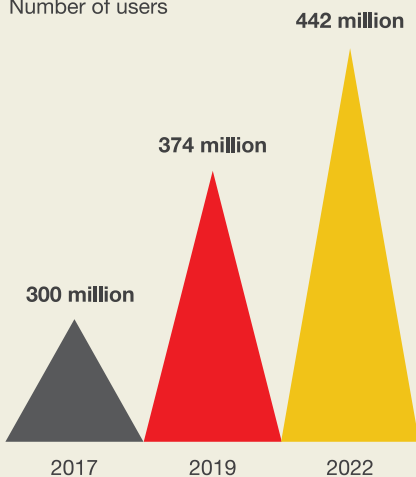
The ICT sector in India is expected to grow by about 11.6% from 2015-19, fueled by a rapidly expanding domestic market, a thriving startup scene, and a large talent pool of engineers.

## INR 38 trillion

Market value expected in 2019

### Smartphone boom

Number of users



### 420 million

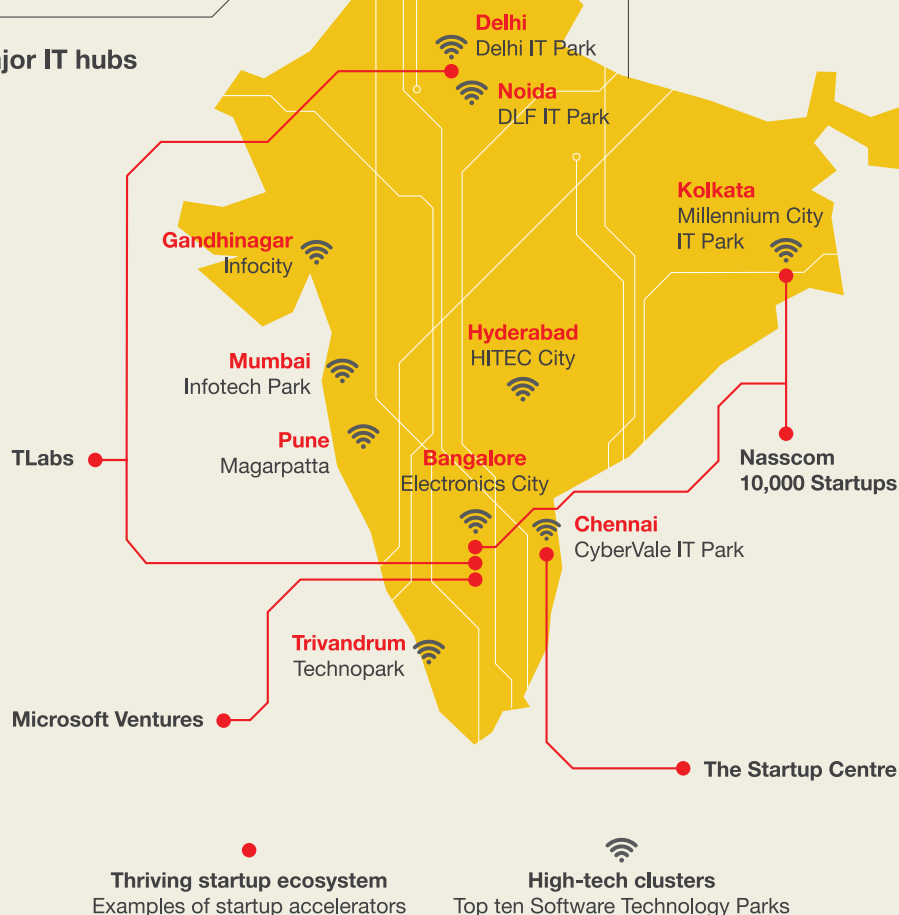
Number of Internet users by December 2017; that's about a quarter of India's population



### ~ 10,000

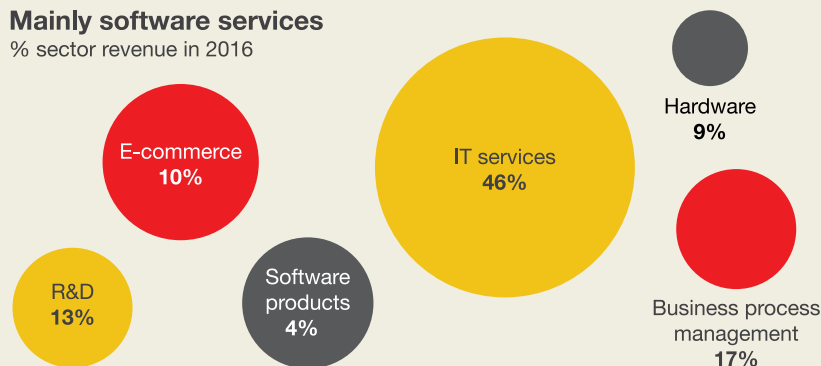
Number of accredited engineering colleges

### Major IT hubs



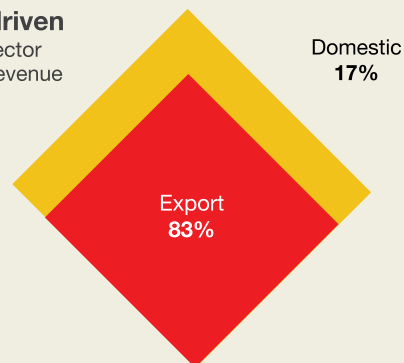
### Mainly software services

% sector revenue in 2016



### Export-driven

% of ICT sector estimated revenue in 2017



### Fast-growing business areas for startups

**Education**  
Expected 5 times of the online education market by 2021

**E-commerce**  
Indian market expected to reach US \$ 64 billion by 2021

**Healthcare**  
Major opportunities in tele-medicine, cloud computing, and service-oriented architecture

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## **EXECUTIVE SUMMARY: THE CURRENT STATE OF THE ICT INDUSTRY IN INDIA AND MARKET OPPORTUNITIES FOR SWISS STARTUPS AND SMEs**

In recent years, India has witnessed a tremendous growth in the ICT sector, with several multinational companies including Small and Medium Scale Enterprises (SMEs) and startups making a foray into the Indian market. IMF's World Economic Outlook report has projected India's GDP growth rate to be at 7.2% for 2017-18 and 7.7% for 2018-19, showing an expansion by 7.1% when compared to the GDP recorded in 2016-17<sup>1</sup>.

The Indian IT industry body National Association of Software and Services Companies (NASSCOM) forecasts the IT sector's export revenues to grow at 7%-8% in 2017-18. Traditional markets such as commerce, healthcare, education, banking and finance, and governance are witnessing a growing trend involving adoption of ICT to improve service delivery and productivity. The boom associated with the domestic ICT sector has spurred a wide range of opportunities for foreign firms to invest in India. India is considered to be one of the major forces in the global economic market as her economy has a major impact on global trading. In the current scenario of globalization, India is perceived as a wonderland for investments due to its huge market base and fast-developing spending habits.

India is a preferred destination for investors over other major countries, because it has a favourable business environment, vibrant democratic setup, a responsive administrative system, attractive foreign policies, availability of abundantly skilled/trained workforce and attractive incentives and return on investments. India has a vast network of technical and management institutions that adhere to the highest international standards.

This report outlines India's ICT sector scenario and gives the reader a succinct overview of various growing facets, the challenges and the opportunities.

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<sup>1</sup> <http://www.livemint.com/Industry/aX59TrzyhLG1sOTtcS5e8I/IMF-keeps-India-growth-unchanged-at-72-in-FY18-and-77-in.html>

# 1.

## India's Digital Initiatives

India has launched a gamut of digital initiatives that aims at transforming the landscape of various services, from being citizen centric to fundamentally transforming governance in India. The following twelve chapters outline these initiatives.

Government of India recognizes the transformative power of technology and marks it as an enabler for change in delivering better citizen services, efficient and productive functioning, digitization of educational records, etc. Use of technology enabled social security platforms could play a vital role in realizing the vision for India's growth.

The figure below explains the initiatives undertaken by the government of India for Digital India program<sup>2</sup>.

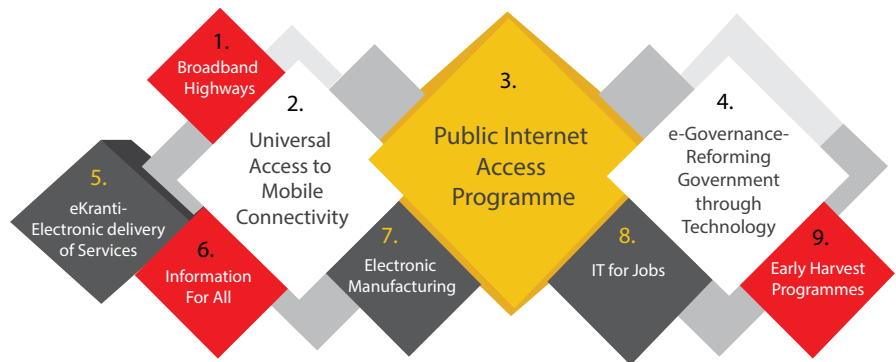


Figure 1

To facilitate collaborative and participative governance, Department of Electronics & Information Technology (DeitY) has launched a digital platform named “myGov”<sup>3</sup>. Moreover, several consultation programs and workshops have been organized to discuss the implementation of the vision areas of Digital India.

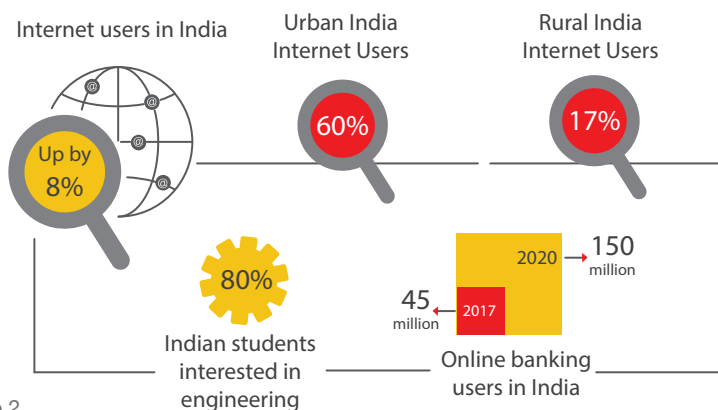


Figure 2

<sup>2</sup> <http://www.digitalindia.gov.in/content/vision-and-vision-areas>

<sup>3</sup> <http://www.mygov.in>

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## 1.1 DigiLocker

Targeted at the idea of paperless governance, DigiLocker<sup>4</sup> is a platform for issuance and verification of documents & certificates in a digital way, thus eliminating the use of physical documents. Indian citizens who sign up for a DigiLocker account get a dedicated cloud storage space that is linked to their Aadhaar (UIDAI) number. Organizations that are registered with Digital Locker can push electronic copies of documents and certificates (e.g. driving license, Voter ID, School certificates) directly into citizens lockers. Citizens can also upload scanned copies of their legacy documents in their accounts. These legacy documents can be electronically signed using the eSign facility.

The platform has the following benefits:

1. Citizens can access their digital documents anytime, anywhere and share it online. This is convenient and time saving.
2. It reduces the administrative overhead of Government departments by minimizing the use of paper.
3. Digital Locker makes it easier to validate the authenticity of documents as they are issued directly by the registered issuers.
4. Self-uploaded documents can be digitally signed using the eSign facility (which is similar to the process of self-attestation).

## 1.2 Twitter Samvad

Twitter Samvad<sup>5</sup> enables any Indian with a mobile device to receive real-time info from their political leaders and government organisations. A simple missed call to an assigned phone number for each government partner means you will be able to receive each Tweet from the partner as an SMS, even if you are offline. Twitter Samvad is able to combine the power of Twitter technology to deliver these messages to anyone with a mobile phone. Since Samvad is built on the technology of ZipDial, an Indian company, this is truly a locally-developed initiative to connect every Indian with a mobile phone to their government and political leaders of 16 existing partner accounts.

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<sup>4</sup> <https://digilocker.gov.in/>

<sup>5</sup> [https://blog.twitter.com/official/en\\_in/a/2015/twitter-samvad-brings-digital-governance-to-the-masses.html](https://blog.twitter.com/official/en_in/a/2015/twitter-samvad-brings-digital-governance-to-the-masses.html)

### 1.3 Unified Portal for Labour Law Compliance

The Unified Shram Suvidha Portal<sup>6</sup> is developed to facilitate reporting of Inspections, and submission of Returns. It has been envisaged as a single point of contact between employer, employee and enforcement agencies bringing in transparency in their day-to-day interactions. For integration of data among various enforcement agencies, each inspectable unit under any Labour Law has been assigned one Labour Identification Number (LIN).

### 1.4 Smart City

India has an ambitious plan to build 100 smart cities<sup>7</sup> across the country. The Government of India has allocated INR 70.6 billion (US\$1.2 billion) for the creation of Smart Cities in Budget 2014–15.

A few smart cities are already coming up across the country, including Kochi Smart City, Gujarat International Finance Tec-City (GIFT) in Ahmedabad, Naya Raipur in Chhattisgarh, Lavasa in Maharashtra and Wave Infratech’s 4,500-acre smart city near New Delhi, Amaravati, Andhra Pradesh.

### 1.5 Smart Grid

Smart Grid technologies are vital to engage country’s particular operating conditions and address challenges like quality power and power losses. Smart Grid vision and roadmap shown below offers series of time-framed, specific and time-driven measures which will help realizing India’s Smart Grid vision.

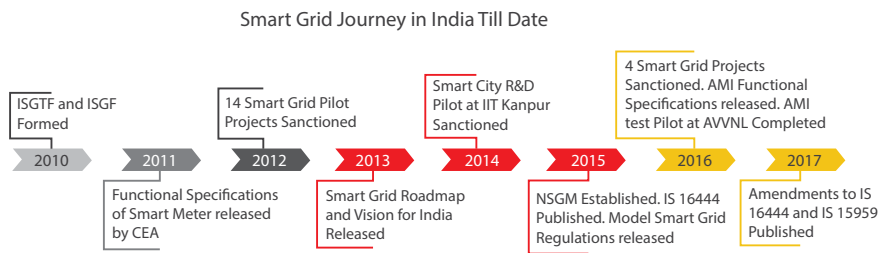


Figure 3

The Indian government aims to address the challenges of power supply in part by using smart grids, energy networks that use ICTs to match supply and demand from multiple sources. However, successful smart grid development is not simply a matter of getting the

<sup>6</sup> <https://shramsuvudha.gov.in/home>

<sup>7</sup> <http://smartcities.gov.in/content/>



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technology right: social embedding, ethical acceptability and institutional support are as important.

The smart grid project is divided into five parts:

- Investigate technical specifications and develop a smart grid prototype
- Identify how smart grids can be embedded and commercialized in the rural Indian energy market, using the Hidden Design method.
- Investigate how societal and institutional factors affect the viability of smart grid implementation and use in India, using an ethnographic approach in combination with insights from transition studies.
- Addresses ethical challenges, especially the question of the degree to which hidden design can replace deliberative processes as a fair and just method of stakeholder involvement.
- Identify which key factors affect the potential for up-scaling smart grids throughout India. The goal of the project is to answer the research question with the actual responsible development and implementation of a smart grid prototype.

## 1.6 Aadhaar

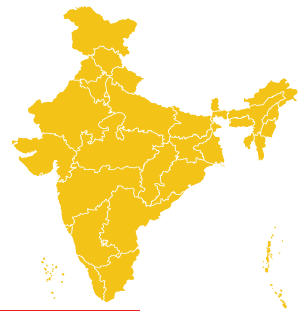
Aadhaar<sup>8</sup> is a 12-digit unique identification number allocated to Indian citizens by the Government of India, issued and managed by the Unique Identification Authority of India (UIDAI), providing a digital identity to everyone. Akin to the Social Security Number (SSN) of USA, the Aadhaar number provides unified access to various governmental services implemented by the Indian government with an aim to better monitor and administer governmental schemes along with accountability.

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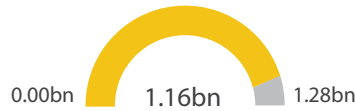
<sup>8</sup> <https://uidai.gov.in/>

Status as on 09.07.2017

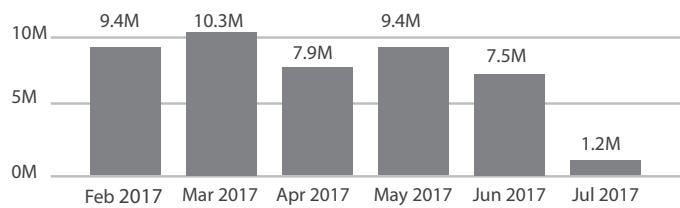
States 36



Aadhaar Generated Vs Population (Projected 2015)

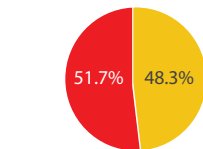


Aadhaar Generation Trend (last six months)



Gender Wise Aadhaar

Female (%) Male (%)



Age Wise Population Vs Aadhaar

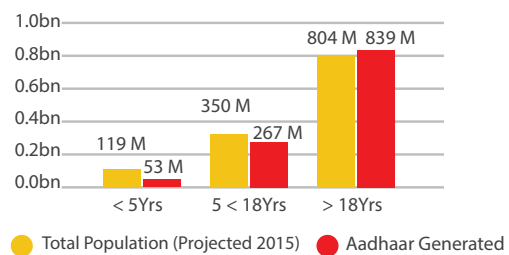


Figure 4

## 1.7 Unified Payments Interface (UPI) & “Bharat Interface for Money”

Unified Payments Interface<sup>9</sup> (UPI), promoted by National Payments Corporation of India (NPCI), is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. It also caters to the “Peer to Peer” collect request which can be scheduled and paid as per requirement and convenience. Each Bank provides its own UPI App for Android, Windows and iOS mobile platform(s). With UPI on the digibank app, one can make and receive payments using Virtual Payment Address (VPA) instead of the account number. UPI is one of the safest modes to pay as your account number is secure and only VPA is shared.

<sup>9</sup> [http://www.npci.org.in/UPI\\_Background.aspx](http://www.npci.org.in/UPI_Background.aspx)

Bharat Interface for Money (BHIM)<sup>10</sup> is a Unified Payments Interface (UPI) based service to enable money transfer using only a mobile number. It is also promoted by Indian Governments' National Payments Corporation of India (NPCI). It is an instant payments application meant for sending money as well as requesting for payments. BHIM-Aadhaar Pay, the merchant interface of BHIM app, would pave the way for digital payments using biometric data - fingerprints or iris scanners - on a trader's device which could be a smart phone equipped with a biometric reader.

## 1.8 India Stack

India Stack<sup>11</sup> is a set of APIs that allows governments, businesses, startups and developers to utilize a unique digital infrastructure to solve India's problems towards presence-less, paperless, and cashless service delivery. The Open API team at iSPIRT has been a pro-bono partner in the development, evolution, and evangelization of the APIs and systems.

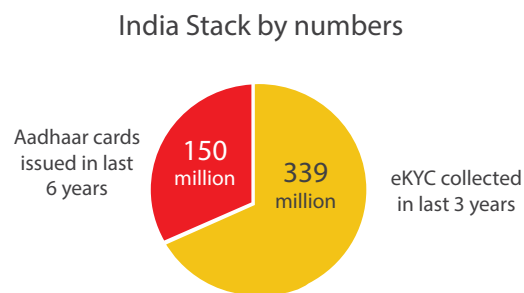


Figure 5

## 1.9 Healthcare

To optimize costs and effectively manage operations, IT solutions have been incorporated as an integral part of process management, patient care and the management information system (MIS) in hospitals. The convergence of healthcare with upcoming technologies such as cloud computing and wireless technologies is likely to play a key role in improving accessibility and meeting the challenge of manpower shortage. The coming years are expected to witness greater deployment of tools such as telemedicine, wearable, point of care devices, Hospital information systems (HIS)/ hospital management information systems<sup>12</sup> (HMIS), etc.

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<sup>10</sup> [http://www.npci.org.in/BHIM\\_Product\\_Overview.aspx](http://www.npci.org.in/BHIM_Product_Overview.aspx)

<sup>11</sup> <http://indiastack.org/>

<sup>12</sup> <https://www.marketresearch.com/product/sample-8801591.pdf>

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The healthcare sector is poised to embrace cloud computing in a big way in the coming decade. Cost-effective cloud-based solutions are expected to drive increased adoption of technologies. The various benefits that can be derived, such as easy accessibility irrespective of geographical location, fewer errors, and fast response in times of emergencies, patient convenience, among others, will drive increased adoption.

## 1.10 Education

The National Mission on Education through Information and Communication Technology<sup>13</sup> (NMEICT) seeks to bridge the gap in the skill sets required to use computing devices for educational purposes amongst urban and rural teachers/learners.

A Central Government Sponsored Scheme with three cardinal principles of access, equity and quality has been formed to leverage the potential of ICT, in the teaching and learning process and to enhance the Gross Enrolment Ratio (GER) in Higher Education by 5 percentage points.

India plans to focus on establishing appropriate disciplines for e-learning, providing facility for performing experiments through virtual laboratories, on-line testing and certification, on-line availability of teachers to mentor learners, utilization of available Education Satellite (EduSAT) and Direct to Home platforms and training and empowerment of teachers to effectively use the new method of teaching learning.

## 1.11 Demonetisation

Indians used cash for upwards of 95% of all payments and 90% of the country's vendors didn't have the means to accept anything but. App and web based applications such as Uber in India accepted cash payments and most ecommerce sites had a cash-on-delivery option.

Demonetization was able to get people to open bank accounts for the first time and to get acquainted with electronic payment systems. The government was able to convince people into using digital payment methods like bank transfers, debit cards, and e-wallets instead of cash.

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<sup>13</sup> <http://mhrd.gov.in/technology-enabled-learning-0>

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## 1.12 Energy

The energy sector is one of the important pillars of economic development in India. Combined with oil and gas, the sector plays a vital role in the country's economy, and it requires pragmatic ICT investments to make significant improvements in the sector.

A NASSCOM-TERI study<sup>14</sup> suggests that one possible solution to the existing challenges in the power sector is to move from a static grid network to a flexible smart power grid which requires bi-directional information flow which can be realized by implementing ICT. The ICT solutions enable one to monitor and control every kWh of power flowing through the system. Such a distribution system seamlessly interfaces with consumer equipment to signal pricing and grid stability conditions.

At the same time, the ICT industry needs to develop cost-effective ICT systems suited to the divergent needs of different utilities. ICT players also have to spread awareness among the end-users about the benefits of ICT interventions and energy conservation.

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<sup>14</sup> [http://www.teriin.org/projects/nfa/pdf/TERI-NASSCOM\\_Green\)\\_ICT\\_Report\\_Dec\\_2011.pdf](http://www.teriin.org/projects/nfa/pdf/TERI-NASSCOM_Green)_ICT_Report_Dec_2011.pdf)

# 2.

## Important ICT technologies: scope, size and opportunities

These seven chapters explore domains in the Indian startup sector that are rapidly gaining prominence and also mention the scope and opportunities.

### 2.1 EdTech

Recent advancements in Information and Communication Technology have led to the streamlining of delivery of quality educational content, effectively reducing and more clearly defining the role of the teacher, who has now become more of a facilitator. The government's National Knowledge Network was a laudable step in this direction as it looked to collect and deliver quality content from top educational institutions in the country, free of cost to anyone with an Internet connection. Online education in India will witness approximately 8x growth in the next five years.

Category-wise split of online education market in India

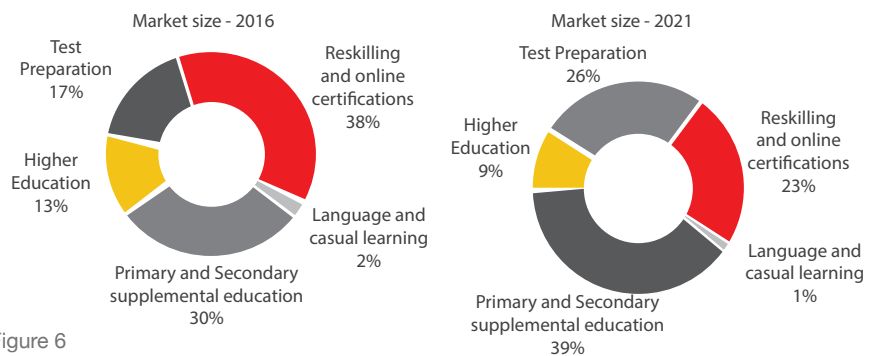


Figure 6

### 2.2 General IoT

Internet of Things (IoT) is playing a major role in the transformation of India into a digital economy, as the catalyst that empowers its citizens by providing them with transparent governance and education, health, legal, financial and safety services. At the heart of this transformation is the re-engineering and digitizing of government processes, using IT and supporting database and cloud infrastructure to simplify, improve and optimize the various government functions their business processes.

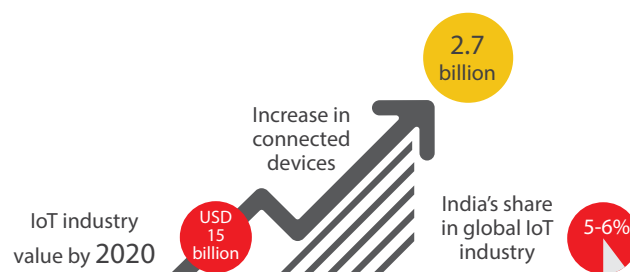


Figure 7

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India aims to develop IoT products specific to Indian needs in the domains of agriculture, health, water quality, natural disasters, transportation, security, automobile, supply chain management, smart cities, automated metering and monitoring of utilities, waste management, oil & gas, etc.

The Policy framework of the IoT Policy has been proposed to be implemented via a multi-pillar approach. The approach comprises of five vertical pillars<sup>15</sup>:

- **Demonstration Centres:** To develop domain specific strategies for IoT including green building, smart grid, industrial monitoring, agriculture, smart cities, healthcare, connected homes, telematics and supply chain, safety and security, forest and wild life, automotive, natural disasters, etc.
- **Capacity Building & Incubation:** Under this program government will fund to create Resource Centers & Test-beds as a common experimental facility supporting heterogeneity in Internet of Things (IoT) domain to help the community to experiment IoT devices and applications by combining various IoT technologies.
- **R&D and Innovation:** In order to stimulate private sector's investment in IoT related R&D and to undertake IoT related R&D projects with international partners, an innovative project named "International IoT Research Collaboration scheme (IIRC)" is to be initiated by DeitY, Government of India. This will be introduced with the support of an aligned association/supporting organization to identify core members of R&D in each field of technology that enables IoT & initiates cloud based open source projects for incessant and collaborative R&D.
- **Incentives and Engagements:** This program is to promote Venture Funds of Electronic Development Fund specifically directed to support companies in IoT related domains like Memory, Processor, Sensors, low power devices and solar electronics. This will be in the form of low/ zero cost funding of eligible projects.

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<sup>15</sup> [http://meity.gov.in/sites/upload\\_files/dit/files/Draft-IoT-Policy%20%281%29.pdf](http://meity.gov.in/sites/upload_files/dit/files/Draft-IoT-Policy%20%281%29.pdf)

## 2.3 Industry 4.0

Industry 4.0 has highly intelligent connected systems that create a fully digital value chain. It is specifically based on cyber physical production systems that integrate communications, IT, data and physical elements. These systems transform the traditional plants into smart factories. Here the objective is to make the machines talk to other machines. Products and information is processed and distributed in real time resulting in profound changes in the entire industrial ecosystem.

In general, there are nine key technological components that progressively make up the foundation of Industry 4.0: Autonomous robots, big data, augmented reality (AR), additive manufacturing, cloud computing, cyber security, IoT, system integration, and simulation. These individual components provide immense opportunities for startups<sup>16</sup>.

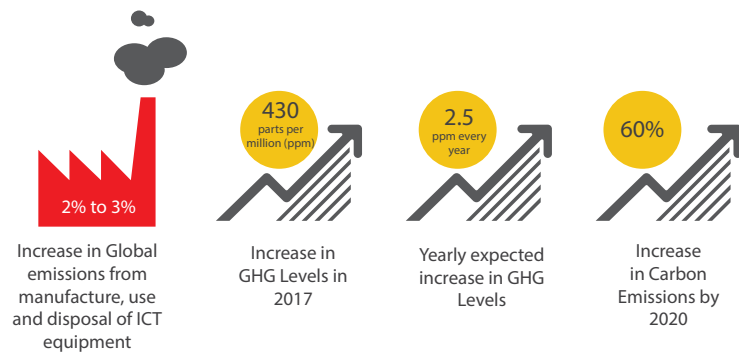


Figure 8 – ICT for low carbon

## 2.4 Cryptocurrency

A cryptocurrency<sup>17</sup> is a digital or virtual currency that uses cryptography for security, which makes it difficult to counterfeit because of this security feature. A defining feature of a cryptocurrency, and arguably its most endearing feature, is

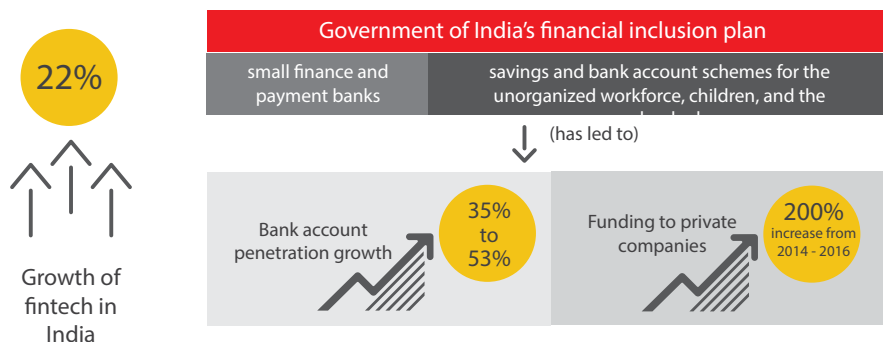


Figure 9 – The India Fintech

<sup>16</sup> <https://www.pwc.in/assets/pdfs/publications/2016/industry-4-0-building-the-digital-enterprise.pdf>



its organic nature; it is not issued by any central authority, rendering it theoretically immune to government interference or manipulation.

As per a BitConnect report, Bitcoin users in India count over 1 Million. In fact, in India, thousands of new users are moving to Bitcoin every day. There are reports that committee of finance ministry officials, IT ministry officials, NITI Aayog, and Reserve Bank officials, may be inching closer to legalizing virtual currencies in India<sup>18</sup><sup>19</sup>.

Over the past few years, a few Bitcoin exchanges have started operating with self-regulated trading platforms with strict Know Your Customer (KYC) and anti-money laundering systems in place. These include startups like Zebpay, Unocoin, etc. In addition, the government initiated a discussion on its forum, MyGov, to seek public opinion on virtual currencies and invite suggestions on it. It also has more than 4000 comments or suggestions.

Additionally, private Bitcoin companies have formed their own association named the Digital Assets and Blockchain Foundation India<sup>20</sup> (DABFI). The self-regulated entity is working towards educating the masses about crypto currencies and informing them about best industry practices.

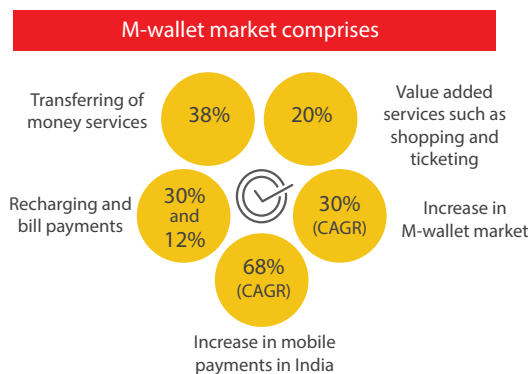


Figure 10 – Mobile wallets

## 2.5 Telemedicine

Growth of a sustainable telemedicine network in India is shaping up with the introduction of legal frameworks, development of national e-health policies, trained human resource and funding. Telemedicine has the potential to revolutionize delivery of healthcare in India if factors such as geographic limitations and poor socio-economic conditions are effectively addressed. Providing quality healthcare to the population (68 per cent) living in remote areas is the greatest challenge faced by the healthcare sector.

<sup>17</sup> <http://www.investopedia.com/terms/c/cryptocurrency.asp>

<sup>18</sup> <https://inc42.com/buzz/bitcoin-cryptocurrency-india-government/>

<sup>19</sup> <https://www.mygov.in/group-issue/commentsuggestions-invited-existing-virtual-currencies-framework/>

<sup>20</sup> <http://dabfoundation.in/>

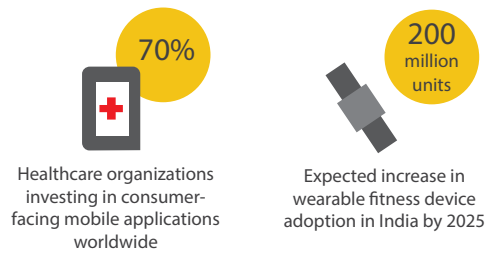


Figure 11 - Wearables

As such, telemedicine is stepping up the process of building up healthcare infrastructure capacities which can be looked upon as an unexplored opportunity by private healthcare industry by offering remote diagnostics as technology and extend the reach of healthcare services and ease the pressure on overburdened systems.

## 2.6 Point-of-Care Diagnostics

Point-of-care diagnostics is a vital part of preventive healthcare and it lays a greater emphasis on screening large numbers of people to prevent the onset of diseases. It can be used for closure of the diagnosis and treatment loop more efficiently. With about 68% of our population confined to rural pockets, point-of-care testing has an even greater relevance in India.

There are a number of new technologies that are helping the spread of Point-of-Care-Testing (POCT)<sup>21</sup>. These include microfluidics, miniaturized sensors and smart-phone based readout and analytics. Interface of microfluidics and new sensors with smart phones can enable home testing and integration with healthcare apps. This integration of technologies is likely to result in creation of new standards for testing over the next 5-10 years.

## 2.7 Blockchain

A blockchain is a continuously growing list of records, called blocks, which are linked and secured using cryptography. The adoption of blockchain technology in stock exchanges and trade platforms in India has been on an increase.

The potential of blockchain technology in automating trade settlements and transactions can prove to be a huge cost saver for financial institutions. The Reserve Bank of India's research arm tested blockchain technology and it is believed to be involved in its first ever end-to-end test of the technology along

<sup>21</sup><http://health.economictimes.indiatimes.com/news/diagnostics/-point-of-care-testing-in-indian-diagnostics-scope-and-challenges/53920988>

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with other stakeholders of the country's financial system.

Though the availability of technology has eliminated multiple processes, large scale implementation of block chain technology is still underway but as the understanding of the technology increases, blockchain will enter the mainstream and be adopted on a greater scale. But there have been doubts whether the technology will start a revolution in global finance as not many banks and financial institutions have committed resources towards the block chain technology despite talking about it for years.

Institute for Development and Research in Banking Technology (IDRBT), an arm of the Reserve Bank of India (RBI) released a whitepaper<sup>22</sup> on blockchains, that have the potential to transform back-end operations of function of banks as well as increasing the speed of payments. The banks concluded that blockchain is likely to bring about a major transformation in the functioning of financial markets, collateral identification, and payments systems.

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<sup>22</sup><https://idrbt.ac.in/assets/publications/Best%20Practices/BCT.pdf>

# 3.

## ICT IP Scenario in India

*Intellectual property holds a prominent role to create value for the startup or enterprise developing various solutions. This chapter highlights the various forms of intellectual property in India.*

Over the year, India is taking dedicated efforts to strengthen IPR (Intellectual Property Rights) to encourage innovation. Intellectual property in India are well protected and controlled by statutory, administrative and judicial framework. In India, intellectual property is broadly divided into two categories: industrial property and copyright. Industrial property includes patents, trademarks, industrial designs and geographic indications while copyrights include creative works like books, poems, plays, films, musical works, computer software and artistic works.

India is also a member of the Paris Convention, Patent Cooperation Treaty and Budapest Treaty. Recently, India signed the Madrid Protocol, which further enhances the applicability of Trademarks in 89 countries. India is a member of the Berne Convention, an international treaty on copyright. India is party to the Geneva Convention for the Protection of rights of Producers of Phonograms and to the Universal Copyright Convention.

### 3.1 Patent

Patent in India are governed by The Patents Act of 1970 and was amended in 1999, 2002 and 2005. Patent is granted for an invention which is “a new product or process, that meets conditions of novelty, non-obviousness and industrial use”. Under the new amendment of Patent Rules, 2016, a new type of applicant “Startup” is introduced in addition to the existing types of applicants - individual, small entity, other than small entity. Other important amendments are expedited examination of the application, hearing via video conferencing modifications.

Indian nationals as well as foreigners can apply for a patent in India. Under the Paris convention, an inventor/assignee can file a patent application within 12 months in other member countries from the date of priority. This period can be extended to 30 months under the PCT (Patent Cooperation Treaty) and the patent application is termed as Internal Phase application. The Indian Patents Act, 1970, clearly prohibits the patenting of software ‘per se’. However, software can be patented in the form of ‘computer related inventions’, if such invention is in conjunction with hardware and solves a technical problem.

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<sup>10</sup> [http://en.wikipedia.org/wiki/Classification\\_of\\_Indian\\_cities](http://en.wikipedia.org/wiki/Classification_of_Indian_cities)

<sup>11</sup> Dazeinfo (<http://bit.ly/1IM37Qx>)

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## 3.2 Copyright

Indian copyright law is based on Indian Copyright Act (1957), which was further amended in 1983, 1984, 1992, 1994 and 1999. It is a right given by the law to creators of literary, dramatic, musical and artistic works and producers of cinematograph films and sound recordings etc. The general copyright term of protection in India is for the life of the author plus 60 years from the beginning of the calendar year following the year in which the work was published. Computer programs and software are covered under literary works and are protected in India under copyrights.

## 3.3 Trademark

Trademarks are the recognizable sign, design, or expression which identifies or distinguishes products or services of a particular source from those of others. The Trade Marks Act 1999 governs the laws pertaining to Trademarks in India, and has been amended further in the year 2010. As a significant change, now Indian Trademark office also allows the registration of well-known marks. To facilitate the faster and effective Trademark registration, the complete Trademark registration process has been digitized and provisions are made for requesting expedited examination/ hearing through video conferencing or any other audio-visual communication. The validity period of registered trademark is for ten years from the date of filing and may be renewed from time to time for an indefinite period by payment of the renewal fees.

## 3.4 Protection of Integrated Circuits Layout Design (IC)

India has now in place Semiconductor Integrated Circuits Layout Design Act, 2000 to give protection to IC layout design. The term of the registration is 10 years from the date of filing an application or from the date of first commercial exploitation anywhere in India or in any country whichever is earlier.

## 3.5 Industrial Design

The existing legislation on industrial designs in India is contained in the New Designs Act, 2000. The industrial design recognizes the creation/original features of new shape, configuration, surface pattern, ornamentations and composition of lines or colours applied to articles that in the finished state appeal to and are judged solely by the eye. The total term of a registered design is 15 years. Initially the right is granted for a period of 10 years, that can be extended by a further period of 5 years by filing an application for extension along with a prescribed fee.

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<sup>10</sup> [http://en.wikipedia.org/wiki/Classification\\_of\\_Indian\\_cities](http://en.wikipedia.org/wiki/Classification_of_Indian_cities)

<sup>11</sup> Dazeinfo (<http://bit.ly/1IM37Qx>)

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# 4.

## Startup Scenarios of ICT in India

*This chapter explores the infrastructure, investment scenario for startups and the success stories of Swiss startups in India.*

### 4.1 Venture Capital/ Investment Scenario

214 Indian tech startups raised about \$1.46 Bn in funding (findings based on the data from those startups that disclosed their funding patterns) in Q1 2017. This is a 25% jump in the number of deals, and a 122% jump in total funding raised, as compared to Q4 2016.

### 4.2 Success Stories of Swiss Startups

SmartCardia, a Swiss startup is tackling prevalent cardiac diseases through a wearable cloud based monitoring solution that notifies dangers in heartbeat like arrhythmia to doctors. swissnex India has helped SmartCardia to launch trials with Manipal Hospitals in India.

Earlier in July 2017, Swiss startup One Visage which offers patented and unique 3D facial authentication technology met with public policy makers and innovation officers of top Indian banks to receive a very positive feedback on use cases within the BFSI industry - a few pilots have already been signed.

A collaboration between the Swiss-based startup Bestmile and Indian company Hi-Tech Robotics Systemz was disclosed during the 2016 Urban Mobility in India Conference. BestMile is providing its expertise and platform for fleet management and optimization of autonomous vehicles while Hi-Tech Robotic Systemz brings its state of the art autonomous technology and vehicles.

Swiss startup Rapyuta Robotics has set up its technology base in India for developing end-to-end industrial grade autonomous drone solution and Enterprise ready cloud infrastructure for platform-as-a-service for robotics.

Swiss startup Alemnis that offers state-of-the-art nanoindentation technology, has been collaborating with India for sourcing since 2015.

Barbara Maim, co-founder and CEO of Minsh moved to India in 2011 along with her husband and co-founder Jon. Started in 2008, Minsh offers customized private social network for your own brand along with a community messaging service.

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## 4.3 Startup Ecosystem and Support

India has emerged as one of the top three countries globally in terms of the number of startups founded. The percentage of global startups able to successfully raise capital in healthcare, consumer healthcare, smart home and home improvement sectors is 41%, 52% and 36% respectively. The corresponding percentages for Indian startups are 5 %, 10 %, and 11 %, which signify a time lag in the setting up and funding between global and Indian startups.

A report by NASSCOM says, 'India has the third-highest number of startup incubators and accelerators (140) in the world after China and the US. The number of incubators and accelerators in India grew by a sharp 40% in 2016, says the report titled 'Incubators/ Accelerators (I/As) Driving the Growth of Indian Start-up Ecosystem-2017'.

Out of the 140 startup incubators and accelerators, 30 have been established under the Start-up India Stand-up India' initiative of the Government of India. Bangalore, Mumbai and Delhi-NCR continue to be the hubs, with more than 40% of the total incubators and accelerators concentrated in these areas. However, Tier-II cities are also gaining traction, with the number in such locations rising a steep 66% over the last year.

The technology sector is supported by the largest number of incubators. After technology, healthcare sector occupies the second position in terms of the number of the incubators supporting it. Telecommunications, industrials, and consumer goods come a close third.

India offers a healthy startup ecosystem for ventures in the ICT sector. While many academic institutions offer incubation support, the Government of India through NSTEDB supports more than 60 incubators across the country. Additionally, the availability of trained engineers as employees for ventures in the ICT sector again supports the startup ventures in this space.

# 5.

## India's ICT Industry

This chapter gives an overview of growth of the ICT industry, the market size and other details.

India's ICT sector (including hardware) was forecasted to generate revenues of US\$ 160 billion during FY16 implying a growth rate of 9.2 per cent. The contribution of the IT sector is approximately 9.5 per cent in FY15.

The Image below gives a broad idea about the market size, expected growth and sector wise breakup of IT industry in India.

Market size of IT industry in India (US\$ billion)

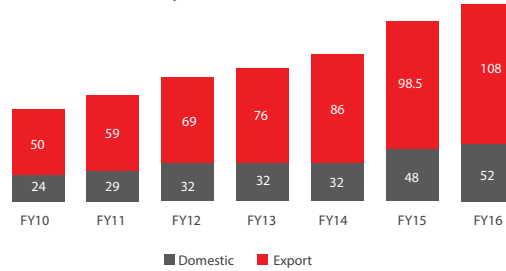
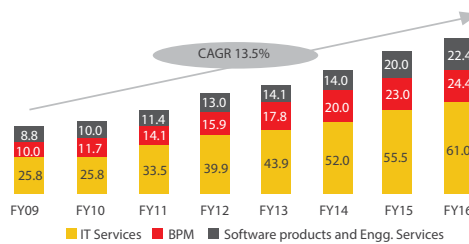


Figure 12

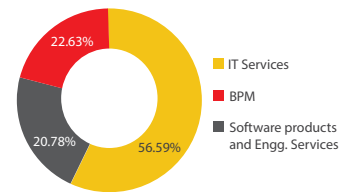
Source: Nasscom, Make in India, TechSci Research  
 Notr: E-Estimates

Growth in export revenue (US \$ Billion)



Source: Nasscom, Make in India, TechSci Research  
 Notr: CAGR – Compound Annual Growth Rate

Sector-wise breakup of export revenue FY16



Source: Nasscom, Make in India, TechSci Research  
 Notr: CAGR – Compound Annual Growth Rate

Overall, across 16,000 firms, the industry has employed nearly 3.7 million people. The IT sector's share in the country's total service exports amount to more than 45%.

According to the European IT observatory EITO, ICT sales growth in 2017 will witness a 5.2% increase in India. In comparison to international ICT markets, India continues to lead in terms of growth rates.

Key growth drivers in ICT sector are improvements in economic indicators, growing disposable income, penetration into rural markets, tier 2 and tier 3 cities, online and digital marketing, the e-commerce boom and the government's reform initiative for the sector. By 2020, India's ICT sector's total revenue is projected to reach USD 200-225 billion and USD 350-400 billion in 2025.

However, despite the robust growth rates, stiff competition, pricing pressure and cheap imports remain key challenges in the domestic ICT market, especially for smaller IT resellers and distributors. Those are mostly partnership/proprietorship companies.



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# 6.

## Employment and Infrastructure Support

*This chapter explores the employment scenario for ICT industry and startups leveraging ICT.*

Employment prospects in the Indian IT sector are expected to be broadly positive and encouraging for the future. It has been asserted that the employment potential of the Indian IT industry is robust as well as promising with the Indian IT companies currently serving two thirds of the fortune 500 companies and creating nearly 4 million direct jobs in India.

Reports from NASSCOM, the principal Industry body, and from other well-known independent organizations and consultants suggesting that India's domestic IT market offers strong prospects for industry growth (consequently employment), even if global markets were to face challenges, also confirmed that the industry continues to be a net recruiter and reports that:

- 2.5-3 million new jobs will be created by 2025.
- In FY 2017, the Indian IT industry added 1,70,000 new jobs.
- Indian IT industry added 600,000 new jobs in the last three years, and today boasts of a total employee base of 3.9 million.
- In 2016, Indian technology startups employed 95,000 to 100,000 IT professionals, across more than 4,750 startups (including ecommerce and hyperlocals).
- Total direct employment is 4 million with the total indirect employment being approximately 10 million in the IT/ ITES Industry.

All the consumer electronics majors including Apple and Samsung are either manufacturing or ready to manufacture in India. Around 72 new mobile phone manufacturing units have been established in the last 30 months thereby creating 0.1 million direct jobs and 0.3 million indirect jobs in India. Ministry of Electronics and Information Technology (MeitY) has also devised India BPO promotion scheme which is expected to provide employment to 0.45 million job aspirants from the small towns.

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# 7.

## Challenges for Digital Transformation & the Future

*Spearheading digital transformation has its challenges for deployment & acceptance. This chapter explores the future and the challenges for implementing the digital transformation*

The ICT landscape will be completely transformed by 2020 on the demand side. This will call for transformation of business models, infrastructure and talent on the supply side. New opportunities will appear, calling for talent development. According to estimates, the ICT sector will create employment opportunities for 28 million (30 million according to another estimate by NASSCOM) by 2020. Of this, 2.7 million will be from the high-caliber pool that will be directly employed in the Electronic System Design & Manufacturing (ESDM) sector. The draft National Policy on Electronics 2011 strongly recommends that the electronics manufacturing industry work closely with the private sector, universities and other institutions of learning to design programs that deliver industry-led training that can create the required talent pool for the industry.

Extending infrastructure investments deeper into the country is one of the vital factors for ensuring a good penetration of ICT technologies in the country. Infrastructure initiatives need to be extended beyond the top cities into Tier 2 and Tier 3 cities, and deeper into the semi-urban and rural parts of the country that are home to 70 percent of the population and represent an estimated 50 percent of total household consumption. The challenge is not trivial—India's rural population is dispersed across more than 600,000 villages, organized in more than 6,000 sub-districts called blocks, administratively controlled by nearly 600 small towns known as district headquarters. Infrastructure expansion efforts could extend to semi-urban and rural areas by accelerating existing government initiatives such as the National Optical Fibre Network (NOFN) that is planned to connect all settlements with a population of over 500, and the Draft National Telecom Policy that aims to provide 175 million broadband connections by 2017.

SMEs cite lack of education about using the Internet and ICT technologies as the top factor constraining the adoption of web technologies. Low internet penetration in rural and semi-urban areas implies that large sections of the population lack familiarity with the use of PCs and web-based devices. The Internet ecosystem in India still has a long way to go to provide local language and text-to-speech support for its contents, devices and applications. The list of top ten languages on the Internet does not include an Indian language, despite the large population that speaks the country's major languages. There is also a need for simpler and more intuitive mobile applications and services with simple graphical interfaces, and strong local language support, such as an India-specific mobile operating system, or an agricultural application for farmers with an image based user interface. This

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need offers a potential opportunity for innovators; it could significantly improve usage among new mobile Internet users.

The scale of the opportunity offers a wide scope for government and private enterprises to collaborate. With work to be done in multiple sectors and the nature of work falling into many categories, a lot of excitement could be generated by channelling the efforts from multiple sectors effectively towards achieving a widespread implementation of ICT technologies in the country.

As stakeholders and difference-maker, three broad non-exhaustive, but indicative, categories emerge:

- **Policy makers:** They hold the key to setting up an effective business environment and aiding the progress of programs of inclusion. An ecosystem in which a business can start and scale up quickly, and then maintain itself is absolutely critical for pushing other initiatives forward. Digital inclusion will accelerate flagship programs in agriculture, energy, employment, education and healthcare to help set up India for more equitable development.
- **Large private enterprises:** They could play a critical role in building the infrastructure to connect people to the Internet and enable ICT technologies. By utilizing their dominant position in the telecom sector or via public—private partnerships, they are well-suited to provide access at an affordable rate to the rural population. In addition, they could play a key role in helping to incubate and mentor new Internet-driven ideas, and promote digital literacy and awareness.
- **Innovators and Entrepreneurs:** A steadily growing and exciting aspect of the Indian ecosystem, they have the potential to improve the supply of products and services that will become available as ICT penetration increases, and the semi-urban and rural populations gain access to technology. Existing solutions need to be tailored for these groups, local language support being one of the most significant requirements. The breadth of these offerings should be expanded to focus on areas such as agriculture, utilities, education and health care.

The scope and scale for digital transformation in India is clearly tremendous. 40% of the business leaders surveyed believe that they have a full strategy in place and are well on their way to transforming their business. 53% of the entrepreneurs believed that they were progressing in their digital transformation journey, and 7% were found to have limited or no strategy.

# 8.

## Conclusion

The 2017 Global Innovation Index<sup>23</sup> ranks Switzerland No: 1 globally and in the Europe region. India on the other hand is ranked No:1 for the Central and Southern Asia region. Switzerland known for its technological innovation and India known for its frugal innovation, offer tremendous scope to develop or adapt high-tech innovations en-masse.

Recent foreign collaborations (for ex: India-Israel Global Innovation Challenge<sup>24</sup>) and piloting of advanced foreign technologies (for ex: cleaning of drains in the Indian state of New Delhi<sup>25</sup>) reinforces the fact that India is welcoming innovations and innovators from outside of the country.

To be successful in India, the Swiss startups will have to understand Indian culture and the need of the Indian consumer and businesses, and invest in local talent or joint-venture approaches with Indian companies. The important factor to consider for Swiss startups will be to learn to do business the Indian way by understanding the Indian market. Rapid Internet and mobile penetration, increasing demand for technology related services, a large number of small and medium sized businesses, favourable government policies and regulations makes India one of the most ideal destinations for investment.

Every component in the startup ecosystem including angel investors, incubators, large enterprises and the government has made the business environment conducive to achieve scale.

It is important that Swiss startups seeking growth opportunities in India have a long- term vision as far as India as a potential market is concerned. Several international companies' revenue in India has grown by 7 to 15 percent compounded annually in past ten years - almost twice the rate of the parent company in the same period.

Thus, blend of factors like economic growth, favorable government policies and technical talent is making India a coveted destination for international startups. These trends are likely to continue in the foreseeable future and Swiss startups have tremendous opportunities to expand in India.

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<sup>23</sup> <https://www.globalinnovationindex.org/gii-2017-report>

<sup>24</sup> <https://www.startupindiahub.org.in/content/sih/il/innovation-challenge.html>

<sup>25</sup> <http://pib.nic.in/newsite/PrintRelease.aspx?relid=161675>







