CYIENT

INDIAN IT INDUSTRY

"Indian Talent + Information Technology = India Tomorrow"

-PM Narendra Modi

- **B.V.R. Mohan Reddy**
  Founder & Executive Chairman, **Cyient** Ltd
  Past Chairman, **NASSCOM**
  Chairman, Board of Governors, **IIT-Hyderabad**
  Honorary **Consul for Germany** (Telangana and Andhra Pradesh)

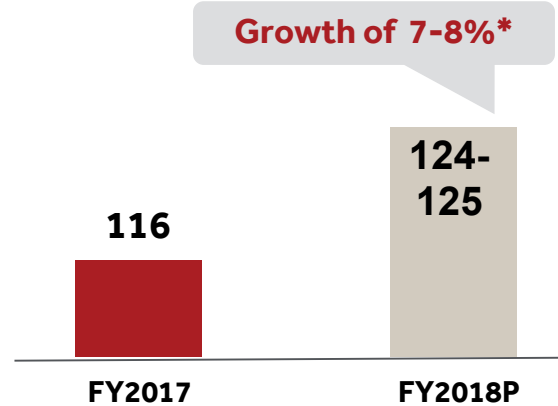# IT: Constantly delivering business impact and innovation

Reimagine →

5 Innovation

4 Business impact

3 Business solution

2 Operational excellence

1 Lower cost

Characteristics

"Do it cheaper"	"Do it better"	"Do it differently"	"Improve business"	"Transform business"
Staff augmentation	Best-in class processes	Distinctive IP and domain expertise	Business KPIs	New business models
Arbitrage led	Consistent quality	Redesigned processes	Accountability for outputs/ outcomes	Digital Disruptive
Lift and shift	Performance SLAs		Risk transfer	

1970...

2000...

2003...

2008...

2010...

Key take away: India Tomorrow is Digital, Innovation and Technology

GDP Share	**Highest relative** share in national GDP and continues to grow	**>9.3%**
Employees	**Largest** private sector employer adding over 350,000 jobs every year	**3.7 mn**
Diversity and inclusiveness	Ardent **promoter** of diversity and inclusivess	**>1.3 mn** Women
Exports	**Largest** share in total services exports	**>38%**
Market Share	**Leading** global sourcing destination	**56%**
Entrepreneurship	**3rd Largest startup** hub in the world; 9 Unicorns	**4,200+**

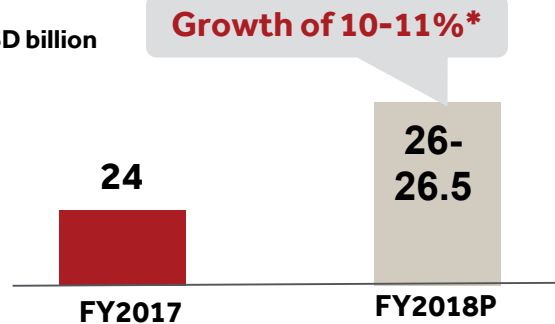# India IT Industry Outlook: 7- 8% projected Export growth; Domestic to grow faster at 10-11%

India IT-BPM Export Revenues*

USD billion

Growth of 7-8%*

FY2017	FY2018P
116	124-125

India IT-BPM Domestic (excl Hardware) Revenues*

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Growth of 10-11%*

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24	26-26.5

* Excludes hardware
Source: NASSCOM

* In constant currency

- **FY18 growth drivers:**
  - Financial services revival with Fed increasing rates

  - Higher growth in new Digital business

  - Legacy business improvement

  - Increased automation based projects driving deals

  - Customers looking for integrated digital capabilities

  - India market growth driven by enterprise digital adoption

- Industry will continue to be net hirer adding **1.3 - 1.5 lakh new jobs; technology skill demand in other sectors to grow at a higher rate**

Indian IT Industry: Aspiration to reach USD 350 billion by 2025
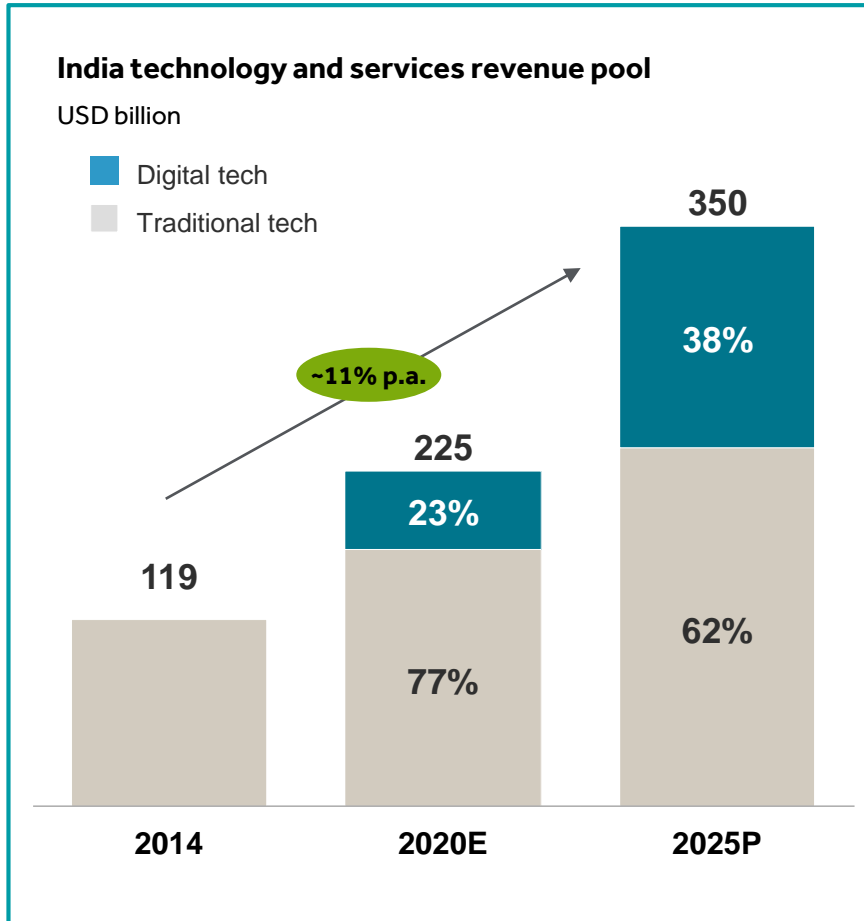
India technology and services revenue pool
USD billion

- Digital tech (blue)
- Traditional tech (grey)

~11% p.a.

	2014	2020E	2025P
Total	119	225	350
Digital tech		23%	38%
Traditional tech		77%	62%

- Global enterprise tech spend will rise to USD 4 trillion by 2025, **80 per cent of incremental tech spending will be digital**

- Indian technology services revenue projected to reach **USD 350 billion by 2020, CAGR of 11 per cent**

- Successful Indian firms will have to fundamentally **transform their business models, solution offerings, organisation and capabilities** to establish leadership

- **Revenue growth not the only indicator of India's tech leadership; factors such as investment, valuations, etc. may need to be considered**

Five forces changing the world at an unprecedented pace and scale

1 Rise of emerging markets

2 Ageing of the global population

3 Power of disruptive digital technologies

4 Integrating world

5 Return of (geo)-politics

Digital world: Developed through computers, enhanced by the Internet, and amplified by sensors and data

- **In the 1970s and '80s,** brought us integrated circuits—tiny processors and memory on microchips that miniaturized and greatly speeded calculation. The economy for the first time had serious computational assistance. Modern fast personal computation had arrived.

- **In the 1990s and 2000s,** Computers got linked together into local and global networks via telephonic or fiber-optic or satellite transmission. The Internet became a commercial entity, web services emerged, and the cloud provided shared computing resources. Everything was in conversation with everything else. Modern globalization had arrived as a result of connectivity.

- **From late 2000s into early 2010s,** Something that at first looks insignificant: cheap and ubiquitous sensors. These sensors brought us data—oceans of data—and all that data invited us to make sense of it. If we could collect images of humans, we could use these to recognize their faces. If we could "see" objects such as roads and pedestrians, to automatically drive cars.

- **From 2010's to present**, the development of methods, intelligent algorithms, for recognizing things and doing something with the result. And so we got computer vision, the ability for machines to recognize objects; and we got natural-language processing, the ability to talk to a computer as we would to another human being. We got digital language translation, face recognition, voice recognition, inductive inference, and digital assistants.

- • **This is the new DIGITAL WORLD.**

Impact of Digital Revolution

- The digital revolution has launched a new era of human empowerment and engagement across **business, society and in every aspect of our lives.**

- Never before has there been a more powerful **influence on human behavior, irrespective of country or culture,** than the combined effect of digital technologies.

- The effects of this shift on society are tremendous and, in particular, are dramatically **changing our leadership responsibilities** whether in politics, professionals in business, teachers in school or parents raising children.

- The age-old importance of geographical locality fades. Indian IT industry is great example which has changed the landscape of SW development around the world.
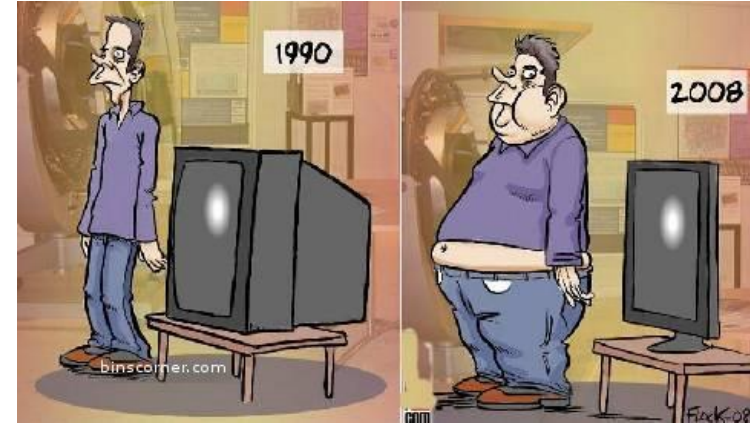
- Convergence of Technology: Has added lot of functionality at the same time reducing the over all cost to a fraction. It has also influenced the customers to accept new technologies.

- **Embrace digital transformation. You can't keep away from it. You either disrupt or are disrupted.**

Factors are amplifying technological acceleration:

- **Cheap access to technology:** The three fundamental technologies of computation, storage, and connectivity are becoming exponentially faster cheaper and smaller

- **Increased comfort with Technology:** Business users now expect the same ease of use in their workplace technologies that they experience with their personal devices, revealing technology's huge influence(whatsapp, gmail)

- **Competitive advantage of technology:** Technological innovations are now the fastest means of opening up new revenue streams and transforming traditional industries. Companies that are technology leaders are twice as likely to achieve rapid revenue and profit growth as the laggards.

- **Multiplier Effect of Technology:** Individual technologies build on each other and amplify each other's effects, setting the stage for what some are calling a "fourth industrial revolution." (Uber & PayTM).

- **Globalization of Technology:** Developed and developing world collaborating, communicating and consuming similar technology platforms spurring global innovation.

- **Innovation:** In an era of digital transformation, ability to challenge the status quo, take risks, become highly persuasive, openness to new ideas, patience and tenacity and trust in oneself has made innovation accelerate. differentiate and adapt to the ever changing global environment.

- **Entrepreneurship:** Technology has multiplied the opportunities available to the entrepreneurs of this digital age. Access to capital, mentorship and conducive business environment has led to growth in startups across the globe.

Technology is Enabler

IoT: We have blood-chemistry sensors, pressure, temperature, flow, vibration, radar and lidar sensors, gyroscopic sensors, magnetic sensors, and moisture sensors, by the dozens and hundreds all meshed together into wireless networks to inform us of the presence of objects or chemicals, or of a system's current status or position, or changes in its external conditions. These when connected together, become IoT and support real-time decision making in mission critical applications.

Pratt & Whitney's Geared Turbo Fan (GTF) engine is equipped with 5000 sensors that can generate 10 GB/s. A single twin engine aircraft with an average of 12 hours flight can produce 844 TB (that's with T) of data.

Robotics: Traditionally Robotics were in use on shop floor specially in handling hazardous processes such as welding, painting and chemical processes. Today, From swarms of "microbots" to self-assembling modular robots to strength-enhancing robotic exoskeletons, applications using robotics cut across industries and transform the way work is done.

A good example can be : minimal invasive surgery. Robotic surgery effectively addressed the limitations of laparoscopic and thoracoscopic procedures, thus revolutionizing minimal access surgery. Robotic surgery is expected to continue to comprise a growing part of surgery. It is envisaged that almost all surgery can and will be performed by robotic surgery in the future.

Technology is Enabler

UAVs: The largely automated flight planning and image processing software promises more real-time solutions, and could particularly re-write how the AEC community monitors projects under construction, and how farmers keep track of crops. There will be a great many service businesses and applications that benefit from this monitoring and mapping technologies, pushing broader use in yet untapped markets.

Drones solutions are finding extensive usage with farming specially for soil and field analysis, planting, crop spraying, crop monitoring and irrigation related assistance. Drones with hyperspectral, multispectral, or thermal sensors can identify which parts of a field are dry or need improvements

3D Printing: Using 3D printing now any complex geometry that can be modelled using CAD, can be printed. It helps producing complex parts that's impossible otherwise using conventional manufacturing processes. No special tooling or preparation needed leading to significant reduction in lead time which has become "Design today, print the part tomorrow". 3D printing is helping in customized mass production of complex products and parts.

Using 3D printing or Additive Manufacturing, now any complex geometry that can be modelled using CAD, can be printed. A good example is 3D printed organs. 3D printing has been used to print organs from a patient's own cells. This means that patients may no longer have to wait a long time for donors in the future.

Disruption in Automobile Industry: Tesla

Design: Tesla designers started with a clean slate, they were able to develop the car around its electric powertrain and battery.

The 'frunk': Tesla integrated the charger, power inverter, electronic controls and, sometimes, the electric motor that left room under the "hood" for a storage compartment

Fuel storage: There's no fuel tank on a Tesla. There is a very large battery pack, which contains the energy storage cells as well as a cooling system.

Instrument panel: Other cars give drivers lots of knobs, switches, soft-touch buttons and even joysticks to contend with. Tesla puts almost everything onto a massive, center-mounted, 17-inch display screen.

Propulsion system: Most cars have hundreds of moving parts, require regular maintenance and can't be adjusted without a trip to the shop. Teslas has two moving parts and single-speed "transmissions" that have no gears.

The batteries: Tesla cells, use a nickel-cobalt-aluminum-lithium chemistry, have about 50% more energy density than other BEV cells, providing long range and high performance.

Wireless updates: Pretty much alone among all automakers, Tesla regularly provides software updates for its cars and delivers them wirelessly at the driver's convenience.

The Tesla Revolution: Building a Sustainable Energy Ecosystem

Solar Power Roof Tiles: Tesla's new solar roof tiles are the latest game-changer in the race to harness the power of Sun. They're more durable than current clay and even slate tiles, and provide full solar coverage in an inconspicuous package.

The solar tiles use a layered system, with high efficiency solar cells overlain by tempered and colored glass to blend in with the roof.

Powerwall 2: Tesla's second generation Powerwall packs twice the energy of version 1.0- a compact, 14 kwh battery unit with a built-in inverter, that's capable of storing excess solar energy and supplying the power needs of a 2-bedroom home for an entire day.
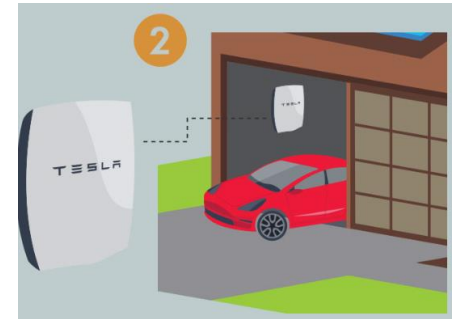
Tesla Model 3: With energy collected by solar roof tiles, and stored as usable power in the Powerwall 2, it's possible to charge up Tesla's all-electric Model 3, which is planned to enter production in 2017.
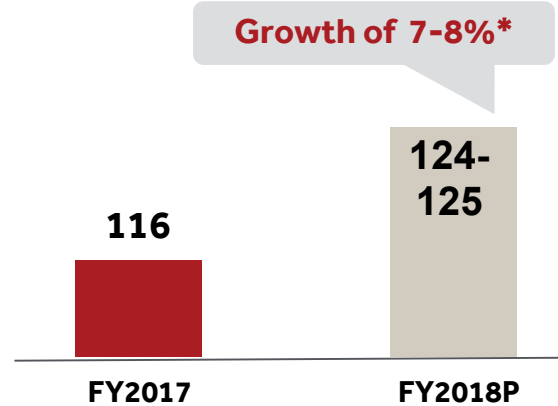
Aside from its impressive range of 215 mi/ charge, the Model 3 will come standard with full range of Tesla perks- including self driving technology and "bio-weapon defense mode".

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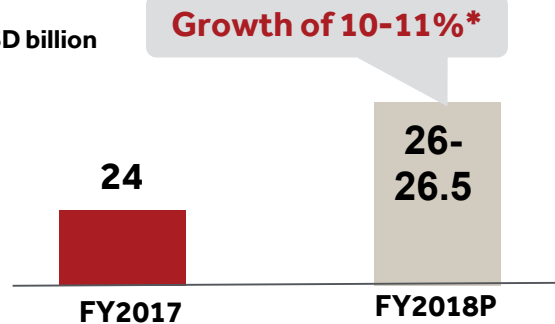
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Domestic Market: Opportunity

- **World's largest Opportunity:** Indian population at 1.2 Bn. India is the world's fastest growing smartphone market, with 462 million internet users, second only to China. Nearly 80 percent of India's internet users access the web with mobile devices opening up possibilities for new businesses.

- **Demographic dividend:** India with 356 million 10-24 year-olds has the largest concentration of youth population despite having a smaller population than China. This augurs well for the country as right education and healthcare can see the economy soar. Youth is the **driving force behind innovation**, creation, and the future leaders of a country. Youth also drives demand and consumption pattern in a country.

- **Global Innovation Hub:** India is home to many innovative and frugal solutions- top one being the Mangalyaan mission. India has over 600 local and 400 global ER&D centres, employing over 200,000 engineers. India can become the Global Innovation Hub.

- **3rd largest Startup destination in world:** India has become the world's third-largest startup ecosystem. As per NASSCOM estimates, India may have 11,500 startups by 2020, up from approx. 4800 startups in 2016. VC Funds and Angel funding networks have also been coming up in both the established and emerging hubs of the country.

Domestic Market: Actionable

- **Adoption of Technology should Increase:** As a nation, India needs a lot more adoption of technology which can help us transform into a digital economy. Government has launched various initiatives to bring public services online and create ecosystem through digital platforms. However there has to be more adoption from public to make these digital initiatives a success.

- **Technology Absorption and attract global investor community:** Indian industry needs to absorb the technology and learn to grow in the value chain. The investors should not perceive India as the next low cost manufacturing hub after China. They should not feel that what ever China is not interested in manufacturing considering it low value add job can be given to India. Procurement guideline should make Indian companies to learn the technology rather than just limiting themselves to low end and high volume jobs.

- **Increase investments in R&D:** In India, the aggregate domestic research and development (R&D) spending has never exceeded one per cent of GDP. Israel is the highest spender at 4.4%, followed by South Korea (3.7%), Japan (3.6%), the Scandinavian countries and the US (2.8%). In spite of attempts over two decades, India's vision of increasing R&D investment to 2% of GDP still has a long way to go from current .8%. India also fares very low in the ratio of researchers to the total population: It has 120 people employed in R&D per million of the population when compared to 633 for China.

Domestic Market: Actionable

- **Ease of Doing Business:** The ease of doing business is also a cause for concern. Though India has improved its rank in ease of doing business to 100 from 130 during last year, there is still a long way to go. Technology is helping increase the transparent and fast processing. Central government and as well as many states now have a single window clearance which is digital and make the overall process fast

- **Security & Self Reliance:** To leverage technology for manufacturing, India would need to become self reliant in terms of electronics manufacturing. The demand for electronics hardware in India is projected to increase to $400 billion by 2020, the estimated domestic production could rise to $104 billion only, creating a gap of $296 billion. Green Revolution of 1960s, boosted agricultural techniques, Operation Flood (also called White Revolution), of 1970 became the world's biggest dairy development program, now is the time when India would need self reliance in the areas of defence manufacturing, electronics, aerospace and so on.

- **Inclusion through innovation:** The technology innovations coming out of the labs can help connect the last mile to the government services. The bottom of the pyramid is able to get access to essential services like education, healthcare, banking, etc. which was not early possible few years back. There can be multiple streams of research that our publically funded labs focus on, however India has a number of challenges at social level which should take priority over others. It is good aspiration to be first on moon and mars, however it is equally important to make sure we have a reasonable financial inclusion, access to internet connectivity, and education of our citizens. The public labs should focus to innovate to solve such problems

- **Skill Development:** An industry study in India recently concluded that only 25% of fresh engineering graduates are employable by any technology company. At the same time, a NASSCOM study reckons that 40% of the 3.7 million strong IT workforce requires re-skilling over the next 5 years to keep pace with emerging technologies and automation.

Digital India-3 Core Components

E-governance: Governance and Services on Demand:

- Single window access to all persons by seamlessly integrating departments or jurisdictions
- Availability of government services in online and mobile platforms
- All citizen entitlements to be available on the Cloud to ensure easy access
- Government services to be digitally transformed for improving ease of doing business
- Making financial transactions above a threshold, electronic and cashless
- Leveraging GIS for decision support systems and development

Connectivity: Infrastructure as a utility to every citizen:

- High speed internet shall be made available in all gram panchayats
- Cradle to grave digital identity
- Mobile and Bank account would enable participation in digital and financial space at individual level
- Easy access to common service centre within their locality
- Shareable private space on a public cloud
- Safe and secure cyber space in the country

Empowerment: Digital empowerment of citizens:

- Universal digital literacy
- All digital resources universally accessible
- All government documents/certificates to be available on the Cloud
- Availability of digital resources/services in Indian languages
- Collaborative digital platforms for participative governance
- Portability of all entitlements for individuals through the cloud

The impact of Digital India till now

Ecommerce: The proliferation of mobile devices combined with internet access via affordable broadband solutions and mobile data is a key factor driving the tremendous growth in India's e-commerce sector. By 2020, the number of online shoppers are likely to cross 175 million, growing 3.5X over 2015. Technology will enable easy and efficient transactions. Even previously closed marketplaces are now opening up, encouraging smaller players to embrace e-commerce and list their products on their platforms thereby increasing product selection. Smaller players are likewise attracted by the incremental revenue potential arising from selling products via these online marketplaces which typically have a significantly large customer base.

E-Governance: According to government website electronic transaction aggregation and analysis layer (eTaal), 3.53 billion transactions took place in 2014, which almost doubled in 2015 to 6.95 billion. This also shows Indians drive for technology. so far more than 12,000 rural post office branches have been linked digitally and soon payment banking would also become a reality for them.

Also with a number of initiatives around governance and reforms undertaken by the government, India has jumped to rank 100 from 130, in Ease of doing business ranking published by World Bank. Initiatives like Aadhar and migration of government services to online should further help in improving the rank in coming year.

Infrastructure needs to be Supplemented by two more pillars

- **Content/ Applications/ Devices:**

Apart from digital infrastructure, Content creation, Applications and Devices are another big challenge which needs attention as we have limited content available in digital format and using the content outside of India might not be fully relevant to our requirement.

While localization into various language might increase the penetration, there is a question whether the science subjects like Physics can be fully translated into local language.

A number of Indian universities have launched their own MOOCs, often in collaboration with American universities. The government announced its own platform called Swayam.
India needs to leverage the existing platforms like Coursera, EdX, Udacity, Futurelearn, etc. and create content suitable for Indian students.

Digital Literacy:

In India, across over 6,50,000 villages and 2,50,000 panchayats represented by 3 million panchayat members. Approx 40% population is living below poverty line, illiteracy rate is more than 25-30% and digital literacy is almost no-existent among more than 90% of India's population.

National Digital Literacy Mission Programme is a dynamic and integrated platform of digital literacy awareness, education and capacity programmes that will help rural communities to take lead in the global digital economy and help them in maintaining the competitiveness and also shape a technologically empowered society.
The mission is headed by NASSCOM and targeted providing training to 5.25 million people by 2018 through 20 to 30-day programmes. Common services centers (CSCs) established as access points for the delivery of various electronic services to villages to provide access to e-services for rural citizens utilising the existing infrastructure.

Digital India impact on Key Sectors

Financial Inclusion: India's financial inclusion policy, Pradhan Mantri Jan-DhanYojana has shown qualitative results. The account-opening drive reached 221 million accounts, as on April 2016. The plan also envisages access to insurance, credit and pension facilities and channelling of all government benefits directly into the beneficiaries' bank accounts. In addition, the RBI has strengthened the Unified Payment Interface (UPI) in order to facilitate digital money transfers. In line with the digital strategy, the government has granted permission to a couple of payment banks, thereby kick-starting the initiative. Thus digital India and financial inclusion are closely connected.

Health: There is only one doctor per 1,700 citizens in India; the World Health Organization stipulates a minimum ratio of 1:1,000. From using tablets and iPads to access patients' records to using telemedicine to expand reach to rural communities, technology is making inroads into every aspect of healthcare and addressing major challenges. With concepts like ePharmacy, eDiagnostics, eInsurance, eReferrals, this program would provide a robust ecosystem support to the patients and service providers alike with access to information— anytime, anywhere. The database of health records is further expected to be linked to the Aadhar number of citizens.

Digital India impact on Key Sectors

Agriculture: Digital technology will be key to increasing agriculture productivity by delivering tailored recommendations to farmers based on crop, planting date, variety sown, real time localised observed weather and projected market prices.Remote sensing is another big data resource to support the development of derived weather products (radar), improved hydrology and watershed management, soil health, crop coverage and crop health estimates among other application. This is now complimented by Unmanned Aerial Vehicles (UAVs) that can capture multispectral images to assess crop health, damage and yield far more accurately than satellites.

Education & Skilling: India has also evolved in digital learning which we use in building capacity and creating new opportunities. Digital learning is already engaged in helping India build its capacity in world class content, pedagogical intervention and creating more jobs by creating new solutions for skill building at the basic level. Technology has the potential to create new models of learning and achieve impact at scale. We must invest in a strong technology backbone, focusing on hardware and software development across our school and higher education institutions. India has a very prospective market for the implementation of MOOCs. But the huge domain of students seeking education and higher studies is under-utilized in terms of implementing MOOCs.

Future of the Information Technology

- Global enterprise tech spend will rise to USD 4 trillion by 2025, 80 per cent of incremental tech spending will be digital. Enterprise spending on legacy areas is likely to decline by 15-25 per cent over the next 5 years. Indian technology services revenues projected to reach USD 350 billion by 2020, CAGR of 11%.

- Disruptive technologies are growing exponentially and creating many opportunities. Technologies can create more for less for many people around the world.

- Focus on adoption and absorption of technology in domestic market has to increase. This will help economic growth, more jobs and most importantly social equity.

THANK YOU