



The India Opportunity

17 – 20 April 2017, Greater Noida, India



India Services Sector

A Multi-trillion Dollar Opportunity for Global Symbiotic Growth

April 2017



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Message from Confederation of Indian Industry

Services sector contributes more than 60% to India's economy and 28% to the total employment. Attracting highest FDI inflows, services sector is on a growth trajectory driven by digital efforts of the government and highly skilled and low cost manpower.

We have witnessed good revenue generation with growing sectoral activities across tourism, healthcare, telecom, information technology, banking, finance, education and space. The new sectors, which have gained significant momentum from government and private players, include sports, railways and retail including e-commerce and hence, these are included as focus areas in the Global Exhibition on Services 2017. These sectors are increasingly gaining global visibility and attracting global players to invest and partner with domestic players.

Various government initiatives – Smart Cities, Clean India, Digital India, etc. are creating enabling environment giving further push to the services sectors such as communication, healthcare, environment, technology, energy, banking to name a few. With the right regulatory and policy framework and creating a climate that will ease the way of doing business in India, the services sector can achieve new height and hold an enlarged share of global services trade pie. These conscious efforts of the government to engage with global companies and governments have led to increased investments and participation in India's strategic initiatives. However, simplified regulations and standards, and the establishment of global rules on services such e-commerce, etc. to facilitate cross-border trade will be critical for future growth.

CII is proud to collaborate with Deloitte India to release a report on Services sector in India and we hope this would be useful for future businesses. We are happy to release this important report at the prominent event of Global Exhibition on Services 2017 organized jointly by the Ministry of Commerce and Industry, Government of India, Services Export and Promotion Council (SEPC) and Confederation of Industry (CII). The goal of GES is to provide a strong fillip to the global services sector becoming a forum for trade, knowledge exchange, and fresh partnerships between countries, governments, and businesses.



Chandrajit Banerjee
Director General,
Confederation of Industry



Message from Deloitte

In order to showcase India's potential in the services sector and the numerous opportunities it presents, the Ministry of Commerce and Industry in association with the Confederation of Indian Industry (CII) and SEPC have organised the third edition of the Global Exhibition on Services (GES), to be held in Greater Noida. This year, 70 countries are expected to attend this mega event, which is focussing on 20 sectors.

India has the fastest growing (9.2% in 2015-16) service sector in the world and contribute about 66% to Indian GDP. The services sector, which stands at about \$1.48 trillion, has a potential for exponential growth riding on various government initiatives like Make in India, Skill India, Start-up India and Digital India. Unique innovations of IndiaStack namely Aadhaar, DigiLocker, e-Sign, UPI, BHIM, and AEPS riding on JAM Trinity has created presence less, paperless, cashless and consent platform will enable exponential growth. India's distinctive competencies and competitive advantage formed by the knowledge-based services makes it unique emerging market in the world. Wide range of service sectors have seen double digit growth in the last few years backed by digital technologies and institutional mechanisms facilitated by the government. With significant progression in cultural and government outlook, the ease of doing business in India has substantially improved for both, domestic and international players. Today, India is home to some of the best companies of the world as a result of the continuing reforms in terms of reducing trade barriers, relaxing FDI restrictions and deregulation.

Deloitte India is honored to work with the Ministry of Commerce and Industry and CII for this grand event. We have prepared a publication highlighting and introducing the opportunities in various services sectors in India. This publication provides the industry profile of key services sectors, such as IT, telecom, media and entertainment, healthcare, banking & financial services, retail, railways, environment, energy, logistics, exhibition & event, facility, education, space, skills, start-ups and sports. The publication in particular highlights the focus of each sector on various government initiatives – Skill India, Digital India, Start-up India and Make in India. We have emphasized on the key drivers of growth in various services sectors in India and the potential for global expansion of services. The publication also focusses and delves into special areas such as cyber security, trade facilitation, and start-ups/ SMEs in services sectors. In addition to this, the publication also focusses on emerging opportunities in space technology, R&D, cyber security and the northeast region.

We hope the publication will enable various stakeholders such as the services industry, the public as well as the private sector to identify the future prospects for each of the service sectors covered in the publication and help in their strategic thinking and planning.

Executive Summary

Information Technology



Sector Overview

Global Industry

- The worldwide IT services market will reach \$938 billion in 2017
- The global IT spending is expected to reach \$3.5 trillion in 2017
- 26 billion internet connected devices and over 4 billion internet users by 2020
- In 2016, IP traffic 1.1 Zeta Bytes (over 1 trillion GB), by 2020 IP traffic is expected to touch 2.3 ZB

Indian Industry

- Indian IT-BPM sector size is \$143 billion and is expected to reach \$155 billion by 2017
- Exports market: \$108 billion in 2016
- Domestic market: \$52 billion
- GDP contribution: 9.5%

Key Events

- World Conference on Information Technology, China
- Consumer Electronic Show (CES), Las Vegas
- Mobile World Congress, Barcelona

Demand Drivers

- Digital transformation across industries
- Growing Internet penetration and smart devices (\$4.3 trillion connected life opportunity)
- Mainstream adoption of frontier technologies such as artificial intelligence, machine learning, robotics, automation, virtual reality
- The cost of key technologies such as 3D printing, DNA, solar power, sensors, drones, etc. is falling rapidly
- Rising demand of cost effective IT services in the emerging economies (Africa, ASEAN countries)

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">• Advisory services for the world in digital transformation• Asia Pacific Countries (Japan, China, Australia and ASEAN countries)• Emerging African countries• South America		<ul style="list-style-type: none">• Large pool of STEM talent• Cost advantage• Expertise in technology enabled business transformation• Vibrant start-up ecosystem
		Opportunities
		<ul style="list-style-type: none">• Digital transformation of industries across the world• Growing domestic market in India, due to digital economy initiatives
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none">• Engineering R&D services – major player in telecom & semiconductors• Leveraging domestic manufacturing industry for next gen services	Digital India <ul style="list-style-type: none">• Digital delivery of governance and citizen services• Technology infrastructure for digital economy• National e-Governance plan 2.0	<ul style="list-style-type: none">• To transform India into a knowledge empowered economy• Rising domestic demand• Digital India (\$1 trillion dollar opportunity)• India Stack: Technology for 1.2 billion (Aadhaar, UPI, e-KYC, eSign, DigiLocker)• Rising popularity of ICT enabled services• Tech savvy young demography• Upgradation of talent with new and emerging skills• Moving to full transparency in online procurement by Government e-market place• Programming of chatbots and robotic process automation along with applications of machine learning
Skill India <ul style="list-style-type: none">• Creating Skillful employment with online vocational courses. Making young students employable and providing working population with new skills	Start-up India <ul style="list-style-type: none">• Fueling the technology startups in India• Providing a platform to technology savvy entrepreneur culture in India	
Case Study		
<ul style="list-style-type: none">• Smart India Hackathon 2017: World’s largest hackathon involving over 3 million technology students, 6400+ technology institutions in India, 36 hours nonstop digital product development competition over 25 centers across the nation solving 600 problem statements by 25 ministries.• Digital India• India Stack: Technology for 1.2 billion for paperless, presenceless, cashless and consent• World class digital payment infrastructure through JAM (Jan dhan, Aadhaar, Mobile), IMPS, UPI, AEPS• Unparalleled innovation for creating digital identity for 1.3 billion Indians using two biometrics (retina scan, fingerprint)		

For details, see page 63

Healthcare



Sector Overview

Global Industry

- The global healthcare market had a turnover of \$7 trillion in 2015

Indian Industry

- In 2016, the Indian healthcare market had a turnover of \$110 billion and is expected to touch \$280 billion by 2020. Healthcare delivery constitutes 65% of the overall Indian healthcare market.
- FDI in hospital and diagnostic centers: \$4 billion (April 2000 and September 2016)
- Medical tourism in India
 - Current: \$3.9 billion (2016)
 - Projected: \$8 billion (2020)
 - Tourist arrivals: ~230,000 (2016)

Key Events

- World Congress on Healthcare and Medical Tourism, Dubai UAE

Demand Drivers

- Large ageing population
- Increasing healthcare costs in the western world
- Increase in chronic and communicable diseases
- Increase in disposable income aiding affordability of healthcare services

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">Currently patients from East Africa, Middle East, neighboring countries come to IndiaIndia's cost advantage will significantly open doors for the developed countries including US, Europe, South East Asia, Japan, Middle East, Africa		<ul style="list-style-type: none">Presence of world-class hospitals and skilled medical professionalsTreatment for major surgeries in India costs approximately 10% of the cost in most of the developed countries
		Opportunities
		<ul style="list-style-type: none">Increasing penetration of health insuranceUse of technology for healthcare delivery in remote corners
Linkages		Growth Enablers
Make in India Promoting manufacturing of medical equipment, devices, consumables and drugs in India. Reduce the cost of these devices, which were so far imported (with the associated import duties)	Digital India Fueling innovative work in space of m-health, telemedicine, electronic medical records, e-ICU, diagnostics through health apps, etc.	<ul style="list-style-type: none">National Health Policy 2017<ul style="list-style-type: none">Comprehensive primary healthcare packageHealth Card for access to primary healthcare facility services anytime , anywhereFree drugs and diagnosticsFree healthcare to victims of gender violenceDigital Intervention – tele consultation, National Knowledge Network, National Digital Health Authority and introduction of electronic health recordsAYUSH Ministry is working with various agencies, institutions, Ayurveda researchers and practitioners across the globe to turn India into a global hub for knowledge, research, practice and developmental projects on traditional medicines
Skill India Healthcare Sector Skill Council (HSSC) has been set up to aid skilling and vocational training for healthcare industry	Start-up India Start-ups are rapidly increasing in number, covering aspects like diagnostics, aggregation of health providers, electronic medical records, video/remote consultations second opinion consultations, etc.	
Case Study		
<ul style="list-style-type: none">A leading eye care hospital in India provides cataract surgery for \$16 including 2 night stay at hospital, and medication and cost of lens. Only 30% of their patients pay for treatment and rest go free of charge and yet the hospital makes 35% operating profit.Indian Scientist developed credit card sized ECG machine costing INR 4000 compared to imported machines which are heavier, bigger and 10 times more expensive.Healthcare innovation by an Indian: A origami-based, use and throw microscope costing 50 cents for on-field diagnosis of diseases like malaria, in remote areas of the world like Africa, Thailand.A knee replacement surgery could cost \$40,000 in the US, \$10,000 in Thailand, and \$8500 in India. Similarly, for bone marrow transplant costs \$400,000 in the US, \$150,000 in the UK, and \$30,000 in India.Pradhan Mantri Suraksha Bima Yojana at a cost of INR 12 per annum with a coverage of INR 2,00,000		

Skills



Sector Overview

India Industry

- To benefit economically from the demographic dividend, Planning Commission has identified 20 sectors to prepare students for employment. The sectors are: Construction, Chemicals, M&E, Electronics, Furniture, Tourism, BFSI, Gems & Jewellery, Leather, IT and ITeS, Education and Skills, Food Processing, Healthcare, Retail, Transportation, Textiles, Automobile, Real Estate.
- In 2020, the average Indian will be only 29 years old, compared to 37 in China and the US, 45 in Western Europe and 48 in Japan.
- Over 9.2 million people trained in NSDC, and 3.6 million placed in a short span
- Vocational training introduced in 10 States, covering 2400+ schools, 2 Boards, benefitting over 250,000 students.
- Net enrolment in vocational courses in India is about 5.5 million; US: 11.3 million; China: 90 million

Demand Drivers

- Top countries in the world including Japan, India, Australia, Germany, US, China etc. are facing great skill shortage, creating demand for skilling programs
- Alleviation of poverty as more than one billion people in the world live on less than \$1 a day. In total, 2.7 billion struggle to survive on less than \$2 a day¹.
- Youth make up 25% of the global working-age population; yet their share in total unemployment is 40%. Young people are almost three times more likely to be unemployed as adults.
- Government initiatives
- Online channel gaining momentum
- Corporate partnerships
- Private participation
- Digital trends

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> According to OECD, all countries which are likely to face shortage of skills including Japan, Australia, Germany, US, China, UK, etc. Other geographies including Africa, Nepal, Sri Lanka, Myanmar, Bangladesh and other Middle East countries 		<ul style="list-style-type: none"> Low cost skill development capabilities English proficiency in Indian skill development sector can attract global students National Skill Development Corporation offers free and paid skill development courses to Indian students and gives skill certifications Intermediate skill development programs like ITIs, Diploma programs in PPP mode
		Opportunities
		<ul style="list-style-type: none"> Focus on imparting skills through online and onsite medium. Business models like National Skill Development to provide affordable skill development courses to global students Revenue sharing franchisee model
Linkages		Growth Enablers
Skill India Aim to skill 402 million workers by 2022 through Pradhan Mantri Kaushal Vikas Yojana, National Skill Development Mission, and loans up to INR 150,000	Digital India Aim to provide training to the youth in the skills required for availing employment opportunities in the IT/ITES sector.	<ul style="list-style-type: none"> Skill India Initiative was launched by the Prime Minister in 2015 to train 400 million people by 2022. Government of India has launched Skill Acquisition and Knowledge Awareness for Livelihood Promotion Programme (SANKALP) to provide vocational training to 35 million youth. Government has launched next phase of Skill Strengthening for Industrial Value Enhancement (STRIVE), to focus on improving the quality and market relevance of vocational training provided in ITIs and strengthen the apprenticeship programmes through industry-cluster approach.
Case Study		
<ol style="list-style-type: none"> National Skill Development Corporation: The objective of NSDL is to contribute significantly (40%) to the overall target of skilling / up-skilling 400 million people in India by 2022, mainly by fostering private sector initiatives in skill development programmes and to provide funding. NSDC has 290 training partners, 4526 training centers and has created a world-class scalable platform using digital technologies². deAsra: deAsra's vision is to support entrepreneurship through a scalable business modelling strategy. deAsra's target is to generate 1,00,000 jobs in the next five years, (2015 to 2020) by facilitating the creation of 25000 enterprises³. 		

For details, see page 49

Education



Sector Overview

Global Industry

- The global education market, in terms of revenue, stood at \$4.4 trillion in 2013.

Indian Industry

- The Indian education market, in terms of revenue, stood at \$97.8 billion in 2016.
- FDI in education sector in India: \$1.4 billion (April 2000-Dec 2016)
- One of the world's largest higher education systems with enrollments of ~33.3 million students in colleges, institutions, across 50,000+ higher education institutes and 750+ universities.

Key Events

- The Global Education Conference - A week-long virtual conference using Blackboard Collaborate platform involving 25000+ students, educators, and organizations at all levels from 180+ countries

Demand Drivers

- ICT and technological developments – Telecom driving geographical and financial inclusion
- Demand for skilled resources
- Increasing affluence in society
- Participation of female labor force and demand for pre-school facilities
- Demand for vocational education
- Growing significance of MOOCs

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> • Opportunity to provide world class cost effective education to people who cannot afford the high cost of education in the developed world. • Support developing world both through online and onsite education. <ul style="list-style-type: none"> – South Asia (Nepal, Afghanistan, and Bhutan) – Middle East – Africa (Nigeria and Sudan) 		<ul style="list-style-type: none"> • Low cost education • Low cost of living attractive for International students • World-renowned educational institutions, including IITs, IIMs, IISc, and AIIMS • Government's push towards higher education • India and China do better in global rankings and have greater opportunities for international collaboration
		Opportunities
		<ul style="list-style-type: none"> • Technological advancements driving innovation in teaching methodologies. • Tutoring in the schooling segment is expected to grow from \$8 billion in 2011 to \$26 billion in 2020. Similarly, pre-school segment is at nascent stage, and growing. • In the next 35-40 years, about 700 million to 1.3 billion youth could potentially go through India's higher education system.
Linkages		Growth Enablers
Start-up India Many start-ups are entering to support education programmes in remote rural locations. About 591 education technology startups were present in 2015 with a funding of about \$135 million.	Digital India <ul style="list-style-type: none"> • All schools to be connected with broadband and Wi-Fi • Pilot MOOCs (Massive Online Open Courses) launched through SWAYAM portal which has 93 under graduates and 83 graduate programs 	<ul style="list-style-type: none"> • Government of India allows 100% FDI in the primary education sector under the automatic route. The government has also permitted 100% FDI in construction projects, related to educational institutions. • Alignment of academic year, course-curriculum and credit system with the leading educational hubs including the US. • Government's target to increase digital literacy to at least 50% in the next three years from the current 15%. • Rules and policies by UGC to facilitate the creation of world-class institutes in India which can admit up to 30% foreign students. • National Education Policy (NEP) 2016 proposed the introduction of a new system of measuring annual learning outcomes in schools, wherein emphasis will be given on science education to promote creativity through innovative content. • The FY2017-18 budgetary allocation stood at \$11.9 billion.
Case Study		
<ul style="list-style-type: none"> • MHRD has launched Study Webs of Active Learning for Young Aspiring Minds (SWAYAM), a web portal where Massive Open On-line Courses (MOOCs) are offered. It provides affordable and flexible way to learn new skills, pursue lifelong interests and deliver quality educational experience at scale. • A learning app, launched in 2015 for students, with focus on K-12 classes, and competitive exams (CBSE, CAT, IAS, GMAT, GRE, JEE, NEET, and Bank Exam). It caters to 200,000 school and college students, and attracts 30,000 new users every month. 		

For details, see page 52

Banking & Financial Services



Sector Overview

Global Industry

- The global banking industry is expected to be \$163 trillion in 2017.

Indian Industry

- The Indian Banking and Insurance sector accounted for ~5.8% of GDP (at factor cost, current price) in FY 13⁴. Indian GDP in 2015 stood at a whopping \$2.095 trillion⁵, valuing the industry's contribution in GDP at > \$121 billion in 2015. Based on MOSPI's advanced first estimates of National Income for FY 17, the share of the Financial and insurance sector* in GVA stood at INR 7,106.13 billion in FY17.

Key Events

- World Economic Forum Annual Meeting
- The Future of Banking (The Economist)
- FT banking summit

Demand Drivers

- Penetration of financial services has significant growth potential
- Growing income levels
- Evolving consumer behavior

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">• Advisory for creating digital identity digital payments through UPI, IMPS, AEPS, BHIM – eSign.• Inward Investments - Mauritius, Singapore, US, UK, Netherlands• Outward Investments - Emerging economies in Asia, Africa		<ul style="list-style-type: none">• Government focus on digital• Large customer base• High mobile penetration• Increasing last-mile connect via technology - lowering cost for customer• Preferred destination of cost, strategic & talent arbitrage
		Opportunities
		<ul style="list-style-type: none">• Refinancing capital: Real estate, infra and bad loans• Innovation capital: Fintech, RPA, cognitive, blockchain• Investment capital: New banks• Re-engineering capital: GIC/shared services
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none">• Easy loans and benefits to SMEs• Push for usage of local resources for currency printing• Focus on infrastructure financing	Digital India <ul style="list-style-type: none">• New Bank Licenses• Digital infrastructure (JAM Trinity) – UPI, USSD, IMPS, BHIM app, QR code• Demonetization• Central KYC	<ul style="list-style-type: none">• Digital India vision to transform India into a digitally empowered society and knowledge economy. Digital payment being key driver of this.• Strong government and regulator push – GOI has raised FDI cap in Insurance and pension from 26% to 49% and in ARC to 100%; RBI is considering allowing 100% FDI in private sector banks; New Banking licenses; Universal banking license available on tap; Demonetization; NPA management; Aadhaar; and other digital initiatives:<ul style="list-style-type: none">– Paperless (Digilocker)– Presence less (Finger Prints, Retina Scans)– Cashless (Aadhaar Enabled Payments Systems - AEPS)– Consent Layer (E-Signatures)• Increased competition• Strategic arbitrage of GICs• Foreign banks allowed to operate via WOS
Skill India <ul style="list-style-type: none">• Talent arbitrage for global support• Technology learning institutions	Start-up India <ul style="list-style-type: none">• Fintech opportunity• Agile and digital focussed -Challenging traditional models	
Case Study		
<ul style="list-style-type: none">• IndiaStack: Technology for 1.2 billion with paperless, cashless, presence less and consent.• A leading Indian wallet provider started operations in Canada via initial partnerships with 1,000 merchants. The app allows Canadians to pay bills (mobile, electricity, water, internet, cable, etc.), insurance and property tax and is available on Android and iOS platforms in the market.		

Note: *Financial and Insurance sector is valued at 29% of the Financial, Insurance, real estate and professional services as per press note on First Advanced estimates of National Income, MOSPI, 2016-17.

For details, see page 56

Start-ups / SME in Services



Sector Overview: SMEs and Startup Services

Global Industry

- US and UK are the major startup ecosystems
- US: 52,000 startups, UK: 4,900
- Israel and China: Growing ecosystem

Indian Industry

- 3rd largest start-up ecosystem in the world; 10,000+ start-ups by 2020; 4750 tech-based start-ups
- \$4 billion funding in 2016; 46.5% CAGR (2010-2016)
- Average age of start-up founders: 28 years
- Around 800 investors in the market
- MSME sector contributes 38% to the GDP; MSME services sector: 30% of the GDP

Key Events

- Global Startup Weekend

Demand Drivers

- Growing interest of global investors and silicon valley entrepreneurs
- Easy exit route for Indian start-ups due to rising M&A activity, offering opportunity for global players
- Increasing demand for cost effective and high quality services globally
- Growing investments in R&D and Engineering in India

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">Major market: DomesticAnalytics and Technology startups export services to US , UK, Mid East and ASEAN Countries		<ul style="list-style-type: none">Strong IT/ITeS presenceHigh adoption of Internet ServicesTech savvy and entrepreneur driven demographicsHuge mobile PenetrationLarge investmentsStrong presence of Angel Investors and incubators
		Opportunities
		<ul style="list-style-type: none">Skilled manpowerEvolving consumer demandJAM trinity – means to address large scale opportunities in rural marketsDemand for online service
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none">Platform for new product and engineering companies	Digital India <ul style="list-style-type: none">NOFN, Cloud, Pradhan Mantri Jan-Dhan Yojana, Aadhaar, Mobile (JAM) provides a great platform for start-upsBoost to Fintech, HealthCare, Education, Ecommerce	<ul style="list-style-type: none">Start-up India initiative by Government of IndiaDigital India initiativeCommoditization of consumer technologySmartphone and internet penetrationAvailability of risk capitalGlobal venture capital's interest in Indian start-ups
Skill India <ul style="list-style-type: none">Entrepreneur driven skillsPartnership from institutes like IIMs and IITs	Start-up India <ul style="list-style-type: none">Liberal policies to encourage businessStart-up centers, incubators and policy support	
Case Study: Start-up India program		
Start-up India program provides a platform for new technology players for self-certification, patent application, tax benefits, funding up to INR 100 billion through alternate investment funds, and INR 20 billion through credit, etc.		

For details, see page 73

Media & Entertainment



Sector Overview

Global Industry

- Global Media & Entertainment (M&E) industry is expected to touch a market size of \$2.14 trillion by 2020

Indian Industry

- India M&E industry market size estimated to be \$20.5 billion in 2016
- Television, print and films are 3 largest sectors
- Indian film industry: Largest in the world in terms of number of films produced in more than 20 languages, 2nd highest footfall in the world
- 2nd largest television market with 181 million television households in 2016; ~892 television channels in India
- Largest newspaper market with 110,851 registered publications (March 2016)
- FDI inflows: \$6.3 billion (April 2000-Dec 2016)

Key Events

- NAB Show, Las Vegas, Nevada
- Broadcast Asia, Singapore
- Cannes Film Festival, France
- Emmy Awards, USA
- The Oscars (Academy Awards), California, USA

Demand Drivers

- Evolving lifestyles and affluence
- Upcoming use of visual effects (VFX) in movies
- Deployment of emerging technologies such as virtual reality, augmented reality, drone shootings, etc.
- Demand for over-the-top (OTT) services that offer advertising, free content

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">• Captive NRIs across the world• Increasing interest from US, UK, China, Middle East, Africa and South East Asia in India cinema• Online platforms and dubbing in local language• Shooting in India at historical monuments and scenic places		<ul style="list-style-type: none">• Liberalization of FDI policy (e.g. in broadcast sector)• Government initiatives to promote India as a filming destination• Talented crews to assist in filmmaking at comparatively low cost• Growing internet penetration due to proliferation of broadband through public Wi-Fi networks
		Opportunities
		<ul style="list-style-type: none">• Digital adoption across value chain• Co-production treaties• Increasing penetration of multiplexes• Growth potential in animation, VFX, gaming sectors• Edutainment channels that provide educational content to young minds• Investments from major film studios in regional cinema• Distribution of channels by Indian broadcasters in overseas countries
Linkages		Growth Enablers
Make in India FFO offers a single window mechanism for facilitating shooting to promote foreign films shooting in India	Digital India Digital India campaign to strengthen the sectors such as video streaming, online music consumption and gaming by increasing internet penetration	<ul style="list-style-type: none">• Ministry of Information and Broadcasting has set up the Film Facilitation Office (FFO) to facilitate efficient approvals and improving ease of shooting in India• Setting up of 'Centres of Excellence' with state-of-the-art facilities by state governments to promote gaming, animation, media & entertainment sector• Increase of FDI limit to 49% in television news channels and FM radio and 100% FDI allowed in digital cable, DTH services
Skill India Government initiatives focusing on generation of adequately skilled workforce which is industry-ready and employable	Start-up India Tax exemption to encourage animation and gaming start-up companies	
Case Study		
"India as an international filming destination": After the success of India-based movies such as Slumdog Millionaire, many international studios are increasingly considering shooting large portions of their films in India. Life of Pi, The Second Best Exotic Marigold Hotel, Million Dollar Arm, and Mission Impossible IV were some of the movies recently shot in India		

For details, see page 78

Sports Services



Sector Overview

Global Industry

- Global sports market: \$480-620 billion (2015)

Indian Industry

- Indian sports sponsorship market grew 19.3% to \$0.95 billion (INR 64 billion) in 2016
- 1.33 million youngsters are likely to take up sports professionally by 2017
- Of total sponsorships, media spends accounted for 54.8% share followed by on-ground advertising/sponsorship (18.2%), team sponsorships (10.9%), franchise fees (8.5%), and endorsements (7.4%)
- Cricket continues to account for highest sports sponsorships

Key Events

- Olympic Games
- Tennis Grand Slam
- Federation Internationale de Football Association (FIFA) World Cup
- Formula 1 Races

Demand Drivers

- Favorable demographic profile
- Increase in female viewership worldwide
- Demand for data analytics services for enhancing performance of players
- Growing online viewership of sports fueled by mobile and internet connection

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">Australia, France, Hungary, Kazakhstan, Kuwait, Maldives, Mauritius, Netherland, New Zealand, Seychelles, Turkey and Turkmenistan (MOUs in sports with India)South Asia Association for Regional Cooperation (SAARC) nations		<ul style="list-style-type: none">Increase in the number of academies and training centers by Indian corporates and renowned sportspersonsUnexplored rural market and demographic profile in India
		Opportunities
		<ul style="list-style-type: none">NITI Aayog has advised the government to bid for and host 100 major international sports events till 2026 by creating a separate arm under the Sports Authority of IndiaDemand for sports infrastructure, favorable government policiesSports tourism and sports medicine have high potential
Linkages		Growth Enablers
Make in India Develop sports infrastructure in both rural and urban areas	Digital India To strengthen the sectors such as video streaming, online sports content consumption by increasing internet penetration	<ul style="list-style-type: none">Inclusion of sports in the harmonized master list of infrastructure sub-sectors by Union Finance MinistryMinistry of Youth Affairs and Sports (MYAS) gained the approval of Ministry of Corporate Affairs (MCA) for inclusion of sports infrastructure, construction and maintenance as part of CSR activitiesGovernment initiatives like Khelo India and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) to promote sports
Skill India GOI-initiated Rashtriya Yuva Sashaktikaran Karyakram (RYSK) — New umbrella scheme to enable youth to realise their potential		
Case Study		
<ul style="list-style-type: none">War of leagues: With IPL & ISL, is India emerging as a sporting nation? Inspired by the success of IPL, India witnessed the emergence of new non-cricket sports leagues – Indian Super League (ISL), Hockey India League, Pro Kabaddi League (PKL) and Indian Premiere Tennis League. This has helped in improving skills of Indian players, infrastructure and developing sporting venuesEmergence of virtual reality based sports experiencesSetting up of sports convention centers for training and conducting events		

For details, see page 83

Telecom



Sector Overview

Global Industry

- The global telecom services market size, in terms of revenue was \$1.13 trillion in 2016.

Indian Industry

- Mobile services market is expected to reach \$37 billion in 2017 and \$103.9 billion by 2020 at a CAGR of 10.3%.
- 2nd largest telecom market in terms of subscriber base (1.05 billion subscribers)
- 4th largest app economy

Key Events

- Mobile World Congress, Barcelona
- Wireless Infrastructure Show, Florida

Demand Drivers

- Rising popularity of Indian telecom consultancy services in Africa and South America
- Indian telecom companies setting up global footprint
- Global presence of telecom infrastructure providers
- Rising FDI and entry of global players in Indian MVNO business
- Leading ICT service providers supporting Digital India and investing in public Wi-Fi and smart cities

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">Emerging African countriesSouth AmericaASEAN nationsNeighboring nations i.e. Bangladesh, Sri-LankaUK and US as inward investment for Digital India		<ul style="list-style-type: none">High adoption of mobile devicesLowest tariffs in the worldLarge skilled workforceStrong optical fiber backhaul to connect every citizen in the country
		Opportunities
		<ul style="list-style-type: none">Internet economy expected to touch INR 10 trillion (\$146.72 billion) by 2018, contributing 5% to the GDPUntapped potential in rural areasDemand of data services, digitizationPopularity of non-traditional services
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none">38 new mobile manufacturing units established since September 2015New platform for Telecom equipment manufacturers	Digital India <ul style="list-style-type: none">Digital paymentsBharatNeteKrantiData analytics for social change	<ul style="list-style-type: none">Rising demand for internet services in the under penetrated rural marketPopularity of non-traditional telecom services (i.e. OTT, digital content, digital banking, e-health, social networks, e-commerce)Cashless economy and other reforms in the payment sector of IndiaPay-tv business modelsPersonalized experience
Skill India <p>Online and offsite platform for vocational skill development, certification and employability.</p> <p>249 training partners and 3,222 training centers</p>	Start-up India <p>Policy framework to encourage more tech start-ups to establish business in India and provides an attractive platform for foreign investment</p>	
Case Study: Reverse Innovation Success in the Telecom Sector		
<ul style="list-style-type: none">One of the leading telecom operators in India adopted “Minute Factory” model and chose to strategically outsource its core functions which resulted in a paradigm shift in the Indian telecom services market. The outsourcing of core activities allowed the operator to be more customer centric, improved profitability and provided the space to innovate in terms of service offering by adding value added services. The success was then replicated in African operations and other parts of the world.Active and passive infrastructure sharing such as towers, etc. for optimizing capex and opex.		

For details, see page 88

Logistics



Sector Overview

Global Industry

- Global logistics industry: \$3.34 trillion in 2016

Indian Industry

- India spends around 14.4% of its GDP on logistics and transportation sector
- Indian logistics sector is expected to grow from \$115 billion to \$360 billion by 2032.

Key Events

- Hamburg International Conference of Logistics, Hamburg, Germany

Demand Drivers

- Growing demand in rural and semi-urban areas
- Increased focus on third-party (3PL), 4PL and 5PL logistics
- Implementation of Goods and Service Tax (GST) to improve efficiencies
- Development of dedicated freight corridors, logistics parks, free trade warehousing (FTWZ), multimodal logistics parks (MMLP) and multi-modal transport services

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">Latin America (Brazil, Mexico and Argentina), Africa (Nigeria), Asia (Indonesia, China, Hong Kong and Singapore)		<ul style="list-style-type: none">Strong demand from end-user industriesDevelopment of new IT-enabled systemsGovernment focus on expansion of road, rail, port and airport infrastructure in India
		Opportunities
		<ul style="list-style-type: none">Increasing focus on third party (3PL), 4PL and 5PL logisticsIncrease in e-commerce in IndiaFocus on specialised services such as liquid logistics, temperature-controlled logistics or cold chain logistics
Linkages		Growth Enablers
Make in India Growth of manufacturing sector in India will drive logistics infrastructure; manufacturing sector spends nearly 2.2% of its revenue on logistics	Digital India Logistics companies are focusing on increased asset utilization and improvement in customer satisfaction level by deploying smart IT solutions in the sector	<ul style="list-style-type: none">Taxation and regulatory structure for making the sector competitiveInvestments in infrastructure for higher efficienciesDevelopment of multi-modal hubs including road, railway, ports, aviation and inland waterwaysLogistics costs in India is 16-18% compared to China which is 8-10%, and Europe which is 10-12% - scope for significant reduction in costIncrease in national highway to 200,000 km will lead to 80% of country's traffic moving fasterInvestment of over \$250 billion in the road sector by 2019 (of which \$80 billion has been invested)Promotion of inland waterways and construction of 2000 water ports and linkages with railways and highways
Skill India CII and National Skill Development Corporation have set up a Logistics Sector Skill Council to meet the increased demand for skills in this sector		
Case Study		
<ul style="list-style-type: none">The government of India has laid strong emphasis on developing India as a regional maritime hub and formulated the Sagarmala Program focusing on development along 4 thematic areas viz. port modernization and new port development, port connectivity, port led industrialization and coastal community development.Innovative models in construction and financing through PPP models by NHAI		

For details, see page 93

Retail & E-commerce



Sector Overview

Global Industry

- The aggregate revenue of the top 250 global retail players was \$4.31 trillion in 2015.
- The turnover of e-Commerce market was \$1.4 trillion in 2016.

Indian Industry

- Retail market is expected to reach \$1 trillion by 2020 from \$600 billion in 2015
- E-commerce sales to reach \$120 billion (2020) from \$30 billion (2016)
- Retail and e-commerce contribute ~10% to GDP and 8% in the employment
- FDI inflows in retail were INR30.2 billion in India (Jan-2016 to Sep-2016)

Sector leading countries

- China, United States, United Kingdom, Japan and Germany are the leading countries in the sector.

Demand Drivers

- Retail market demand is driven by income growth, urbanization and attitudinal shifts of the consumers.
- E-commerce market is driven by robust investment in the sector and rapid increase in the number of internet and smartphone users

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">• FDI investments in multi-brand products by global companies		<ul style="list-style-type: none">• Strong distribution and delivery network• Constant marketing innovation• Omni-channel retailing
		Opportunities
		<ul style="list-style-type: none">• Changing demographics and increasing per capita income• Government initiatives• Use of technology and digitization
Linkages		Growth Enablers
Make in India Manufacturing hub <ul style="list-style-type: none">• Initiatives to promote local production – government policies and incentives.	Digital India A trillion dollar opportunity <ul style="list-style-type: none">• Digital drive, cashless economy leading to higher adoption of online retail.• A platform for more online services in the country.	<ul style="list-style-type: none">• Implementation of GST is expected to enable easier movement of goods across the country, thereby improving retail operations for pan-India retailers.• With the allowance of 100% FDI in single brand retail, investor sentiment will get further push.• Increasing smartphone penetration along with high speed networks.• Increase in income levels• Improvements in logistics and supply chain• Proliferation of digital payment ecosystem
Skill India <ul style="list-style-type: none">• Human capital plays a very important role in retail and e-commerce sectors.• The influence of the young generation is a key driver to success.	Start-up India <ul style="list-style-type: none">• Catalyst for growth among the start-up enterprises.	
Case Study		
<ul style="list-style-type: none">• The government has launched E-Marketplace GeM to bring greater transparency and efficiency in public procurement. It will also help in minimizing prices, and enhance the processes in ways such as demand aggregation, real-time price discovery and prompt automated payments.• Agrimarket App developed by the government to keep farmers updated with the crop prices.• Increasing the rural e-commerce footprint through over 140,000 post offices of India Post in the rural India providing the last mile reach.		

For details, see page 101

Environmental Services



Sector Overview

Global Industry

- \$600 billion global market in 2016

Indian Industry

- 3rd largest environmental technologies market globally
- The Indian environmental technology market, including goods and services, was worth \$16.3 billion in 2016
- 5th largest e-waste producer in the world
- 1.8 million tons of e-waste generated every year, which is expected to rise to 5.2 million tons by 2030
- 62 million tons of solid waste generated every year
- 164,000 MT of waste converted to compost in 2016
- 88.4 MW energy produced from waste in 2016

Key Events

- Environmental Pollution and Sustainable Energy Conference, Melbourne, Australia
- 5th World Convention on Recycling and Waste Management, Singapore City

Demand Drivers

- Rapid globalisation
- Population growth and growing middle class
- Increased international trade

Potential for Global Expansion		Strengths
<ul style="list-style-type: none">• South-East Asia, Africa		<ul style="list-style-type: none">• Increased acceptance of PPP structures• Upsurge in technology adoption for better waste management• A number of angel investors backing waste management startups in India
		Opportunities
		<ul style="list-style-type: none">• Government supporting waste management through Swachh Bharat Mission, Smart Cities Mission, and AMRUT• Municipal solid waste generation expected to reach 114 million by 2041• Government offering subsidies for converting waste to energy (WtE)
Linkages		Growth Enablers
Make in India Foreign players (through PPP model or in collaboration with Indian players) can manufacture equipment related to waste management	Smart cities Smart cities to have hi-tech solid waste management system	<ul style="list-style-type: none">• The government allows 100% FDI under the automatic route for urban infrastructure areas including waste management subject to relevant rules and regulations• Target to construct 6.6 million toilets in urban India, and over 100 million toilets in rural India by 2019• Swachh Bharat Cess (SBC) levied at a rate of 0.5% on the value of taxable services• Investment in Swachh Bharat mission components such as public and household toilets, solid waste management, capacity building etc.
Start-up India Start-ups are showing enthusiasm in the field of recycling and WtE	Digital India Swachh Bharat App which captures images using location-based data and analytics at the back-end to pin-point responsibilities and actions	
Case Study		
<ul style="list-style-type: none">• Indian Government has launched the Swachh Paryatan App which lists 25 monuments protected and maintained by Archaeological Survey of India. These 25 monuments have been identified as Adarsh Smarakas. Citizens can share images of garbage at these sites and the government will take immediate action.• ISRO brings together world's biggest collation of space agencies to fight pollution and global warming.		

For details, see page 104

Energy Services



Sector Overview

Global Industry

- Global primary energy consumption increased by 1.0% in 2015, well below its 10-year average of 1.9%. Oil remains the world's leading fuel, accounting for 32.9% of global energy consumption

Indian Industry

- 3rd largest energy consumer in the world. It imports over 81% of its crude oil requirements, and meets 45.7% of its gas requirements through imports
- 5th largest solar energy producer
- 4th largest wind energy producer with over 32000 MW installation
- 11th largest in the total renewable energy producer in the world

Key Events

- 22nd World Petroleum Congress, Istanbul, Turkey

Demand Drivers

- Government aims to reduce oil import dependency to 10% from current level by 2022
- Oil and gas companies plan significant investments to increase oil and gas output
- India to increase the share of natural gas in its energy mix from 6.5% to 15% by 2020-21 by more than doubling its LNG import capacity to 50 MT in the next few years
- India has made a huge commitment as a part of COP-21 to reduce energy intensity in the economy by 33-35%, compared to 2005 level, by 2035
- Government accorded CGD network the status of public utility to increase its reach

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> Russia, Iran, Qatar, UAE, Nepal, Bangladesh, US, Australia 		<ul style="list-style-type: none"> Government initiatives such as HELP, UDAY schemes in oil and gas and power sector India to merge its existing state-owned oil companies to set up a global integrated oil and gas company
		Opportunities
		<ul style="list-style-type: none"> Government to allow oil and gas companies to select areas where they want to drill through Open Acreage Licensing Policy (OALP) India has targeted generating 175 GW of power from renewables by 2022
Linkages		Growth Enablers
Make in India Oil PSUs have formulated INDEG (Indigenisation Group) to increase the domestic component in all kinds of oil procurements		<ul style="list-style-type: none"> New Hydrocarbon Exploration and Licensing Policy (HELP) to provide for a uniform licensing system for oil, gas, CBM etc., under a single licensing framework The Discovered Small Fields Policy offers 67 Discovered Small Fields in 46 contract areas through new revenue sharing model The Ethanol Blended Petrol (EBP) Programme will enable oil companies to sell ethanol blended petrol with ethanol percentage of up to 10%
Skill India <ul style="list-style-type: none"> Government focus on generation of adequately skilled workforce. One of such initiatives by MoPNG is to set up 6 Skill Development Institutes (SDIs) in the country 	Start-up India Oil India and ONGC have announced INR 500 million and INR 1 billion start-up funds, respectively to foster and incubate new ideas related to oil and gas sector	<ul style="list-style-type: none"> India and France launched a \$1 trillion programme to help member countries of the International Solar Alliance (ISA) harness their solar resources
Case Study		
<ul style="list-style-type: none"> In February 2017, India's solar power sector recorded low-winning bids of INR 2.97 per kilowatt-hour (kWh) to build a 750 MW plant at Rewa in Madhya Pradesh, called by Rewa Ultra Mega Power Ltd, a JV of Solar Energy Corp. of India Ltd (SECI) and MPUVNL. The low tariff — primarily due to low cost of financing the project — has made solar energy a competitive source of energy vis-à-vis the coal-fueled conventional source of electricity. The Kamulthi Solar plant, largest solar power plant located in India with a capacity of 646 MW (cumulative over 10,000 MW through solar) and cleaned by robotic systems that is charged by solar panels. 		

For details, see page 109

Space



Sector Overview

Global Industry

- In 2015, the global space industry had a turnover of \$335 billion, of which the satellite industry accounted for 62% (\$208 billion)

Indian Industry

- Indian satellite industry includes satellite services, satellite launch services, satellite manufacturing and ground equipment

Key Events

- World Space Week 'Exploring New Worlds in Space'

Demand Drivers

- Strength of Indian organizations such as ISRO in launching satellites at low cost
- Production of satellites parts and satellites with small payloads at low cost

Potential for Global Expansion	Strengths
<ul style="list-style-type: none"> US, UK, Germany, France, Japan, Russia and South Korea 	<ul style="list-style-type: none"> Capability to launch small payload satellites at low cost Expertise in multiple launch technologies
	Opportunities
	<ul style="list-style-type: none"> Major opportunity for low-cost satellite manufacturing for private players and SMEs Industry consortiums to participate in production of PSLVs and regional navigation satellites Large satellite order book of around INR 2,800 million (\$42.8 million) for third parties
Linkages	Growth Enablers
Make in India <ul style="list-style-type: none"> Enhance capacities in the private sector to foster B2B collaborations Increase in low-cost manufacturing facilities to encourage private participation in manufacturing subsystems and components for satellites 	<ul style="list-style-type: none"> Government has increased space budget estimate for FY2017-18 by more than 20%, to INR 90.94 billion (\$1.35 billion) to provide initial funding for two new space missions to Mars and Venus Government approval for building its own space station. Government to set up 'Space Parks' for private players to set up facilities to make subsystems and components for satellites
Start-up India <ul style="list-style-type: none"> Start-ups in satellite manufacturing are leveraging technologies, infrastructure and manpower to build space-based services 	
Case Study	
<p>In February 2017, India's ISRO launched a record 104 satellites, taking its tally of foreign satellites launched till date to 180. The latest launch comprised three of ISRO's own satellites, while the remaining 101 were from six countries. ISRO expects to recover almost 50% of the mission's cost from payments for foreign launches</p>	

For details, see page 115

Railway Services



Sector Overview

Global Industry

- The size of the global rail market reached \$170 billion in 2015, and is expected to reach \$195 billion by 2021

Indian Industry

- 4th largest rail network in the world
- Largest employer in the country with 1.4 million employees
- The turnover of Indian railways was \$25.2 billion in 2016 and is expected to reach \$44.5 billion by 2020
- Facilitated movement of 8.2 billion passengers and 1.1 billion tons of freight in 2015-16

Key Events

- International Railway Summit, Kuala Lumpur

Demand Drivers

- Urbanization and digitalization will sustain growth
- Growing middle class population
- Setting up of infrastructure for high-speed trains

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> South-East Asia, Africa 		<ul style="list-style-type: none"> The 108,706-km network facilitates movement of 12,617 passenger trains. It has 6,853 stations, 240,000 wagons, 63,045 coaches, and 10,773 locomotives
		Opportunities
		<ul style="list-style-type: none"> Expected investment of \$137 billion in metro rails by 2020 Significant potential in O&M services as government focusses on upgradation of facilities, and station re-development 17 sectors in railway operations allow 100% foreign/private investment
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none"> Open Wi-Fi to be provided at 400 stations Plan for construction of six dedicated freight corridors along the Golden Quadrilateral 	Digital India <ul style="list-style-type: none"> Stations to be equipped with Cloud-based railway display networks Plan for selling unreserved tickets through e-wallets 	<ul style="list-style-type: none"> The government has cleared the setting up of a new Railway Development Authority (RDA) which, apart from recommending passenger fares and freight charges, will also regulate the sector, which will be opened to private players
Case Study		
<ul style="list-style-type: none"> Centre for Railway Information Services has recently upgraded the e-ticketing system. The new system is based on an in-memory database capable of handling big data. Three million users have migrated; it provides dynamic load balancing to be able to seamlessly manage high demand during peak hours. ISRO helps railways with remote sensing at unmanned railway crossings using IRNSS and GPS. 		

For details, see page 120

Professional Services



Sector Overview

Global Industry

- Global professional services market size : \$3.75 trillion in 2015
- Global Management Consulting market: \$321 billion in 2016
- US accounts for 40% of professional services market with \$1500 billion in 2015

Indian Industry

- Indian Management consulting market: \$ 5.4 billion (INR 348 billion) by 2018
- \$28.4 billion Management consulting exports market
- 10,330 management institutes and 700,000 faculties.
- 2 million enrolments in management courses

Demand Drivers

- Diverse accounting proficiency
- Skilled talent pool
- Proficiency in English language
- Technology in Professional Services
- Popularity of R&D hubs in India

Audit Professionals in India

- ICAI members: 253,369
- American Institute of CPAs: 664,532
- Institute of Chartered accountants in England and Wales: 147,000

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> • Audit and Accounting: US and UK • Management Consulting: US, Europe and APAC and ASEAN countries • Architecture and Engineering Services : Mid-east and Asian countries 		<ul style="list-style-type: none"> • Strong technology presence and local demand • Growing Export market for Audit and Management Consulting • Large pool of skilled and unskilled labor • Proficiency in English helps in outsourcing demand
		Opportunities
		<ul style="list-style-type: none"> • R&D centers in India • Growing Demand for Audit and Management Consulting • Shared Service centers in India (Multi National) • Growing domestic market • Preference to low cost high quality products • Architectural outsourcing
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none"> • Start-ups in professional service space • New investments due to liberal rules • Huge boost to Domestic market and Employment 		<ul style="list-style-type: none"> • Large presence of shared services centers in India • IndAS converged with IFRS has been a catalyst for expansion • Developing talent pool in India which is accredited for the global accounting and auditing standards • Promotion of trade agreements for easy promotion of professional services
Skill India <ul style="list-style-type: none"> • Talent pool to provide different professional services • Language proficiency and vocational skills to promote outsourcing 	Start-up India <ul style="list-style-type: none"> • Start-ups in professional service space • New investments due to liberal rules • Huge boost to domestic market and employment 	<ul style="list-style-type: none"> • Liberal FDI in some sectors
Case Study		
ICAI Cloud Campus – Online mentoring to enable students interact with Faculty Members and clear their doubts/ questions		

For details, see page 123

Tourism & Hospitality



Sector Overview

Indian Industry

- Tourism sector's direct contribution to India's GDP: \$47 billion in 2016
- In 2016, Foreign Tourist Arrivals (FTAs) were 8.9 million as compared to 8.3 million in 2015
- Foreign Exchange Earnings (FEEs) from tourism was INR 1,556.50 billion (\$24.4 billion) in 2016
- Tourism and hospitality sector generated FDI inflows of INR 73.5 billion (\$1.1 billion) in 2016
- Improvement in Tourism rankings from 52nd in 2015 to 40th in 2016 due to liberalised visa regime

Key Events

- World Tourism Forum, May 2017, Lucerne, Switzerland

Demand Drivers

- India offers new and relatively cheaper tourism destination with vast geographical diversity, large coastline with attractive beaches, 30 World Heritage Sites and 25 biogeographic zone
- Diverse portfolio of niche tourism products – cruises, adventure, medical, wellness, sports, eco-tourism, film and religious tourism
- Dependable and low-cost medical tourism industry in India is expected to touch \$8 billion by 2020
- The Visa on Arrival scheme extended to 180 countries in 2016. A five-year tax holiday offered for 2, 3, and 4 star category hotels located around UNESCO World Heritage sites (except Delhi and Mumbai)

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> USA, Bangladesh, UK, Australia, Russia, Canada, Malaysia, Germany, China, Sri Lanka, Singapore, France, Japan, Afghanistan and Nepal 		<ul style="list-style-type: none"> Growth of 'e-Tourist Visa', 'e-Business Visa' and 'e-Medical Visa' Multilingual proficiency of guides Set up of Hospitality Development and Promotion Board (HDPB), to monitor and facilitate hotel project clearances and approvals
		Opportunities
		<ul style="list-style-type: none"> Increase in medical tourism with world class hospitals and skilled medical professionals India to host the Under-17 football World Cup in October 2017, aimed at boosting sports tourism India's 7,500 km coastline can be used to tap potential for cruise tourism Untapped potential in East and South India (4% tourists visit East India and 18% visit South India)
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none"> 100% FDI allowed in tourism construction projects, including the development of hotels, resorts 	Digital India <ul style="list-style-type: none"> E-Visa system extended to 161 countries Launch of Incredible India app, DigiLocker (for storage of physical documents) Connecting all gram panchayats under Bharat Net initiative 	<ul style="list-style-type: none"> Provision to offer pre-loaded sim cards to foreign tourists arriving India on e-Visa Increased government initiatives such as Swadesh Darshan, Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASAD) Incentives offered by state governments include subsidised land costs, relaxation in stamp duty, and exemption on sale/lease of land, power tariff incentives, concessional rate of interest on loans, investment subsidies/tax incentives, backward areas subsidies and special incentive packages for mega projects
Skill India <ul style="list-style-type: none"> Set up of Tourism and Hospitality Skill council Set up of National Skill Development Agency (NSDA), National Skill Development Corporation (NSDC) 		
Case Study		
<p>The government of India launched an international marketing campaign, Incredible India to promote tourism in India to the global audience. It promotes India as a desirable destination among international travellers from the US, Europe and Asia-Pacific and reaches out to travellers in a cost-effective way.</p> <p>Rollout of liberalised visa regime covering 161 countries in 24 airports and 3 ports for e-visa increases</p>		

For details, see page 131

Wellness



Sector Overview

Global Industry

- Globally, wellness industry represents a \$3.7 trillion economy, with a growth of 10.6% from 2013-2015.
- Global yoga market is estimated at \$80 billion

Indian Industry

- The wellness market in India had a turnover of \$13 billion in 2015, it is expected to grow at a CAGR of nearly 12% to reach \$23 billion by 2020.

Key Events

- Global Wellness Summit, Florida
- International Yoga Day

Demand Drivers

- Emerging global middle class with rising disposable income
- Increasing awareness and availability of herbal and Ayurveda products
- Focus on preventive healthcare
- Rising cost of healthcare in the world

Potential for Global Expansion		Strengths
<ul style="list-style-type: none"> Online and onsite training by leading yoga institutes for global audience Global demand arising from USA, Bangladesh, UK, Sri Lanka, Canada Certification for yoga teachers and Ayurveda practitioners from leading Indian institutes 		<ul style="list-style-type: none"> Increasing demand for ethnic products Great potential of India with the presence of several Yoga centers, naturopathy centers Advantage of having young population with the willingness to adopt to new fitness mantras
		Opportunities
		<ul style="list-style-type: none"> Significant tourist movement to India for Ayurveda and Yoga
Linkages		Growth Enablers
Make in India <ul style="list-style-type: none"> 100% FDI is permitted in the AYUSH sector India is the second largest exporter of Ayurvedic and alternative medicine in the world and has developed vast AYUSH infrastructure comprising of 736,538 registered practitioners 	Digital India <p>Initiatives such as National Health Portal to provide general information on health and diseases and multiple mobile apps, like the Swasthya Bharat App</p>	<ul style="list-style-type: none"> Growing consumer interest in health, travel, and new experiences Growing urbanization and changing lifestyle Easy access to beauty and wellness products through online shopping Separate ministry named AYUSH to promote wellness sector Strong support by the Government by recognizing “Wellness” as one of the priority sectors in its Make in India campaign Ancient knowledge of yoga, meditation, spa and ayurveda for preventive health, wellness and wellbeing.
Skill India <p>Beauty and Wellness Skill Development Council (BWSSC) established to ensure the generation of skilled manpower in the sector</p>	Start-up India <p>Setting up of specialized treatment centers</p>	
Case Study		
<p>The Ministry of AYUSH observes the International Day of Yoga on 21st June every year. In 2016, an estimated 5 million people participated in yoga training programmes in India over a period of one month.</p>		

For details, see page 136

Next Gen Cities



Sector Overview

- Envisaged investment of \$40 billion in developing 100 cities during the Smart City Mission period of 5 years
- 30% of proposed investment in the ICT sector towards developing smart solutions for urban residents
- Facilitate requisite infrastructure and services for 40% of Indian residents in the urban areas by 2035

Potential for Global Expansion

- The Smart Cities Mission has attracted funding from multilateral donor agencies like DFID, World Bank in developing key Indian cities as Next Gen Cities
- The Smart Solutions proposed as part of the Smart City plans are likely to facilitate large investments from global SI firms

Strengths

- Top-down strategy for solutions development
- Convergence with other Government schemes
- Inclusive governance through citizen participation at all levels

Opportunities

- Large untapped market
- Growing demand of ICT enabled smart urban services
- Digitization efforts of the government irrespective of the sector

Linkages

Make in India

- Enhancing capacity of large OEMs for catering to smart solutions envisaged under the Smart City Mission

Digital India

- Convergence to support development of smart & innovative solutions
- Digital empowerment of citizens

Growth Enablers

- 30% of proposed investment of \$40 billion in the ICT sector towards developing smart solutions for urban residents

Case Study

In April, 2015 the Government of India approved the Smart City Mission to develop 100 smart cities across the country with an outlay of INR 480 billion over a period of five years. Subsequently, the Prime Minister of India launched the Smart City Mission on 25th June, 2015 with the Ministry of Urban Development (MoUD), GoI as the nodal agency for creating these Next Gen Cities.

For details, see page 69

Facility Management



Sector Overview

Global Industry

- Market was estimated at \$1.12 trillion in 2016.

Indian Industry

- India market is expected to grow at 17% year-on-year and reach \$19 billion by 2020.

Demand Drivers

- Increasing urban development and modernization of office spaces are driving the growth in the sector.

Potential for Global Expansion

- Global companies are investing in India in setting up their operations. Some of the leading US players are already operating in India.

Strengths

- iCloud based systems used by companies to provide top quality service.
- Diversification into IT/Healthcare/Services and financial sector.
- Digitization of human capital and resource management.

Opportunities

- Increased use of technology – ATM machines
- Increased security awareness
- Growth of urban infrastructure

Growth Enablers

- Robust infrastructure development roadmap of the government.
- Policy initiatives like RERA, GST, and infrastructure status for affordable housing are making India an attractive destination for corporates to expand operations.

Case Study

- One of India's leading facility management firm is working with government, semi-government and private sector for development of gardens and landscapes, roads, rural electrification projects, factory construction and relocation.
- One of the leading multi-national companies has set up operations in India and provides asset services and manages Corporate Offices, Information Technology Parks, Retail Malls, BPOs, Call Centres, Banks, Financial Institutions and Residential Complexes.
- Bus terminal in Vadodara has been built under a public-private partnership with world class facilities and Airport like design. The realty firm involved in the construction has been given a 31 year contract for the maintenance and cleanliness of the facilities.

Exhibition and Event Service



Sector Overview

Global Industry

- Global exhibition market had a turnover of \$55 billion and attracts nearly 260 million visitors annually.

Indian Industry

- Indian event industry is projected to be worth nearly INR 960 billion (~\$14.5 billion)
- Growth rate expected to be ~ 5.2% year-on-year

Growth drivers

- Market is largely driven by an increase in the need for specialized, effective, and high-quality exhibition events.
- Social media and search engine marketing.
- Increasing demand for sophistication.

Strengths

- Use of technology in organizing exhibitions
- Achieving efficiency by use of analytics and other tools
- Availability of niche specialists

Opportunities

- Growth of India's industrial engineering, garment, transport equipment and IT/telecoms sectors are helping to create more demand
- Ministry of Tourism is emphasizing on the potential of MICE Tourism and the new tourism policy has identified it as an important product to increase tourism revenue.

Growth Enablers

- Supportive government policies and regulations
- Outstanding infrastructure for meetings and events
- Connectivity with other major destinations worldwide

Case Study

Vibrant Gujarat: The 8th edition attracted 33000+ global participants, 100+ countries and 12 partner countries (Australia, Denmark, Canada, Japan, US, UK, etc.) to connect the global investor with India and the state, showcase innovation and best practices, and discuss their application to the state and the nation, empower India to compete with the best global economies and provide a platform for global business networking. MoUs touched INR 20 trillion in defence, aerospace, mining, mineral, chemicals, steel, automotive, IT, etc.

For details, see page 143

Trade Facilitation in Services

The services sector has perhaps become the most important part of most economies across the globe and assumes special importance for the Indian economy, especially its role in driving the economy forward to greater heights.

The Indian economy has grown in its own unique way as reforms of the 1990s paved the way for growth of the services sector before any significant leap in the manufacturing sector. The progress of the service sector meant a gain in sophistication of services along with the sector accounting for a major share of the economy.

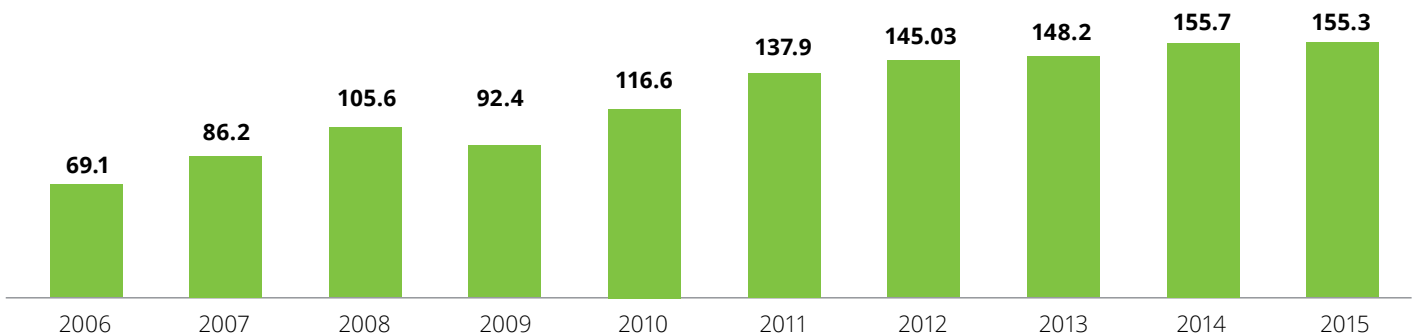
Gains in services leading to export growth

Indian export story has also benefited from its strength in the services sector. This is evident from the trade data. Rapid growth in services has meant big strides in exports of services too. This has been possible in the last decade due to information and communication technology revolution of mid-1990s and a boost to growth in technology, transportability, and tradability that have in turn changed the nature and tradability of services^{6 7}.

India's service exports grew almost ten-fold in the past 15 years, its share in global services exports (such as IT services) being

almost double than that of its share in global merchandise exports. India's share of global exports of commercial services increased to 3.2% in 2013 from 1.2% in 2000. In fact, during the period from 2001-2013, CAGR of world commercial services exports was 10% with India being at the top amongst the 15 top economies registering growth at 20.1%, followed by China at 16.5%. India stands as the eighth largest services exporter in the world. The services sector is also more open, as calculated by total trade including services as a percentage of GDP, as compared to the merchandise trade sector⁸.

Figure 1: Indian exports of commercial services (\$ billion)



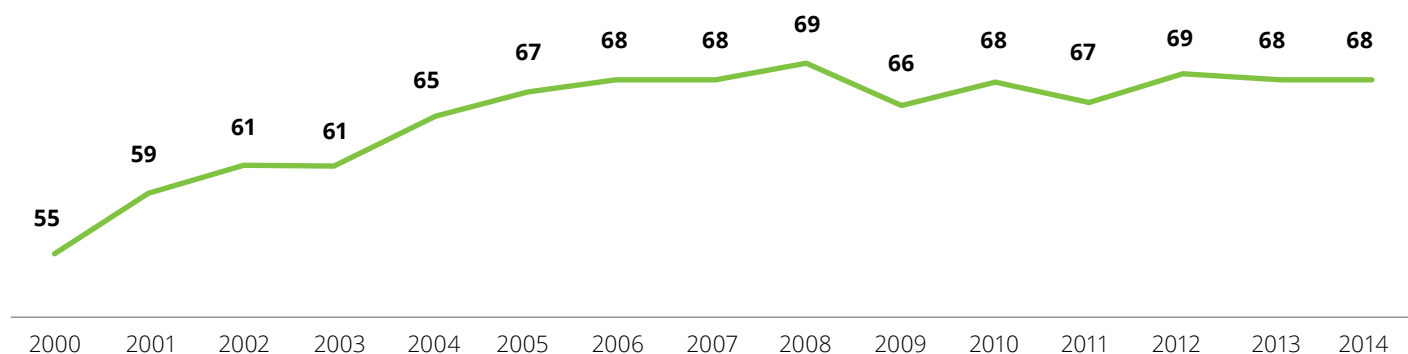
Source: World Trade Organization

Furthermore, exports in services have kept pace with the changing global dynamics and shift towards more technology adoption in all areas. The technology and business services are some of the most dynamic in the world. India's major services exports are computer services followed by business services and then technical and trade related services.

The success of these services can be assessed by looking at the proportion of ICT related service exports, which have grown manifold since 2000 and are above 67% as of today. It is no surprise then that Indian service exports are even more sophisticated than the average level of high income countries⁹.

These advancements have also had a qualitative impact on services exports as rapid growth of such services that do not require face-to-face interaction, have the potential of being stored and traded digitally.

Figure 2: ICT services exports as % of total services exports



Source: World Bank

Foreign investment plays its part¹⁰

It is important to note the role that foreign direct investment has played in the evolution of the Indian services sector. The past two decades have seen significant growth in FDI inflows in India, with services being the major beneficiary. The combined FDI share of the top 10 service sectors is 53.3% of the cumulative FDI equity inflows during the period April 2000-October 2015. While total FDI inflows grew by 27.3% in FY15, FDI inflows to the services sector, including the top 10 services, grew by 70.4%. A further expansion can be seen in FDI inflows in core services, which have touched \$5.3 billion in FY17 (Apr-Sep), which is close to \$6.9 billion that was achieved for the last full financial year of FY16. Services contributed 17.2% to total FDI inflows in FY16, and this figure has grown to almost a quarter of total FDI inflows, or 24.5%, in the first two quarters of FY17. Thus, as a World Bank study of 2004, also underscored, there is a definitive positive correlation between the level of liberalization and growth in service subsectors in India. Hence as global integration increases and as global capital seeks more profitable sectors for investment, trade in services is bound to increase and may be faster than trade in merchandise.

Before delving deeper into how trade in services can be increased, it is important to understand how are services measured and classified. Unlike trade in goods which can easily be tracked as being bought and sold, the nature of services is such that it needs further clarification.

Classification of services

The World Trade Organization (WTO) has come up with a four pronged definition under a General Agreement on Trade in Services (GATS) dependent on the territorial presence of the supplier and the consumer at the time of the transaction¹¹.

01. **Mode 1 — Cross border trade:** from the territory of one member into the territory of any other member
02. **Mode 2 — Consumption abroad:** in the territory of one Member to the service consumer of any other Member
03. **Mode 3 — Commercial presence:** by a service supplier of one Member, through commercial presence, in the territory of any other Member
04. **Mode 4 — Presence of natural persons:** by a service supplier of one Member, through the presence of natural persons of a Member in the territory of any other Member

These definitions are significantly broader than the concept of services in Balance of payments and essential to further understand how trade in services can evolve.

Trade Facilitation in Services (TFS) Agreement

Given the importance of services and our inherent strength in providing high quality services at competitive costs the Indian policymakers have rightly been pushing for a TFS agreement. In fact, India has already tabled a paper 'Concept Note for an Initiative on Trade Facilitation in Services', which was followed by submission of an "elements paper" in November 2016. The objective was to outline the broad contours of a Trade Facilitation in Services (TFS) Agreement. This assumes special importance in today's world when countries seem to be moving towards protectionism rather than further globalization. The TFS would essentially try and ease global services trade with the aim of reducing barriers that service providers face. Some of the barriers that the proposal aims to reduce are high fees, opaque and cumbersome procedures and complex requirements for licensing and movement of persons. The intention of the agreement is not to get more market

access but to ensure that already existing market access gained from current and future liberalization commitments are effective and meaningful.

The scope of the TFS agreement would include measures by members affecting trade in services across all modes of supply. In case of services supplied through “mode 3” (a foreign company setting up subsidiaries/branches to provide services in another country), it suggests streamlining via a “single window” clearance system. For cross-border movement of services suppliers, also known as “mode 4”, it suggests simplifying work permit and visa procedures while ensuring that policies relating to taxation, fees and social security contributions do not unfairly disadvantage foreign suppliers.¹²

The TFS includes as a crucial element, ‘facilitating movement of natural persons’ to address Mode 4 delivery of services as defined in the General Agreement on Trade in Services (GATS). Mode 4 covers natural persons who are service suppliers or work for service suppliers and are present in another WTO member country to supply a service. This has become important in the current global scenario, as there is growing discontent surrounding migration that negatively impacts services trade. Restrictions on entry and exit have a direct impact on the ease of conducting business.

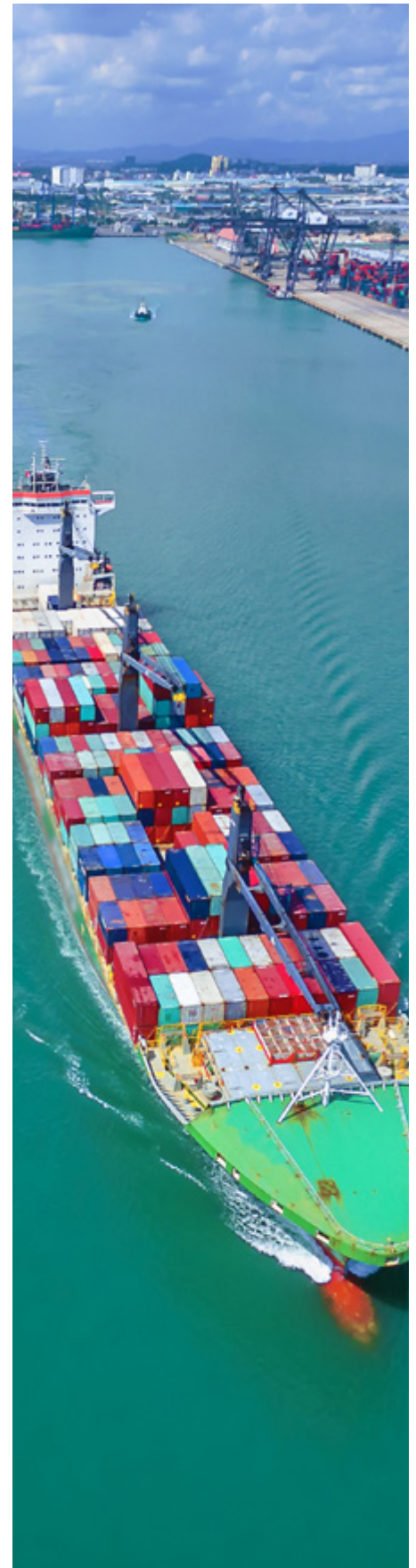
The TFS paper also suggests facilitative provisions ‘for the meaningful supply of Mode 4 services as well as clarification and publication requirement that allows for providing and making publicly available, explanatory material on all relevant immigration formalities.’ Facilitative provisions could include multiple entry permits as well as ‘exemption of committed categories of natural persons from payment of additional costs and charges, including social security payment’. Facilitating cross-border investment as well as consumption abroad besides more transparent administration were also included as specific requirements. Labor market and economic needs tests are also provided for¹³.

Given India’s fast growing global services footprint, it was imperative that the country take the initiative in moving for a TFS Agreement. An agreement, in conjunction with enhanced liberalization commitments, would help realize the fuller potential for trade in services for the domestic economy.

Conclusion

The World Bank in its latest global outlook¹⁴ pointed out that protectionism had been rising and research cited in the outlook showed that in 2016, the G20 group of countries had taken more trade restrictive measures than trade facilitating ones. It was seen that the policy announcements were made keeping in view the short term dynamics and did not actually address the structural issues facing the economy. Such protectionist trade policies create uncertainties as they are meant to provide immediate stimulus and therefore tend to be more variable and less consistent. On the other hand, services have become a major part of trade flows. Given the potential for growth in services exports, services-sector negotiations both at multilateral and bilateral/regional levels have great significance for India. In this respect, India has gone ahead and made significant progress by signing comprehensive bilateral trade agreements with the governments of South Korea, Japan, Malaysia and Singapore. India also has a free trade agreement (FTA) with ASEAN that came into effect from mid-2015 while also being a part of the mega regional FTA Regional Economic Comprehensive Partnership.

Given these initiatives and the need to grow trade in services, hurdles to growth must be addressed. Trade facilitation in services is a positive move and can go a long way in alleviating these concerns by helping increase the ease of doing business while providing some more certainty to service providers.



Focus Sectors

1. Skills

Industry profile

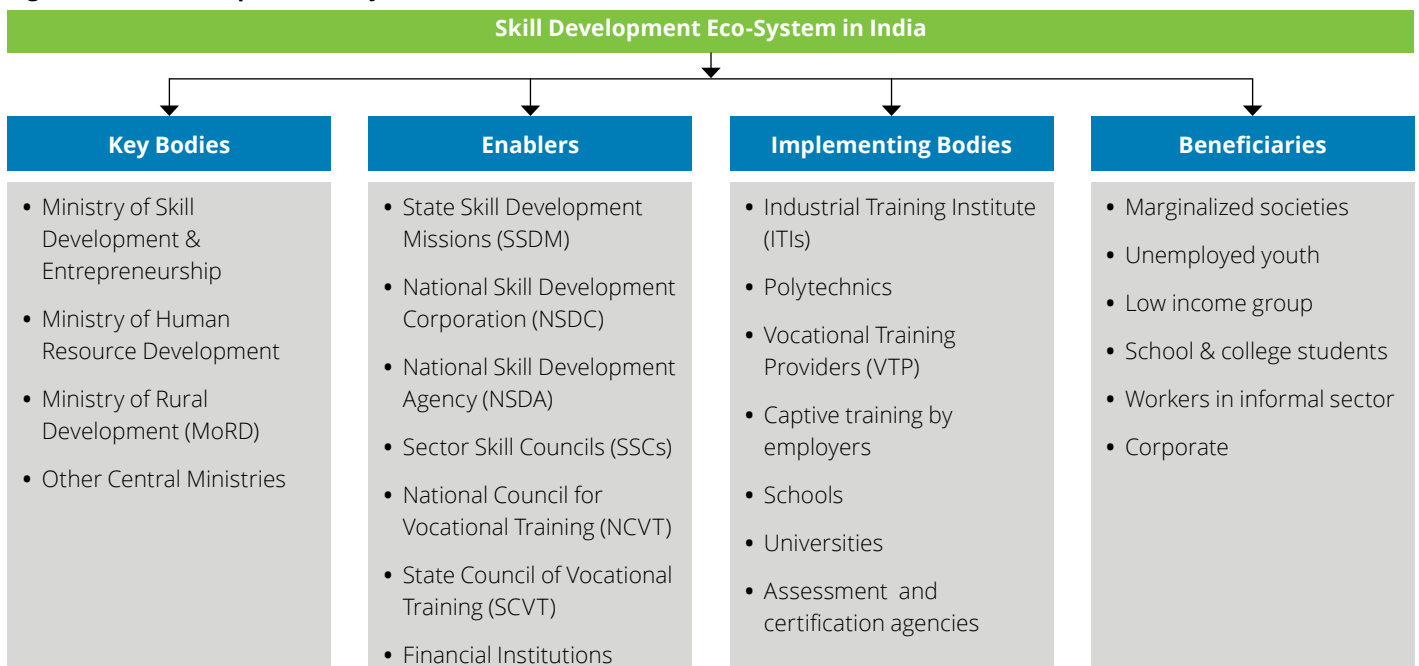


According to Central Intelligence Agency (CIA), the working age population (15-54 years) accounted for 58.9% of 1.26 billion population in 2016 and is expected to increase to 65.9% of population in 2022 (891 million).¹⁵ India has been one of the fastest growing large economies in recent years and is expected to be a

growth engine for the global economy in the next decade. In order to sustain the growth momentum, interventions in skill development ecosystem namely infrastructure, pedagogy and trainers are key priorities. The provision of skills training in India is quintessential to sustain growth, development and business opportunity.¹⁶

India's proportion of trained workforce is among the lowest in the world with only 10% workforce trained in vocational trades through formal/ informal modes.¹⁷ The current skills and vocational set-up in India include Industrial Training Institutes (ITIs), Polytechnics (both Public & Private), and Private Vocational Training Providers

Figure 3: Skill development ecosystem in India



Source: Konrad Adenauer Stiftung – Skill Development in India, 2015

(PVT). The various schemes by National Skill Development Corporation (NSDC) and other Central Ministries in coordination with Ministry of Skill Development and Entrepreneurship (MoSDE) caters to around 3.5 million people, falling short of the of 13 million who are expected to join the workforce every year by 2022.¹⁸

In order to give thrust to the vocational skilling ecosystem, the government has taken multiple initiatives such as the formation of Ministry of Skill Development and Entrepreneurship (MoSDE) in 2014 and launch of National Policy on Skill Development and Entrepreneurship 2015. Additionally, Skill India Initiative was launched by Prime Minister in 2015 to train 400 million people by 2022. The State governments have also set up State Skill Development Mission and new skill development departments. Various models with Private sector involvement have been piloted and are being encouraged. Thus, skill development landscape is set to provide ample opportunities for private sector involvement.

The government has also focused on skill development in the Union Budget 2017-18. This budget aims to:

- Set-up 100 India International Skill Centres across the country.
- Extend Pradhan Mantri Kaushal Kendras (skill centres) to 600 districts in FY18 (currently spread across 60 districts).
- Launch Skill Acquisition and Knowledge Awareness for Livelihood Promotion programme (SANKALP) to provide vocational training to 35 million youth.
- Launch next phase of Skill Strengthening for Industrial Value Enhancement (STRIVE) to focus on improving the quality and market relevance of vocational training provided in ITIs and strengthen the apprenticeship programmes through industry-cluster approach.
- Impart mason training to 500,000 youth in rural areas by 2022¹⁹.

Growth drivers for the industry

- **Government Initiatives:** The government has undertaken several initiatives to improve skill development and vocational training in India, including setting up of Indian Skill Development Services (ISDS), and provision of entrepreneurship education and training in ITIs and Vocational Training Centres.
- **Online channel gaining momentum:** With rising internet penetration in India, vocational training companies are choosing the online platforms to offer courses and expand their outreach.
- **Corporate partnerships:** Vocational training companies have entered into agreements with corporate houses to train employees with the required skill sets.
- **Private participation:** Private players are also showing interest in developing skills in their respective sectors²⁰.
- **Foreign languages:** Multinational companies in India and Indian conglomerates have growing demand for candidates with foreign language skills. The sectors such as IT, Publishing, Advertising, Entertainment, Mass Communications, Aviation, Hospitality & Tourism, Education & Training and Public Relations have greater demand for such professionals. The popular foreign languages in demand are French, Arabic, Mandarin, Korean, Japanese, German and Spanish. Various universities and institutes in India offer courses in these languages from certificates to doctorates²¹.

Potential for global expansion

According to the World Economic Forum's Human Capital Report 2015, India ranks 100 out of 124 countries in terms of learning and employment of its human capital, while Finland, Norway and Switzerland hold the top three positions in this index. In terms of expanding globally to impart skills, Indian players can focus on countries with the lowest rankings on the human capital index. Some of these include Nigeria, Myanmar, Pakistan, Nepal, Chad, and Yemen²².

Government tie-ups to enhance skills

- National Skill Development Corporation of India (NSDC) signed a MoU with Center for Research & Industrial Staff Performance (CRISP) to explore national and international opportunities for strengthening skills development in India²⁸.
- India and Germany have signed an agreement on vocational education and skill development with a budget of \$3.37 million, which will help create and improve cooperative workplace-based vocational training in India's industrial clusters²⁹.
- Ministry of Skill Development & Entrepreneurship (MoSDE) and the Wadhvani Operating Foundation have announced a tie-up to empower Government of India's Pradhan Mantri Yuva Udyamita Vikas Abhiyaan on entrepreneurship³⁰.
- India and Switzerland have signed an agreement to establish formal cooperation in the fields of skills development and vocational and professional education and training³¹.

Government initiatives

Government has launched various programs to enhance the skill development in India. Some of these include:

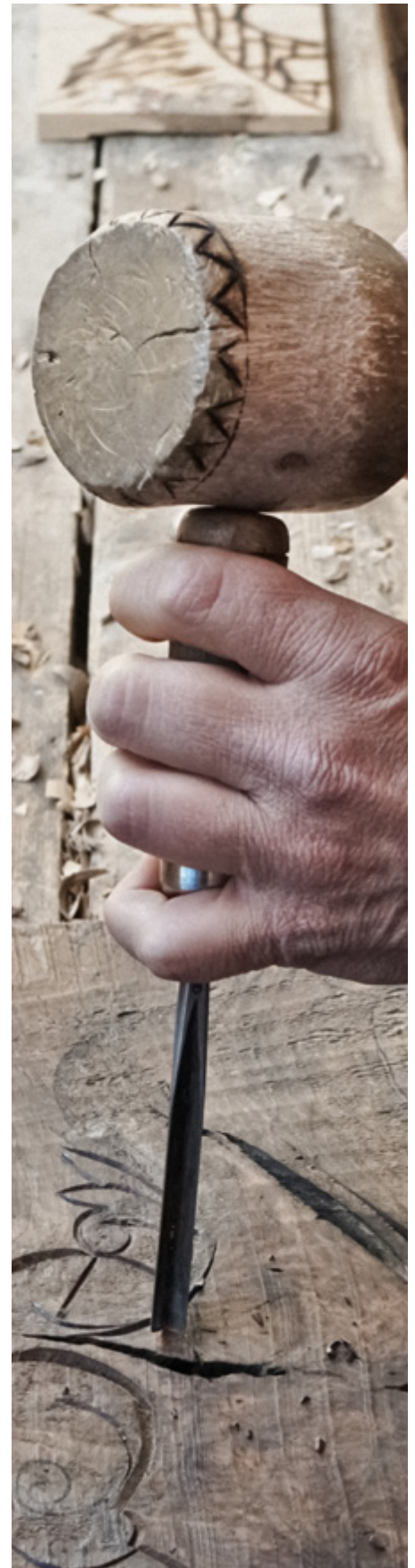
- **Skill India:** The government launched Skill India campaign in 2015 aiming to skill 400 million workers by 2022. Under the program following initiatives are taken:
 - **Pradhan Mantri Kaushal Vikas Yojana (PMKVY):** PMKVY is the flagship program under the Skill India Initiative and it includes incentivizing skill training by providing financial rewards on completion of training to the participants. It aims to impart skills to 10 million youth of the country during 2016 to 2020²³.
 - National Skill Development Mission has created an elaborate skilling eco-system and imparted training to 7.6 million youth²⁴.
 - **National Policy for Skill Development and Entrepreneurship, 2015:** Government has identified a skills gap for 110 million workers in 20 key sectors by year 2022, of which 55 million are from rural India. The policy aims to train these workers and provide them with job. It currently has over 690 projects being implemented by 300 partners, in more than 330 trades from 82 industry sectors. Over 27,00,000 candidates have been trained and over 1,34,000 candidates have been placed in jobs in FY 2016.
 - **Skill Loan scheme:** It aims to provide loans of INR 5,000 to INR 150,000 to over 3.4 million youth to develop their skills in the next five years²⁵.
- **Digital India:** Government of India has initiated a program, i.e., IT for Jobs through Digital India in which they provide training to the youth in the skills required for availing employment opportunities in the IT/ITES sector. There are eight components with specific scope of activities under this initiative:
 - IT Trainings to people in smaller towns and villages– provide training to 10 million students from remote areas for IT sector jobs over the next five years.

- Training Service Delivery Agents- offer training to 300,000 service delivery agents as part of skill development to run viable businesses delivering IT services.
- Training Rural Workforce on Telecom and Telecom related services- teaching 500,000 rural youth in the Telecom Service Providers (TSPs) domain²⁶.
- **Ministry of Skill Development and Entrepreneurship:** Launched in June 2014, it is entrusted to make broad policies for all other ministries' skill development initiatives and National Skill Development Corporation (NSDC).
 - National Skill Development Corporation (NSDC): NSDC is a public private partnership organization incorporated in 2009 under the National Skill Policy (now under the Ministry of Skill Development and Entrepreneurship). Its main aim is to provide viability gap funding to private sector in order to scale up training capacity²⁷.

Conclusion and recommendations

The Indian Government has laid a special focus on expanding and improving the skill education and training in the country. The Policy on Skill Development and Entrepreneurship contains several initiatives which, if implemented earnestly, will go a long way in minimizing the demand-supply gap and challenges related to skill mismatch with industry requirements.

With increased thrust on manufacturing under the 'Make in India' program, the need for improving India's skill development mechanism is quintessential. It has been globally recognized that an efficient vocational education and training, will play a critical role in the industrial development and manufacturing success. There is a scope for international collaboration and assistance in India's skill development initiatives at all levels, including creating awareness, capacity building, setting standards, improving quality, as well as providing placement opportunities³².



2. Education

Industry profile



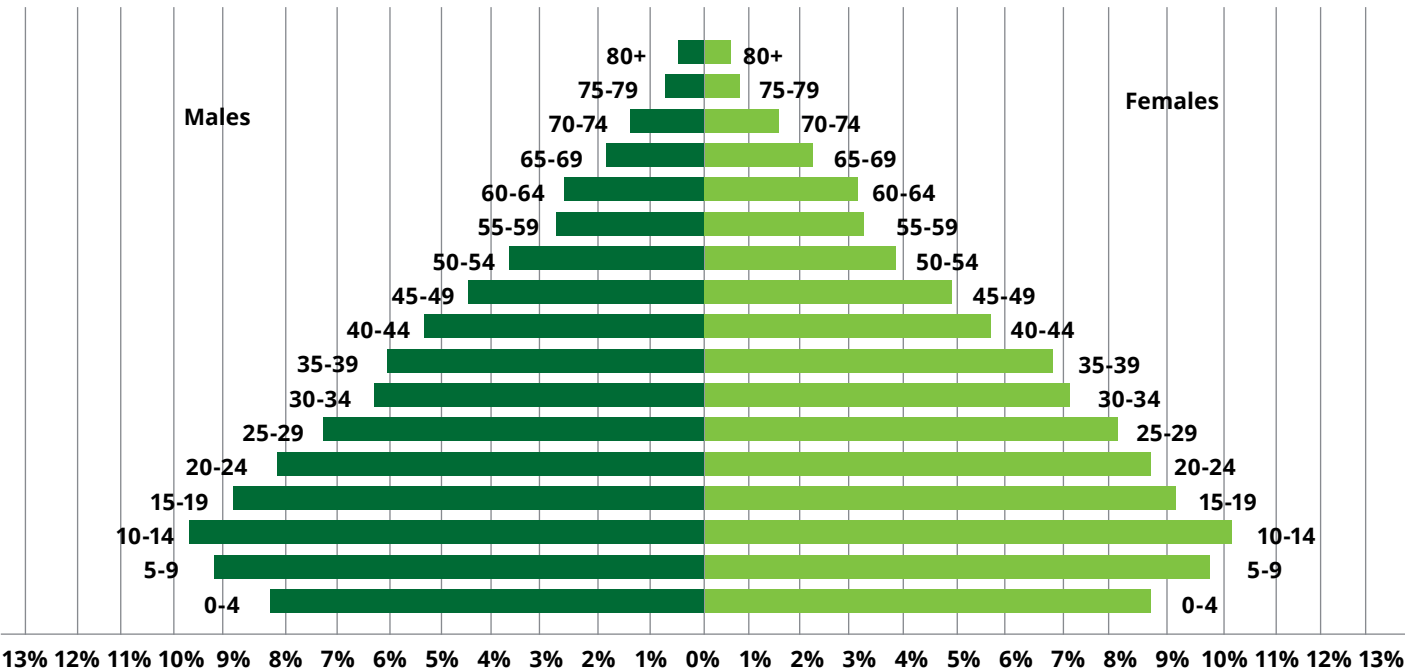
For the purpose of this report, Education Services includes K-12, Higher Education, Technical Education, and allied services.

India has the second largest education system globally, with a network of more than 1.52 million schools and 259 million

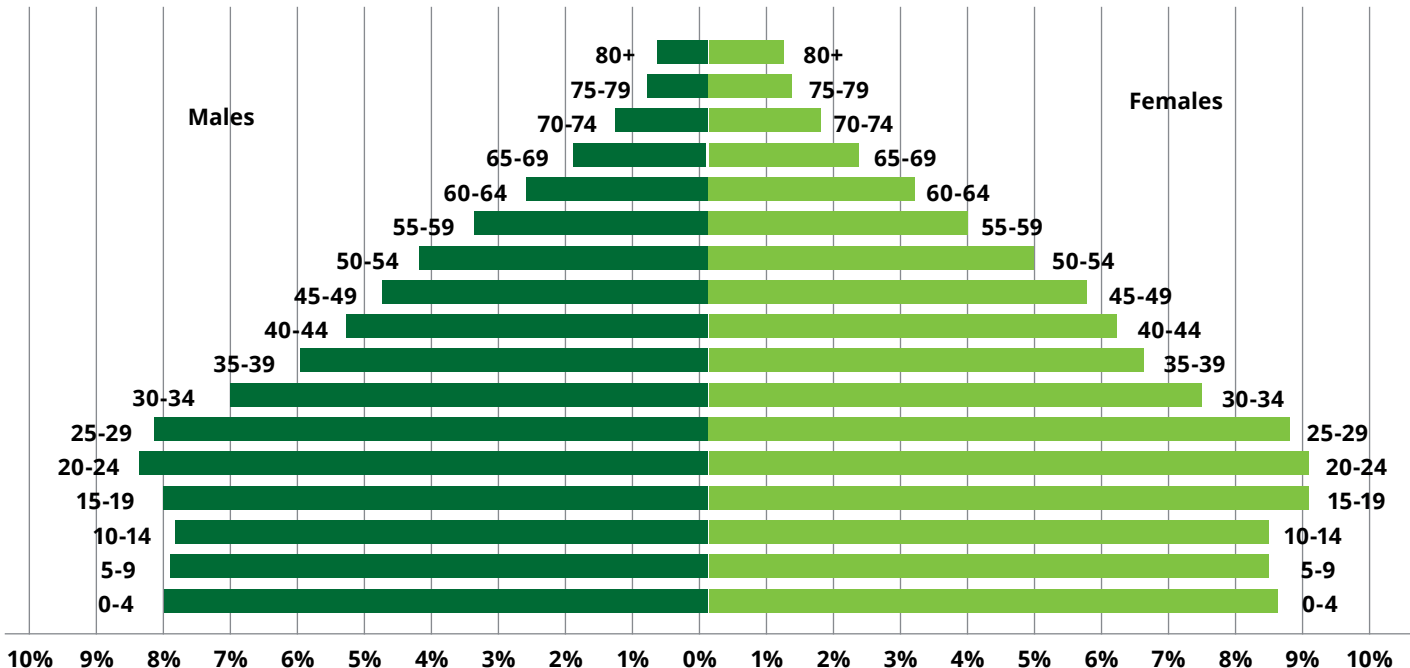
students enrolled in its schools. It has also one of the world's largest higher education systems with enrollments of ~33.3 million students in colleges, institutions, across 50,000+ higher education institutes and 750+ universities. Approximately 50% of the country's population is under the age of

25- the world's largest- leading to growing demand for education. International Labour Organization (ILO) states that by 2020, India will have one of the world's youngest population, with an average age of 29 years.³³

Population Pyramid- 2011



Population Pyramid- 2016



Source: Census India, Population Projections Report 2006

According to Central Intelligence Agency (CIA), Literacy rate in India is 71.2%, with male literacy ratio standing at 81.3% and that of females at 60.6% (2015)³⁴ which is less than the world average of 86.1% (2015). Government of India (GoI) is also set to boost the education sector by enhancing government spending as well as encouraging private sector initiatives in the sector. The government's initiatives such as its ambitious target to increase digital literacy to at least 50% in the next three years from the current 15%, is also opening up several opportunities for private sector to innovate and collaborate.³⁵

The Indian education sector is estimated to reach \$144 billion by 2020, from \$97.8 billion in 2016, with a large market share of the K-12 segment (kindergarten through 12th grade). The past few years has seen significant growth in investments in the sector. Technology-enabled education infrastructure, and informal education, including, vocational training, pre-school, test prep, child-skill enhancement are key areas wherein investment has been incurred.³⁶

According to Department of Industrial Policy and Promotion (DIPP), the total amount of FDI inflow in to the education sector in India stood at \$1.3 billion from April 2000 to December 2016.³⁷

Growth drivers for the industry

A number of enablers are facilitating the growth of the education sector.

- **Demographic dividend:** With over 500 million people in the age group of 5 to 24 years, India's advantage lies in the huge market for education. Additionally, India has a population of over 1.3 billion, wherein 20 million additional students enroll every year. With the expected growth in the population to 1.7 billion in 2050, the demand for education and related services is also bound to rise.
- **ICT and technological developments:** The pace of technological growth provides ample opportunities to deploy them in the sector, as also generating demands to develop, refresh and upgrade skill levels to keep pace with this market dynamics.

FDI Provisions for Education Sector

- The government allows 100% FDI in the primary education sector under the automatic route.
- A "not-for-profit" company incorporated under section 8 of the Companies Act 2013 can receive FDI if it acquires approval under FCRA (Foreign Contribution Regulation Act).
- Several foreign educational institutions have also opted for academic collaborations and partnerships without involvement of FDI through investment in "for profit" service/ management companies.
- The government has now also permitted 100% FDI in the construction development projects, related to educational institutions, subject to fulfillment of certain conditions.³⁸

- **Demand for skilled resources:** With increasing sophistication in technologies, companies demand employees who can deliver outcomes in services like big data, cloud, analytics, and other specialized domains, leading to higher demand for skilled workers.
- **Rise in awareness:** Collective initiatives of governments, NGOs, and private enterprises have helped spread awareness regarding the benefits of education, leading to increase in gross enrollments for higher education from 17.2 million in FY10 to 30.1 million in FY15.
- **Female labor force participation and demand for pre-school facilities:** Growing number and proportion of working women is resulting in need for childcare and pre-school facilities. Demand for organized pre-school services is also growing in smaller cities and towns.
- **Demand for informal education:** Informal education, coaching institutes and vocational training has been gaining momentum as individuals seek to or learn in smaller groups for better student-teacher ratio, or develop new skill sets through focused training programs.
- **Policy initiatives:** The government has undertaken several policy initiatives to improve access to education. A new National Education Policy (NEP) 2016 is being drafted. Government is also putting thrust on the sector through its initiatives such as, Rashtriya Uchchatar Shiksha Abhiyan and the World-Class University initiatives.³⁹

Potential for global expansion

According to UNESCO 2015 data, the number of Indian students in foreign universities stood at 234,000, while India hosted merely 39,000 foreign students in its universities and colleges. According to All India Survey on Higher Education (AISHE) 2015-16, foreign students in India come from 165 countries, but the top 10 countries constitute 62% of the total foreign students enrolled in higher education institutes. The highest share of students come from Nepal (21%),

followed by Afghanistan (10%), Bhutan (6%), Nigeria (5%) and Sudan (5%). Several Indian universities have set up campuses abroad to either attract global talent to its university, or offer expanded exposure to its students in its home campus (through twinning programs). The government is also pushing for a 'Study in India' initiative, which focusses on attracting foreign students to India. The AICTE is also working on preparing a management entrance test modelled on the US SAT exam, for Asian and African countries, and then launching it globally.⁴⁰

Government initiatives

Average government spend on education has hovered around 3.4% of GDP (\$63 billion) which is less than the average spend of 6% of GDP by developed and developing countries. However, the government's thrust on education ensures several reforms and increase in government spending for this sector, as reflected in several of its initiatives. The Union Budget 2017-18, allocated \$11.9 billion to the education sector.

- MHRD has launched Study Webs of Active Learning for Young Aspiring Minds (SWAYAM), a web portal where Massive Open On-line Courses (MOOCs) are offered. MOOCs is expected to disrupt the existing distance learning model. It provides affordable and flexible way to learn new skills, pursue lifelong interests and deliver quality educational experience at scale.
- FY17 Union Budget aims to provide entrepreneurship, education and training via MOOCs. The focus is on getting as many as 2,200 colleges, 500 government industrial training institutes, 300 schools and 50 vocational training centres on board for this initiative.
- Additionally, as part of the Right to Education Act, it has mandated the appointment of a special educator for children with learning disabilities so that they can be assimilated with other students.
- Proposal for introduction of a new system of measuring annual learning outcomes in schools, wherein emphasis

Partnerships and Joint Ventures with private companies

In 2016, the Ministry of Human Resource Development (MHRD) collaborated with DTH operator Dish TV to broadcast 32 educational channels on its platform. The channels would also enable live telecast of classroom lectures from premium institutions, including IITs⁴².

In 2015, the MHRD entered into a partnership with Tata Motors Ltd, Tata Consultancy Services Ltd and real-estate firm Hubtown Ltd, to open three Indian Institutes of Information Technology (IIITs), through Public-Private Partnership (PPP) mode at Nagpur, Ranchi, and Pune⁴³.

will be given on science education, and flexibility in curriculum to promote creativity through innovative content

- The government is introducing a scheme to promote 20 world class universities in India – 10 in the public sector which will receive funding support from the government, and 10 in the private sector.⁴¹
- **Digital India:** Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. Under the program following initiatives are taken:
 - All schools connected with broadband. Free Wi-Fi will be provided in all secondary and higher secondary schools (coverage would be around 250,000 schools).
 - Pilot MOOCs (Massive Online Open Courses) launched through SWAYAM portal.⁴⁴
- **Start-up India:** Many start-ups are entering to support education programs in remote rural locations.

Future prospects for the industry

- **Education SEZ:** Education SEZs will help in addressing the shortage of quality higher-education institutions in India and also draw students from other Asian nations and reduce the need for local students to spend large sums of money to study abroad. In FY16, Indian students spent \$1.98 billion in education-related overseas expenditure and \$2.47 billion in FY15. Despite the presence of large universities in India, Indian students are spending large amount of money on foreign education. Presence of education SEZs will act as an added attraction to foreign education institutions to set up campuses in India.⁴⁵
- **International universities:** At present in India, there is no legal and regulatory framework to allow foreign universities to set up campus in India.⁴⁶
 - In 2016, NITI Aayog had suggested three routes to permit entry of foreign education providers
 - A new law to regulate the operation of such universities in the country.
 - Amendment to the UGC Act of 1956 and deemed university regulations to let them in as deemed universities.
 - Facilitating their entry by tweaking UGC and AICTE regulations on twinning arrangements between Indian and foreign institutions to permit joint ventures.
 - Benefits for foreign universities in India
 - Foreign universities with high standards will increase competition and result in the improvement of higher educational standards in India.
 - There would also be gains in terms of availability of resources both human and financial, state-of-the-art teaching methodology, research and innovation.
 - Capital expenditure for setting up an institution is high. Entry of foreign universities and ease of FDI norms will offset some of these costs.
- **Participation in 'World-Class institutions' initiative:** India has had a noteworthy history in higher education, with ancient universities like Takshashila, Nalanda, and Vikramshila, attracting foreign scholars. In the Union Budget 2016-17, the government announced its intention of providing an enabling architecture to 10 public and 10 private institutions to emerge as world-class teaching and research institutions. These universities will aim to bring India at the forefront of global higher education, with focus on achieving global standards of quality and excellence.
- **Content development for digital learning:** India's digital learning market is growing at a fast pace. Use of Information and Communication Technologies (ICT) in education has led to the growth of digital platforms including smart classes, e-learning courses, blended learning, and app-based learning. Recent industry reports have projected the market to more than double - from \$2 billion in 2016 to \$5.7 billion in 2020, as per a Technopak report. This is also reflected in market trends. For example, Byju's Learning App caters to 200,000 school and college students, and attracts 30,000 new users every month.
- **Twinning programs:** Foreign investors can also invest in twinning or pathway programs, wherein a student can undertake one part of the course with the one institute and spend equivalent duration in another partner institute. Such programs can be implemented through collaboration or a partnership agreement.
- **Collaboration for technical education:** Subject to the AICTE Regulations, foreign institutions/universities can award degree, diploma, post graduate diploma and post diploma in technical education, by partnering with Indian institutions or on their own.

- **Training and facility construction:** Foreign players can also invest in the sector through course development training for educators, and providing infrastructure services including construction/development.
- **Tapping the informal market:** Significant demand is gaining momentum in the pre-school market driven by demographics and rising incomes and offers substantial opportunities. Other informal market segments such as coaching (online/ class room) is also a large market offering significant opportunities. For example, tutoring in the schooling segment is expected to grow from \$8 billion in 2011 to \$26 billion in 2020.⁴⁷

Conclusion and recommendations

India offers significant opportunities and advantages in the Education sector both from the point of view of attracting private and foreign players in education, as also for expansion of Indian start-ups and education providers abroad. As government continues to spend huge amounts on education, it is also encouraging collaboration with private sector players to both provide basic infrastructure and education in under-served rural areas, as also in the emerging areas of technology, digital, and quality enhancement. Growing demand for quality education at affordable prices acts as the foundation stone to recognize MOOCs in India. Keeping this in view, the government has made provisions in FY17 budget.

Through the Right to Education Act and several related initiatives (SSA, RMSA, RUSA), the policymakers are looking to universalize access to education. The New Education Policy, which is expected to focus on addressing gender discrimination, creation of educational tribunals, and strengthening education in the rural areas, is also on the anvil. Digital learning, supported by the government's Make in India and Skill India campaigns will provide further impetus to this sector.

3. Banking & Financial Services

Industry profile



India is a preferred destination for Financial Services. The Indian financial services market consists of banks, GICs, insurers, mutual funds, NBFCs, MFIs and Fintechs, etc. Two new banks were launched in 2015 and a host of new small finance banks and payment banks have started operations recently/will start operations. Non-performing assets (NPA) issue has plagued public sector banks in recent times and government has taken corrective measures to address it.

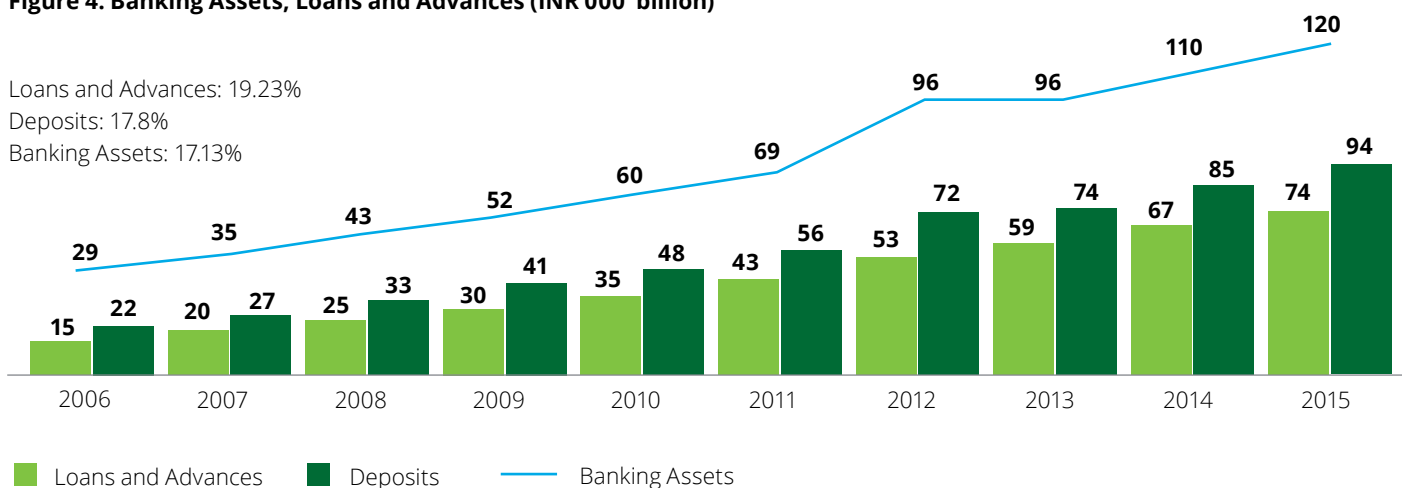
India has 24 life, 29 non-life insurers including 5 pure play health insurers. Other stakeholders in Indian Insurance market include agents (individual and corporate), brokers, surveyors and third party administrators servicing health insurance claims.

India's life insurance sector is the biggest in the world with about 360 million policies which are expected to increase at a CAGR of 12%-15% over the next five years. The insurance industry plans to hike penetration levels to 5% by 2020.

In the recent past, Foreign Investment Promotion Board (FIPB) has cleared 15 FDI proposals including large investments in the insurance sector, leading to a cumulative investment of \$1.09 billion. Insurance Regulatory and Development Authority of India (IRDAI) has given initial approval to Swiss, French, and German reinsurers to open branches in India. Both banking and insurance in India has seen good growth in the past, and this trend is expected to continue because of various supply and demand side factors.

Figure 4: Banking Assets, Loans and Advances (INR 000' billion)

Loans and Advances: 19.23%
Deposits: 17.8%
Banking Assets: 17.13%



Source: RBI

Growth drivers for the industry

Demand side

- Level of financial services penetration remains low, albeit with significant growth potential: While India is the fastest growing economy in the world, significant potential for financial services' growth exists, given penetration of financial services (bank loans/GDP, bank assets/GDP and mortgages/GDP) as compared to global peers shows significant room for improvement.
- Growing Income levels: Average household income in India grew by a CAGR of 4.83% between 2005 and 2014.
- Consumer behavior is evolving: Consumers becoming more connected, digitally influenced, more informed and more demanding.

Supply side

- Disruptive innovations: Digitization is an opportunity for banks that respond to the changing environment. For instance, FinTech is emerging as strong contenders to banks, globally, and in India. "Omni-Channel Banking" allows banks to use technology to manage consumer interactions across multiple channels. Transacting via smartphones, allows consumers a fair degree of mobility.
- Strong government and regulator push: Government and regulator push on digital, increased FDI limits, NPA management are expected to aid the growth of the financial services sector.
- Increased competition: Entry of new banks expected to put pressure on traditional players who will be forced to innovate in order to survive. The traditionally preferred "branch banking" channel, has experienced a significant shift. In the payments market, cash and credit cards are being replaced by digital options.
- Strategic arbitrage of GICs: India with 1000+ GICs, accounts for roughly 50% of all GICs worldwide. Indian GICs contribute ~25% of the Global offshore market. Their revenues in India in 2016 stood at \$22 billion⁴⁸. ~40% of these GICs are in Banking, Financial

Services and Insurance, and have a need for cost effective infrastructure, technology and talent to serve their global parents. Indian GICs today are setting the stage in the development of India as a source of strategic benefits, cost benefits and talent arbitrage. Large scale technology development in India, have enabled a paradigm shift toward Fintech. Growth in the Fintech space as a result, is positioning India on the global stage as an attractive investment destination. Parent organizations that are seeking value out of GICs, are increasing investments in talent, processes and innovative technologies.

Government and RBI initiatives

India is undergoing changes with a series of initiatives propelling the economy to a higher growth rate.

New Bank Licenses

- Liberalization through the financial inclusion initiatives of the RBI in the form of the issuance of banking licenses, allowing several new players – 2 Universal Banks, 8 Payments Banks (of the 11 licenses granted by RBI, 3 have surrendered it) and 10 Small Finance Banks - to enter the banking space in India and challenge the existing paradigms.
- Universal banking license is now available on tap.

Demonetization

- Removal of existing currency notes of INR 500 and INR 1,000 from system in November, 2016 in order to flush out black money.
- Resulted in huge deposits at banks and corresponding decline in interest rates
- Fillip to demonetization in the budget: No transaction above INR 200,000 permitted in cash subject to certain exceptions⁴⁹.
- Expected to encourage use of digital payment platforms and bring India's cash to GDP ratio down to single digits (It has reduced to 8.17%⁵⁰ from the pre-demonetization figure of 10.6%⁵¹). Financial services players are likely to fast-track their digital plans.

Focus on Aadhaar and other digital payment initiatives

- Aadhaar, the single largest digital identity solution in the country is now covering ~95% of the Indian population. Aadhaar numbers have been used to open bank accounts and mobile phone accounts.
- Paperless (Digilocker) – Digital records are available in the cloud, eliminating dependence on paper and storage. India Stack is a revolutionary example. A series of secure and connected systems allow data sharing. It creates an e-KYC (creation of a central KYC where any customer's KYC details available to all banks). It will lean on the subsequent three initiatives to make the digital economy work seamlessly.
- Presence less (Finger Prints, Retina Scans) – allow participation in any service from anywhere.
- Cashless (Aadhaar Enabled Payments Systems - AEPS) – Aadhaar Pay, a merchant version of AEPS, was launched to enable those who do not have debit cards, mobile wallets and mobile phones to make digital payments.
- Consent (E-Signatures) – give secured access to documents.
- One million biometric PoS machines (Micro-ATMs) were expected to be installed by March, 2017 and subsequently scaled to two million by September 2017 as per Union Budget 2017. By bringing banking to people's doorsteps, these Micro-ATMs have revolutionized digital payments by saving customers time and costs.
- Unified Payments Interface (UPI) is changing the face of digital payments in India by bringing everyone to the digital net. By using smartphones, it is facilitating instant transfer of funds under INR 100,000 to Aadhaar number/mobile number/virtual address (without IFSC code) across multiple banks.
- Launch of the Bharat Interface for Money (BHIM) app, allows UPI account to non UPI account transfers via QR code. This is expected to bring digital solutions to masses in cost effective ways. Payments can be made without using mobiles,

simply via fingerprints and Aadhaar number. Compatibility with a 2G platform extends access of digital payments to a wide user base and allows the BHIM app to achieve its potential by invigorating our population.

- Emergence of fintech in challenging traditional models such as alternate lending, mobile wallets, etc.

Focus on NPA Management

- Recent Asset Quality Review exercise, conducted by the RBI
- INDRADANUSH for revamping of public sector banks
- Consolidation of public sector banks
- Legal framework has been strengthened and INR 100,000 million has been set aside to re-capitalize banks to deal with stressed assets⁵²
- Government has enhanced/liberalized FDI in asset reconstruction companies (ARCs) to 100%

- The Parliamentary Standing Committee on Finance (SCF), released a report on better tackle NPAs with suggestions on merging banks having higher NPAs with other banks, RBI to play a larger role in managing NPAs via follow through with Banks and improve credit approval process of Banks, Facilitating recovery of NPAs including restructuring of loans in a manner so as to preserve the economic value of assets, Making names of willful defaulters public.
- New Insolvency and Bankruptcy Code, 2016 (the Code) for faster resolution of insolvency cases including strengthening of debt tribunals.
- Affordable Housing has been reclassified as infrastructure. So far, Banks have been the primary source of funding for the infrastructure sector. With the Infrastructure status, developers can access foreign funds at a cheaper cost by way of debt and will be a priority lending for banks as well.

- Expected to allow timely resolution of stressed assets, and allow refinancing of assets. By cleaning the existing balance sheets of Banks, room will be created for fresh credit, which is an imperative for a bank-dependent, growing economy such as India.

Potential for global expansion

India is among the top ten investment destinations globally and the Services sector, the most attractive for these investments. FDI equity inflow has been increasing within the BFSI subsector (of the services sector) over the years, and improved relations with the top investing countries can strengthen domestic capital in this sub-sector.

Recent deals also suggest increased interest from new geographies such as Canada and Japan. In addition, inward investments from Multi-lateral institutions/ Sovereign Wealth Funds (SWFs) in the BFSI space are bringing financial services to the under-served. Some distress funds are also showing interest in the bad-loan portfolios of banks.

Table 1: Top 5 countries for inward investments

Country	2014-15 (April-March), \$ Mn ⁵³	2015-16 (April-March), \$ Mn ⁵⁴	2016-17 (April 16- December 16), \$ Mn ⁵⁵	Cumulative inflows from all sectors (April 00- December 16), \$ Mn ⁵⁶	Current State (% of cumulative 16 year FDI inflow from all sectors) ⁵⁷	2000-15 (Jan-Dec), Service Sector*, \$ Mn ⁵⁸	2000-15 (Jan-Dec), BFSI Sub Sector**, \$ Mn	For improved relations
Mauritius	9,030	8,355	12,819	108,729	34%	18,921	10,418	Further liberalization of FDI policy is under consideration – Will result in ease of doing business in India
Singapore	6,742	13,692	7,115	52,994	16%	9,141	5,033	
US	1,824	4,192	1,940	19,884	6%	3,258	1,794	
UK	1,447	898	1,266	24,374	8%	2,979	1,640	
Netherlands	3,436	2,643	2,500	19,814	6%	2,667	1,468	

Notes:

*Services sector includes Financial, Banking, Insurance, Non-Financial/Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis

** Country specific BFSI nos. are calculated based on the assumption that 55% is the share of BFSI across all countries per 2000-2015 figures

Focus countries/Funds for outward investments

- Capabilities built in India are very relevant across Middle East, South East Asia, and Africa and players from these countries can learn from India's experience.
- The RBI has allowed Indian alternative investment funds (AIFs), to invest abroad, in order to increase the investment opportunities for these funds.
- Indian banks are also looking to tap the global diaspora in other countries.

Future prospects of the industry

According to IMF World Economic Outlook Update (January 2016), the Indian economy is expected to grow around 7%-7.5% during FY 2016-17, despite the uncertainties in the global market.

The launch of new banks is expected to integrate social media, mobility, analytics, cloud and IoT. Digital Wallets, NFC, Blockchain, Social data and analytics, Aadhaar and UID integration in the financial services space. Mobile based Micro-payments are expected to be a growth area in the times to come.

Use of technology to reach bottom of pyramid is expected to result in an even larger impact on the financial landscape of the country, from the last round of the licenses in 1994 and 2002, and may prove to be a game changer for the entire ecosystem, benefitting customers, players and the regulator.

A host of innovative partnerships are expected to emerge between these new players and traditional financial services/ non-financial services players across channels of delivery, third party products, customer facing capabilities, etc.

Regulatory initiatives towards rationalizing NPAs, in the last year included, standard asset categorization, joint lending forums, strategic debt restructuring, forensic reviews, and early warning systems. In an effort to reduce NPAs, the Parliamentary Standing Committee on Finance (SCF), submitted its report on NPAs of Financial

Institutions in February 2016. One pertinent recommendation was the Revival of Development Financial Institutions for financing of long term projects including infrastructure projects.⁵⁹ These measures are expected to rationalize credit risk and reduce NPAs.

GICs will need to align to new expectations on their operating model. GIC industry is witnessing fundamental shifts in the operating structure, driven by higher expectations from onshore.

Conclusion and recommendations

Indian Financial services market is growing at a rapid pace, fueled by both demand side as well as supply side factors. As the entire ecosystem is growing to serve the diverse financial needs of a large population, which so far did not have access to basic financial services, it is throwing opportunities for all stakeholders to participate in this growth. Players across the entire value chain are experiencing these tailwinds, and this has attracted foreign investors, established business groups, Fintechs and alike to financial services. Increasing and strengthening domestic capital in the BFSI sub-sector, is leading to banking sector stability and economic growth in the country.

As governments, regulatory bodies, technology providers, banks, and insurers join hands to serve the needs of the population, India is expected to see an exponential growth in this space, overcoming the hurdles of access, availability and affordability.



4. Healthcare Services

Industry profile



The overall healthcare landscape spans across products—namely pharmaceuticals, medical consumables, medical equipment and devices, and services—namely delivery of healthcare through diagnostics and treatment.

Healthcare delivery essentially covers the services provided to consumers (patients in this case) through the entire lifecycle—preventive (also referred to as ‘wellness’), curative (diagnostics, primary care, secondary care, and tertiary care provided at hospitals or health centers, for both chronic and acute health issues, and recuperative (home healthcare including nutrition, physiotherapy, post-op care).

The healthcare revenue globally was \$7 trillion in 2015⁶⁰, and it is \$110 billion in India in 2016, and is expected to grow to \$280 billion by 2020. Indian healthcare sector became the fifth largest employer, both in terms of direct as well as indirect

employment with total direct employment of 4.7 million people in 2015⁶¹. Healthcare delivery constitutes 65% of the overall Indian healthcare market.

India’s healthcare delivery landscape has historically been dominated by government hospitals, one-off hospitals or nursing homes (owned and run either by charitable trusts, or self-owned by doctor-promoters). It is only in the last two decades that India has seen a surge of large healthcare players, often corporate houses, enter the healthcare delivery space and setup large, tertiary/quaternary care hospitals which compare with world class hospitals in other parts of the globe. Overall, the healthcare delivery market still remains very fragmented, with the 5 largest hospital players together covering around 35,000 beds, which is 1% of the total hospital beds in India⁶². Over 85% of the hospital beds in India are present in facilities with less than 25 beds.

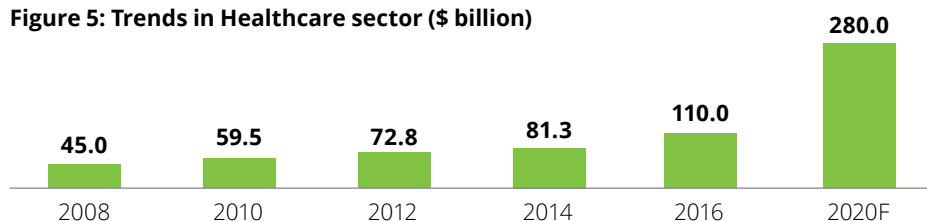
Growth drivers for the industry

There are several factors, on both demand as well as supply side that are acting as catalysts for this industry.

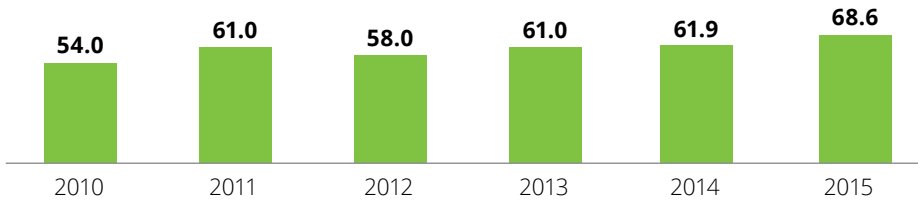
Demand side

- **Large, ageing population-** Increasing life expectancy is causing an ever-increasing population of aged people. Elderly population, currently classified as those aged 80 and over are set to rise from the current 98.9 million to about 168 million by 2026⁶³.
- **High incidence of non-communicable diseases,** such as obesity, diabetes, cardiovascular, chronic obstructive pulmonary disease (COPD), etc. on the back of
 - Sedentary lifestyle (lack of physical exercise), increased stress
 - Poor dietary habits (junk food)
 - Pollution
- Increase in **disposable income**, aiding affordability of healthcare services. During 2015-19, per capita income is expected to increase at a CAGR of 8.09%⁶⁴.
- **Awareness** leading to focus on diagnostics, preventive health checkups. Led by access to internet, and other media such as television and radio.

Figure 5: Trends in Healthcare sector (\$ billion)



Source: IBEF

Figure 6: Per-capita healthcare expenditure (\$)

Source: IBEF

- **Medical Value Travel** – Increase in foreign citizens traveling to India to avail medical services. Presence of world-class hospitals and skilled medical professionals has strengthened India's position as a preferred destination for medical tourism. Treatment for major surgeries in India costs only a fraction—as low as 10% in some cases—of that in developed countries⁶⁵.

Supply side

- **Availability of capital:** Keen interest among investors (Indian and foreign) in Indian healthcare market, leading to entry of more and more players.
- **Different business models** being tried – e.g., the rising popularity of single-specialty clinics, day-care centers, etc.
- **Rising interest of corporate houses** to enter the healthcare space, which was hitherto considered a social service, and hence many of the corporate houses have entered the healthcare arena.
- **Innovations** in medical technology making it possible for more and more people/conditions to be treated.

Government initiatives

Many government initiatives are directly benefitting the healthcare sector.

- **Skill India** – The Healthcare Sector Skill Council (HSSC) has been set up to aid skilling and vocational training for healthcare industry and its growing need for human resources. This is expected to provide a new talent pool to the industry to fuel its growth.
- **Make in India** – promoting manufacturing of medical equipment, devices, consumables and drugs in India. Not only will this create an entire ecosystem and

jobs for many in the life sciences and medical technology space, it will reduce the cost of these devices, which were so far imported (with the associated import duties). This cost reduction will play its way down the chain and reduce the healthcare costs for the end consumers, strengthening the lever of affordability.

- **Digital India** – a push for use of digital technologies has also positively impacted healthcare sector. Digital money (cards, e-wallets, UPI, etc.) has opened up various payment options for patients to pay for healthcare services.
- **Start-up India** – With tax incentives to startups and incubation support under this initiative, the wave of healthcare-based startups remains strong, covering aspects such as diagnostics, fitness and wellness, aggregation of health providers, electronic medical records, video/remote consultations, second opinion consultations, etc.
- **Public-Private Partnership (PPP)** – Government has initiated partnerships with private players to deliver healthcare services in a few specific areas. For example, O&M of a few hospitals, running medical ambulance services, running healthcare-related helplines, etc. While the government can act as the payer, the execution and delivery of services may be provided by private players who are experts in the field. In turn, the government would need to hold the players accountable by measuring them against pre-decided and pre-agreed service standards (SLAs). But the nation is yet to fully leverage the PPP model to deliver healthcare services to the population at large. The PPP model will require both the government and private players to come forward and structure

the initiatives around a common ground where their mutual social and economic aspirations can be met.

Potential for global expansion

India is however rapidly becoming an important hub for medical treatment among the under-developed and developing markets with its growing share of best in class corporate hospitals, and sees a large number of foreign nationals availing of health services in India. The medical tourism in India is currently \$3.9 billion in 2016, and is expected to touch \$8 billion by 2020, having grown at a CAGR of 27% over 2013-16⁶⁶. Majority of the patients coming to India for treatment are from the Middle East, Africa, Bangladesh, Afghanistan, Maldives, Pakistan, Bhutan and Sri Lanka. India's cost advantage will significantly open doors to US and Europe over future, due to lower cost than the US and almost half that of Europe. There is also a growing demand for Indian medical talent and know-how in geographies that are lacking in advanced medical infrastructure, and several players in African countries are approaching Indian players to help them set up and run hospitals, both as advisors as well as O&M partners. This is adding to the 'exports' bucket.

Future prospects for the industry

Going forward, healthcare in India will witness further strengthening of the growth drivers.

- **Talent**
 - There is a surge in the number of medical education institutes. Private institutes are coming up all over the country, which are expected to supply the skilled workforce that will power the healthcare institutions of the future.
 - Task shifting will multiply the resources available for each task – the industry is expected to figure out the right education/skill level for performing each task.
- **Medical insurance penetration**
 - As the medical insurance market matures in India, not only will the penetration increase, there will be innovation in the products too. For instance, cover for out-patient services,

cover for senior citizens. These will further propel demand for and affordability of healthcare services.

- Rise in health insurance penetration
 - According to the latest National Sample Survey data, with Centre-run Rashtriya Swasthya Bima Yojana (RSBY), insurance coverage has improved over the years, but still only 12% of the urban and 13% of the rural population had access to insurance cover⁶⁷.
- The IRDA has introduced the concept of transferring the current insurer to another without losing out on any benefits. This regulation will also allow a consumer to port from one retail plan to another retail plan; applicable to both individual and family floater policies. This concept is yet to gain momentum, once done it has the potential to change the landscape of health insurance in India.

- **Tele-medicine**

- The problem of access will be solved to a large extent through the use of modalities such as telemedicine, tele-radiology, e-ICU. As the broadband quality increases in the interiors of the country, through the deepening network of fiber optics across the length and breadth of the country (National Fibre Optic Network), this will be a reality, and will give the rural population access to services that were hitherto limited to only those in urban centers, such as access to specialists and super-specialists.

- **Technological advancement and innovation**

- M-Health: This will create new opportunities and business models. The use of mobiles for accessing health-related information or consuming health services will be a reality, coupled with wearables for tracking health metrics.
- Data Analytics: Electronic medical records (EMR) will open up a new trend of data analytics for predictive analysis.

- **Medical Value Travel**

- As Indian healthcare industry is able to establish its quality through clinical outcomes data published in credible health registries (such as by ICHOM – International Consortium for Health Outcomes Measurement), the insurance payers of developed countries will start working with Indian health facilities, attracted by the dual value of low-cost and high-quality. This will open up a completely new market to serve.

- **e-Health**

- The government initiative under e-health aims to provide effective and economical healthcare services to all citizens by making use of technology and portals. It will facilitate citizens to maintain health records and book online appointments with various departments of different hospitals using eKYC and Aadhaar number.

- **Dental tourism**

- Dental tourism accounts for 10% of the medical tourism and the government is keen to promote it. India provides competitive cost advantage at one-tenth of the cost of the US and Europe.

Conclusion and recommendations

Healthcare services in India are growing at a rapid pace, fueled by both demand side factors as well as supply side. As the entire ecosystem is growing to serve the health needs of a large, aware and demanding population, it is throwing opportunities for all stakeholders to participate in this growth. Players across the entire value chain are experiencing these tailwinds, and this has attracted investors, innovators, startups and established business groups alike to healthcare.

As governments, regulatory bodies, educational institutions, technology innovators and core providers join hands to serve the needs of the domestic and international population, India will see an exponential growth in this space, overcoming the hurdles of access, availability and affordability.





Favorable policies of government to support the industry like Software Technology Parks of India (STPI), special economic zone (SEZ), The New Telecom Policy (NTP 1999) and IT Act 2000 over the years, and other support infrastructures

A preferred destination for IT & ITeS in the world; continues to be a leader in the global sourcing industry with 55% market share

The IT and ITeS sector employs 3.7 million people and it is the 4th largest urban women employer.

IT & ITeS companies attracted 45% share of the total investments which is almost \$7.5 billion (across 396 deals).

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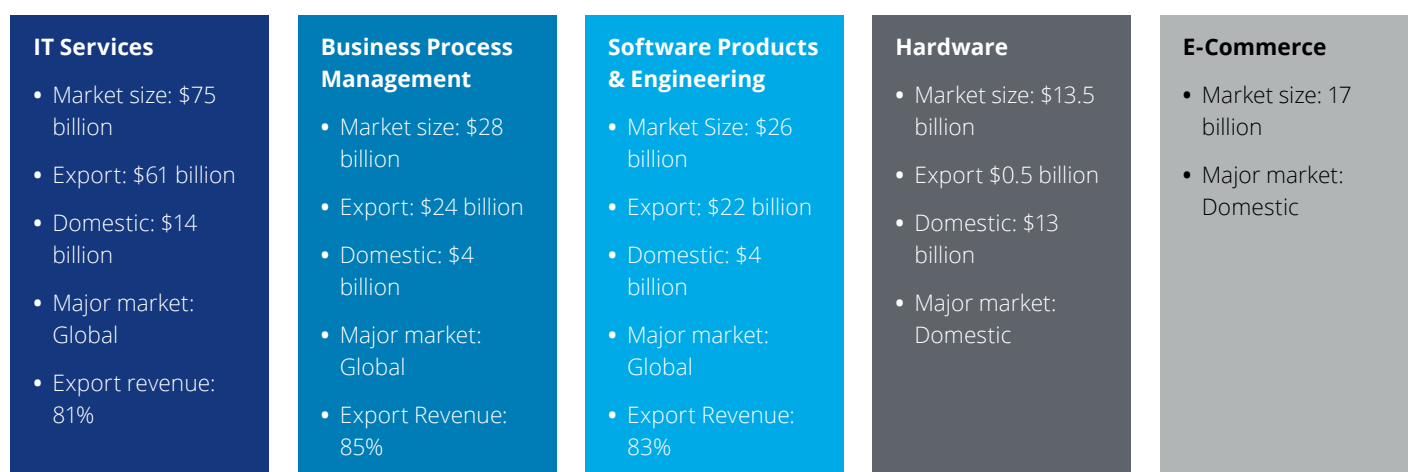
helped establish India's leadership position in the global technology sourcing market and in the process, catalyzed the growth of services sector in India across education, healthcare, tourism, financial services, transportation, hospitality, and other services. IT services industry ecosystem has played a part in helping India leap frog from an agriculture driven economy to a services driven economy.

On the demographic front, the industry also helped create a generation of technology savvy population, comfortable with using technology enabled tools in day to day life. Taken together with the contemporaneous advancements in telecommunication networks, services, and the smartphone penetration, this convergence of technology, telecom, and content perfectly set the stage for the next wave of technology enabled business such as e-commerce and consumer internet industries in India, and also provided

a means to enable public governance and citizen services through technology enabled interfaces. Investments in creating such public technology infrastructures such as Digital India, Skill India, Make in India leveraging the industry's talent ecosystem along with the industry's adaptability to emerging technologies like machine learning, artificial intelligence, automation, block chain, virtual reality, etc. will broadly define the narrative for this industry in the coming decades.

Market segments

Figure 8: Market segments

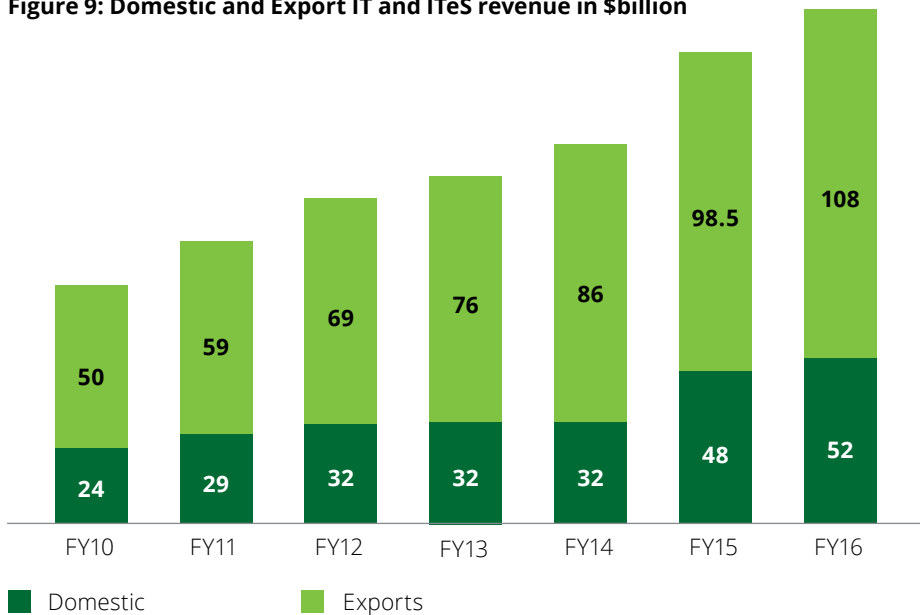


Source: ITSR 2016, NASSCOM and Deloitte Analysis

The IT –BPM sector generated revenue of \$143 billion in 2016 with exports of \$108 billion and the domestic contribution was \$35 billion⁶⁸. The domestic IT-ITeS market is \$52 billion which includes \$17 billion e-Commerce sector along with domestic IT sector revenue⁶⁹. Notwithstanding the current global headwinds and changing geo-political discourse on globalization, the sector has good prospects in the medium-long term, and is expected

to touch \$1 trillion by 2023 driven by domestic and global growth⁷⁰. The GDP contribution has changed dramatically in the last two decades and currently the sector contributes 9.5% to the Indian GDP (FY15) in comparison to 1.2% in FY98⁷¹ and also plays a significant role in generating employment for almost 3.7 million people⁷². The sector comprises of 4 major sub segments and majority of the revenue comes from export. The export market is

growing at a CAGR 13.5%⁷³. North America is the major destination for IT exports and generates 60% of the export revenue. Europe contributes 25% of export revenue out of which almost 50% comes from UK. Dollar is the invoice currency constituting 75% of the exports followed by pound and euro⁷⁴. There is significant growth in the domestic market since FY14 driven by government initiatives like Digital India, Smart City etc.

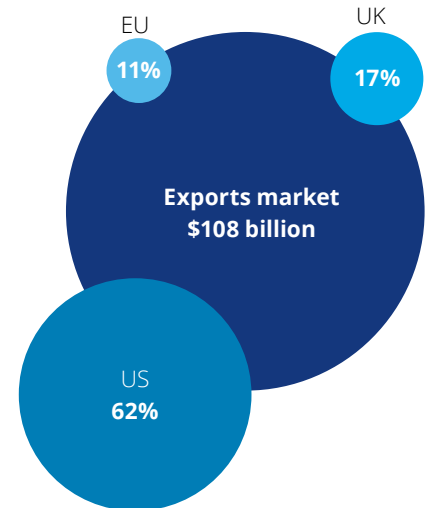
Figure 9: Domestic and Export IT and ITes revenue in \$billion

Source: NASSCOM

Competitive profile

Indian vendors face competition from both large global service providers as well as niche firms and startups in frontier technologies. Latin America and Eastern European countries traditionally competed with India for near-shore and offshore delivery infrastructure, and most large vendors from India have established

delivery presence in these locations to cater to the near shore market. In the current environment countries like Philippines, Vietnam, Malaysia, and Indonesia are also emerging as potential destination for delivering cost effective IT/BPO services.

Figure 10 Major IT exports market**Government initiatives**

Digital India: Indian IT services sector can support and have a major role to play in the eGovernance and eKranti pillars of Digital India, drawing on talent and the experience in supporting digital transformation projects in the western markets.

Figure 11: Digital India IT Initiatives

Source: Digital India

Make in India: India's Engineering R&D services sector, which is among the fastest growing sub sectors within the IT/BPM ecosystem, can benefit from the policies and support infrastructure provided by Make in India initiative to establish India's leadership position in the global R&D services market. Global market for ER&D services is traditionally dominated by service providers from France and Germany, who have built their capabilities by leveraging the local manufacturing and industrial ecosystem in European markets. In recent years, service providers from India have emerged as preferred partners for global R&D services sourcing, and a few major service providers from India are among the Top 10 vendors in the global ER&D services market⁷⁵. Taken together with Global In house Centers (GICs) of MNCs across industries, India is fast emerging as a regional and

global powerhouse in ER&D services. By leveraging the emerging manufacturing and industrial ecosystem enabled by Make in India initiative, India has the potential to become the global leader in Engineering R&D.

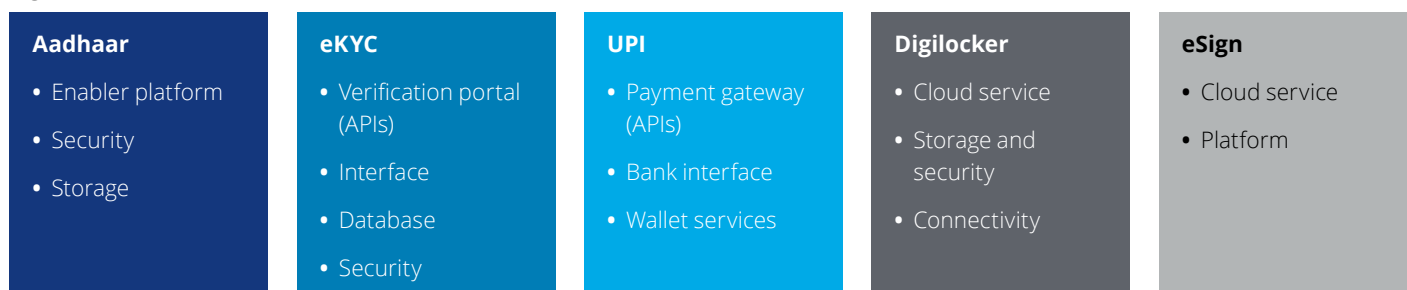
Skill India: The Skill India initiative has 249 Training Partners, 3,222 Training Centers across India. People can search for training partner and course, access e-content, provide feedback, and locate the nearest CSC and post innovative ideas. It provides vocational training and certifications to students to make them eligible for employment. This initiative is a big boost for the IT services sector which requires more skilled human resources.

Mapping IT services to India Stack: India stack is the innovation around digital services in India for efficient service

delivery by providing Aadhaar-based verification, paperless e-KYC, cashless transaction, secure storage of digital documents, and electronic signature of documents⁷⁶.

- **Presence less layer:** Where a universal biometric digital identity allows people to participate in any service from anywhere in the country
- **Paperless layer:** Where digital records move with an individual's digital identity, eliminating the need for massive amount of paper collection and storage
- **Cashless layer:** Where a single interface to all the country's bank accounts and wallets to democratize payments
- **Consent layer:** Allows data to move freely and securely to democratize the market for data

Figure 12: API's for India



Source: IndiaStack

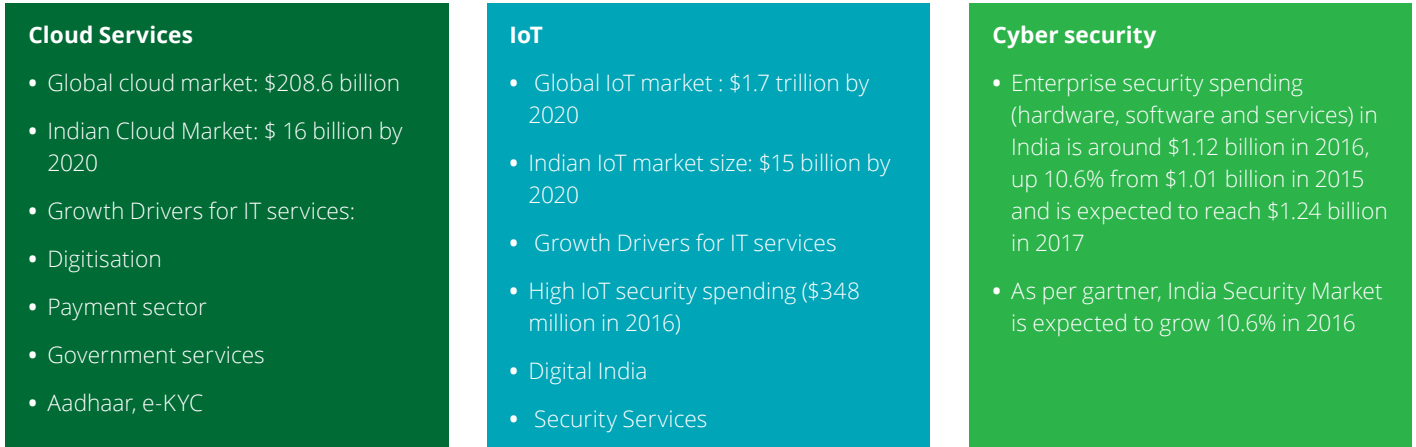
Future prospects for the industry

India's structural advantages such as large pool of cost effective STEM talent (science, technology, engineering, and mathematics), high quality research institutions, MNC R&D centers, rising smartphone and internet penetration, along with public sector investments in digital economy initiatives in India, would enable the industry to address domestic and global opportunities in digital transformation, along with emerging opportunities in frontier technologies.

ER&D services: At \$26 billion, ER&D and product development services is among the fastest growing sub segments within the larger IT-BPM industry, employing close to 477,000 people and a 28% market share in the global sourcing market. This sector is expected to reach \$35 billion to \$40 billion revenue by 2020⁷⁷ supported by the emerging trends in core engineering verticals like Industry 4.0, automation, hybrid vehicles, autonomous driving, robotics, 3D printing, IoT, and machine data analytics. After Europe, India is the second largest sourcing location for global ER&D services, and by leveraging the favorable

policies and support infrastructure envisioned under Make in India initiative, India can emerge as a global leader in R&D and product development services industry.

Digital transformation: Increasing adoption of digital technologies like cloud, mobility, and IoT across industries and the requirement for robust cyber security infrastructure provides an interesting growth opportunity for the service providers as the demand for traditional services becomes stagnant.

Figure 13: Potential Markets

Source: NASSCOM, Gartner, IDC, Deloitte Analysis

Some of the key trends driving digital disruption across industry segments are below:

- **Banking and Financial Services** – increasing investments in digital banking and fin-tech solutions as India moves towards cash less economy
- **Telecom** – Integration of data and content ecosystem, enabled by high speed connectivity through 4G/5G technologies
- **Manufacturing** – digital manufacturing, automation, Industry 4.0
- **Retail** – E-commerce and consumer internet products from startups
- **Healthcare** – Digitization of health records, Tele medicine

Domestic and other emerging markets: The domestic market in India has a high potential of growth driven by digital economy initiatives of the government, along with digitisation and automation. The digital transformation drive by the government such as Digital India, Skill India, e-KYC, JAM Trinity etc., creates huge demand for IT and ITeS services in the country and provides new opportunity for the vendors.

Potential for global expansion⁷⁸

In addition to the domestic market in India, APAC is a large and underpenetrated market for Indian IT vendors that could provide the next phase of growth amidst geo political headwinds in the western markets. Japan and China are among the largest technology spenders in APAC region, an opportunity that could be profitably addressed by Indian technology vendors leveraging their decades of expertise in delivering complex transformational projects for western markets.

- **Japan** – at \$248 billion in 2017, Japan is the largest market for technology goods and services in APAC region. In Japan's mature market for technology the next phase of growth could come from operational technologies like IoT, machine data analytics, and automation as businesses tend to focus on operational improvements to enhance productivity. –These are the areas where Indian IT vendors have made significant investments in the recent years and are in a better position to address
- **China** – The second largest market for technology goods and services in APAC region, after Japan. Traditionally a major market for telecom and hardware equipment, the recent successes of digital native companies like Alibaba,

Baidu, and Tencent could herald the next phase of digital adoption among traditional enterprises thereby driving the growth of technology services in this market.

- **Australia** – Software, technology outsourcing, and consulting are expected to be among the major areas of investments in Australia⁷⁹ and Indian vendors are well positioned to capture the emerging opportunities in these segments, taking advantage of their capabilities in consulting and digital technologies.
- **ASEAN countries** – countries like Thailand, Indonesia, Malaysia, Philippines, Vietnam, and Singapore collectively account for a sizable market for technology goods and services, and are among the fastest growing markets for technology in APAC region. Largely hardware and telecom equipment driven, spending on software is expected to raise by 9% and outsourcing by 12% in 2017⁸⁰. These markets are also being explored as alternative destinations for setting up ITeS services like business process management on account of the availability of cost effective talent. ASEAN markets can be explored by Indian IT vendors for both talent, as well as market opportunities.

Conclusion and recommendations

Investments in frontier technology:

Increasing investment focus in emerging technologies such as Artificial Intelligence, Machine Learning, Automation, reducing dependence on traditional services, and strategic investments in global markets through a mix of local hiring and M&A would help Indian technology vendors address emerging opportunities.

Incentives for domestic R&D Increasing incentives for creating products and intellectual property in emerging technology areas will help Indian companies provide cost effective solutions for the global B2B technology market, which is currently dominated by the US and European vendors.

Ease of doing business in India:

Simplifying technology procurement processes and program management for government procurement would provide a major boost to the industry and help vendors profitably address emerging digital economy opportunities in India.

As the technology outsourcing market matures, Indian IT Services industry is going through a transformation, to IT Services 2.0. While phase one was about decades of double digit growth at high margins leveraging global delivery model through cost effective platform, phase two will see Indian vendors help global enterprises in their strategic business transformation through digital services using an optimized delivery infrastructure, and also profitably address digital economy initiatives in India helping bring technology for billion plus people. IT Services 2.0 has the potential for Indian Industry to redefine and shape global technology market, and also catalyze the domestic economic growth across sectors. The policies we envision today should help the industry achieve this transformation in a sustainable manner.



6. Next Gen Cities

Industry profile



Rapid urbanization in India has led to increased pressure on existing municipal infrastructure like energy, water supply & distribution, sewerage, transportation, energy consumption and other urban amenities. It is expected that nearly 600 million (40%)⁸¹ population will be residing in Indian urban areas by 2035. This has steered the Government of India (GOI) to undertake a number of measures, aiming to transform Indian cities through urban renewal and technology infusion catapulting them among the global Next Gen Cities, the most important of which is the flagship Smart Cities Mission (SCM).

In April, 2015 the GoI approved the Smart City Mission to develop 100 smart cities across the country with an outlay of INR 480 billion over a period of five years. Subsequently, the Prime Minister of India launched the Smart City Mission on 25th June, 2015 with the Ministry of Urban Development (MoUD), GoI as the nodal agency for creating these Next Gen Cities.

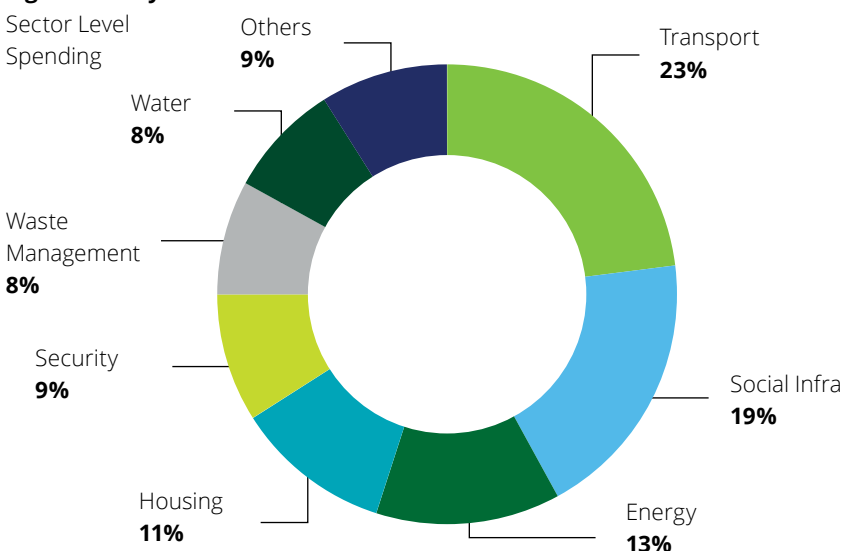
The Smart Cities Mission is an innovative initiative by GoI to drive economic growth and improve the quality of life of people by enabling local development and harnessing technology as a means to create smart outcomes for citizens. Since the launch of Mission in 2015 about 60 cities have so

far been qualified for the implementation phase of the Mission. These 60 cities are likely to spend INR 1450+ billion (\$22 billion) over the next five years for implementing Smart City Plans. The envisaged investment from 100 cities is estimated at INR 2500+ billion (\$40 billion).

Role of ICT Industry as key services sector

Based on the Smart City proposals received so far, approximately, 30% of the investments proposed under the smart city mission is envisaged in ICT, one of the key service sectors in the country. The key sectors of this investment is presented in the diagram below⁸²:

Figure 14: Key sectors for investment under SCM



Transport

- Smart Cards (for multi-modal use)
- Smart traffic management system

Social Infra

- Telemedicine for urban poor
- Smart Classrooms

Energy

- Smart metering
- Energy efficient smart street lighting

Security

- CCTV network
- Command and control centre

Waste Management

- Smart bin management
- Real time fleet management

Water

- Piping network management system
- Automated remote metering

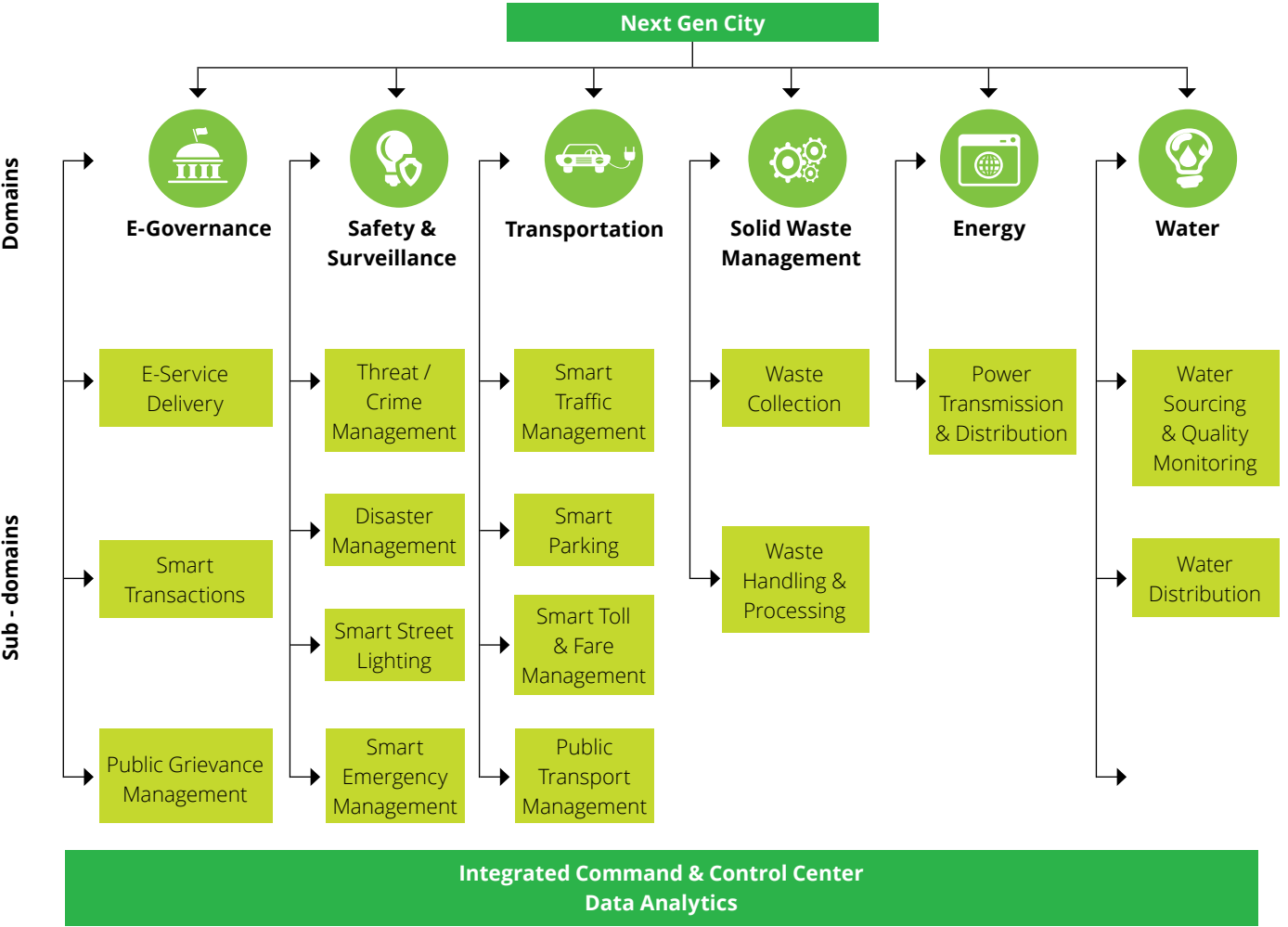
Source: Smart Cities Mission, Ministry of Urban Development, Govt. of India and Deloitte Analysis

The role of ICT in the Smart City Plan is essentially an amalgamation of hard infrastructure (Physical infrastructure and social infrastructure) and Information Technology based innovative solutions, i.e., design, development and management of hard infrastructure like utilities and

services (energy, water, sewerage, solid waste management), transportation, education and healthcare services, and soft infrastructure like SCADA system for energy, water and sewerage, Global Positioning System (GPS) based solid waste management, smart parking and Intelligent

Transport System for transportation, Government to citizen services like online information related to public grievances, death and birth, vaccination and school dropouts through citizen information management.

Figure 15: Key ICT Solutions proposed in Smart City Plans



Source: Smart Cities Mission, Ministry of Urban Development, Govt. of India and Deloitte Analysis

Some of the major innovative and smart solutions proposed in these sectors have been presented below:

Intelligent Transport System (ITS): ITS is a broad range of wireless and wired communications-based information and electronics technologies, which when applied to the current transportation system, can help improve safety, reduce congestion, enhance mobility, minimize environmental impacts, save energy, and promote economic productivity. It is a cost-effective strategy that further enhances the Bus Rapid Transit (BRT) experience. ITS is the application of advanced communications and technologies to transportation systems providing advanced monitoring, control and traveler information capabilities that allow better real-time management of roads and transit systems. The major components of ITS is presented in the figure alongside.

ICT based Energy Efficient Lighting:

As a part of Smart Networking Concept for rationalizing maximum usage of LED lights which would in turn positively impact the energy savings and electricity consumption bills, the concept of sensor based monitoring of city lighting system has been introduced. Centralized Control Monitoring System (CCMS) will comprise of a wide variety of sensors, including IR, ultrasonic, light, illumination, voice, and Hall sensors, which can be integrated into a microcontroller unit-based LED lighting system helping in detection and processing of various types of signals for energy efficient operation of the LED lighting system.

Solid Waste Management through Innovative Technologies:

Geo-coded and sensor tagged waste collection bins to relay key information like location of containers, time and date of collection, status (lifted or not lifted), weight, etc. GPS tracking system will enable real-time monitoring of collection fleet, on-time waste pick-up and efficient route allocation. Further, challenges related to improper waste disposal can be mitigated through sensor based sorting system for separating waste particles resulting in high recovery & purity rates.

Figure 16: Components of ITS



Source: Deloitte Analysis

Future prospects for the industry

Digitization irrespective of the sector will be the key element for next gen economic growth for any spatial region. However, when it comes Smart Cities the key driver is investment in urban infrastructure and working towards introducing smart solutions. Some of the key future smart solution prospects with a combination of improved urban infrastructure and ICT are discussed below:

Smart Villages: A Smart Village aims to provide sustainable and inclusive development to all sections of its community, ensuring a high standard of living. It focuses on empowering local self-governance, providing access to assured basic amenities and responsible individual and community behavior to build a vibrant society with partnership from individuals, NRIs, elected representatives, corporates and business houses, NGOs, philanthropists, etc.

Smart Railway Stations: A smart railway station is essentially a redevelopment project encompassing easy access to stations, improved passenger amenities, integrated public transport hub, waiting halls and other amenities for passengers, development of residential & commercial spaces, landscaping etc.

Smart Campuses: A Smart Campus solution is a software application integrated with innovative technologies like Smart card, Biometrics, Barcode, and Interactive Voice Response System (IVRS). It comprises of a set of modules which help in application & admission, administration, student services, staff services, examination, library management, fee management, student profile and Management Information System (MIS) dashboard.

Conclusion and recommendations

Once, Smart City based infrastructure is developed to a certain level in the 100 cities, the next step would be to explore the potential towards developing intercity networks and creation of smart regions including smaller towns (smart towns/ regions) and rural areas (smart villages), thereby increasing the user base for the provisioned infrastructure, profiting through economies of scale. The crucial factors that will play a pivotal role in the next generation of city reforms will include:

- Cities/States to develop enabling policies for creating an improved eco-system for implementing smart solutions in city context.
- Development of innovative financial models/monetization models for funding both Cap-Ex and Opex.
- Innovative ICT based solutions including cloud hosted solutions for improving urban governance and service delivery can be packaged in the form of mobile applications and can be made available for a cluster of cities with real time updates ensuring better urban services, increased economic growth and improved quality of life.
- Capacity building of the city administration for ensuring long term sustainability.



7. Start-ups / SME in Services

Industry profile



Micro, Small and Medium Enterprises (MSMEs) have been the engines of India's development for several decades, making significant contributions towards economic growth and job creation. There are around 51.1 million MSME units across India out of which about 55.3% are based in semi urban and rural areas providing a distributed development model in a large and diverse country. The sector represents 38% of the country's GDP (out of which 8% comes from manufacturing while 30% comes from services⁸³), contributes 40% of the total exports, 45% of the overall manufacturing output and employs around 100 million people⁸⁴. The sector traditionally faced challenges in adequate and timely access to risk capital, non-availability of skilled labor and technology, ineffective marketing and distribution networks, and stringent regulations and compliance requirements that made it difficult for SMEs to leapfrog into the big league.

SME to Start-ups – the transition enabled by technology and access to risk capital

In the past decade, as information technology industry grew at a rapid pace across the world transforming business processes and creating efficient value chains through seamless information exchange. India also capitalized on this opportunity through the home grown

IT/ITeS industry. This industry created a robust ecosystem of Science, Technology, Engineering and Mathematics (STEM) talent in India, and also a new demography of consumers comfortable in using technology enabled interfaces for day to day business transactions. Supported by contemporaneous advancements in mobile phone and internet penetration, the market was ready for new services and innovative business models that used technology for disrupting traditional industries and value chains to provide superior value to the consumers. The early successes of such services in e-commerce and consumer internet sector generated interest among global investors on the larger potential of such services. Taken together, technology and risk capital started a new wave of SMEs in India enabling the development of what is now widely known as the start-up ecosystem in the country.

Key enablers:

- **Commoditization of consumer technology** – rapid advancements in digital technologies and large scale adoption of digital services like social, mobile, and web based services around the world commoditized the building blocks required to build and operate web scale IT systems.

- **Smartphone and internet penetration** – as of 2016, there are 367 million internet users⁸⁵ and almost 300 million⁸⁶ smartphone users in India. The Internet subscriber base is expected to reach 730 million by 2020⁸⁷ while the total telecom subscriber base will reach 1.4 billion⁸⁸ in the same period. This provides a new platform for companies to reach their customers through mobile first services.

- **Risk capital** - As successful technology platforms enjoy a natural monopoly status in the markets they operate in, there is considerable interest from the investor community to fund such opportunities that uses technology enabled platforms and interfaces for reaching a larger market.

Defining a Start-up

The Start-up India Initiative by government of India has defined start-ups in India. Provided that such entity is not formed by splitting up, or reconstruction, of a business already in existence. Provided also that an entity shall cease to be a start-up if its turnover for the previous financial years has exceeded INR 250 million or it has completed 5 years from the date of incorporation/registration⁸⁹.

- An entity, incorporated in India
- Should not be more than five years old
- With annual turnover not exceeding INR 250 million in any preceding financial year, and
- Working towards innovation, development, deployment or commercialization of new products, processes or services driven by technology or intellectual property

India: fastest growing start-up ecosystem

As of 2016, there are more than 10,000 startups in the country out of which around 4,750 are in the technology sector. The technology based start-up sector is growing by 10-12% Y-o-Y making India the 3rd Largest start-up ecosystem in the world after US and UK. India has added more than 1400 tech start-ups in 2016 with a Y-o-Y growth rate of around 8-10% and employed around 100,000 people in start-ups⁹⁰ and is expected to employ

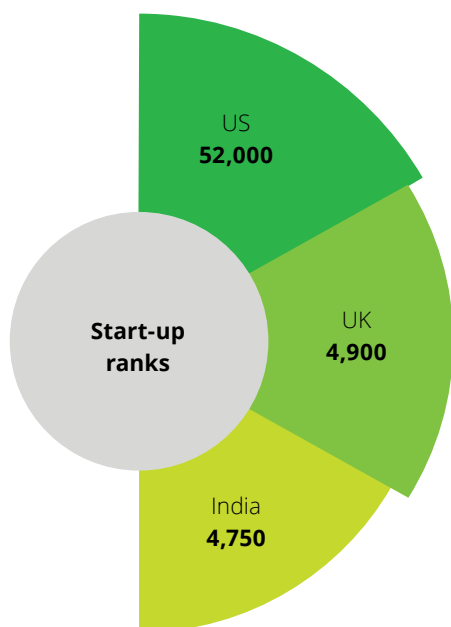
around 2,50,000 people by 2020. The no. of tech start-ups in India is expected to reach 10,500 by 2020. The sector has witnessed 46.5% CAGR growth between 2010 and 2016 in terms of number of start-ups. Average age of start-up founders in India is just 28 years and the sector has 9% female founders.

Emerging geographical clusters:

In addition to the traditional start-up hubs such as Bangalore, Delhi-NCR, Chennai, Mumbai, Hyderabad, and Pune,

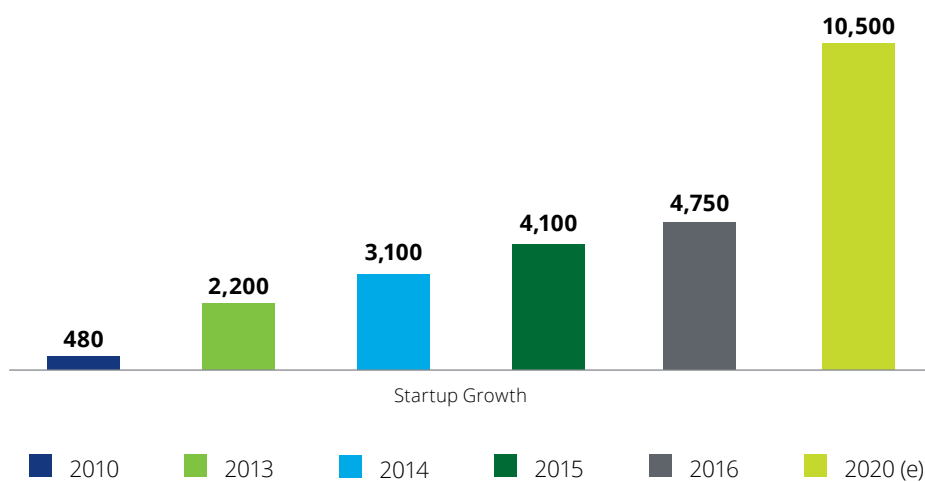
cities such as Kochi, Kolkata and Jaipur are also emerging as important start-up destinations due to low operational costs, cost effective workforce, and efficient local infrastructure. Together Kochi, Kolkata and Jaipur attracted \$350 million in 2016. While there are more than 110 start-ups present in Kochi, Kolkata and Jaipur are the home to almost 125+ start-ups⁹¹.

Figure 17: Top Tech Startup Countries



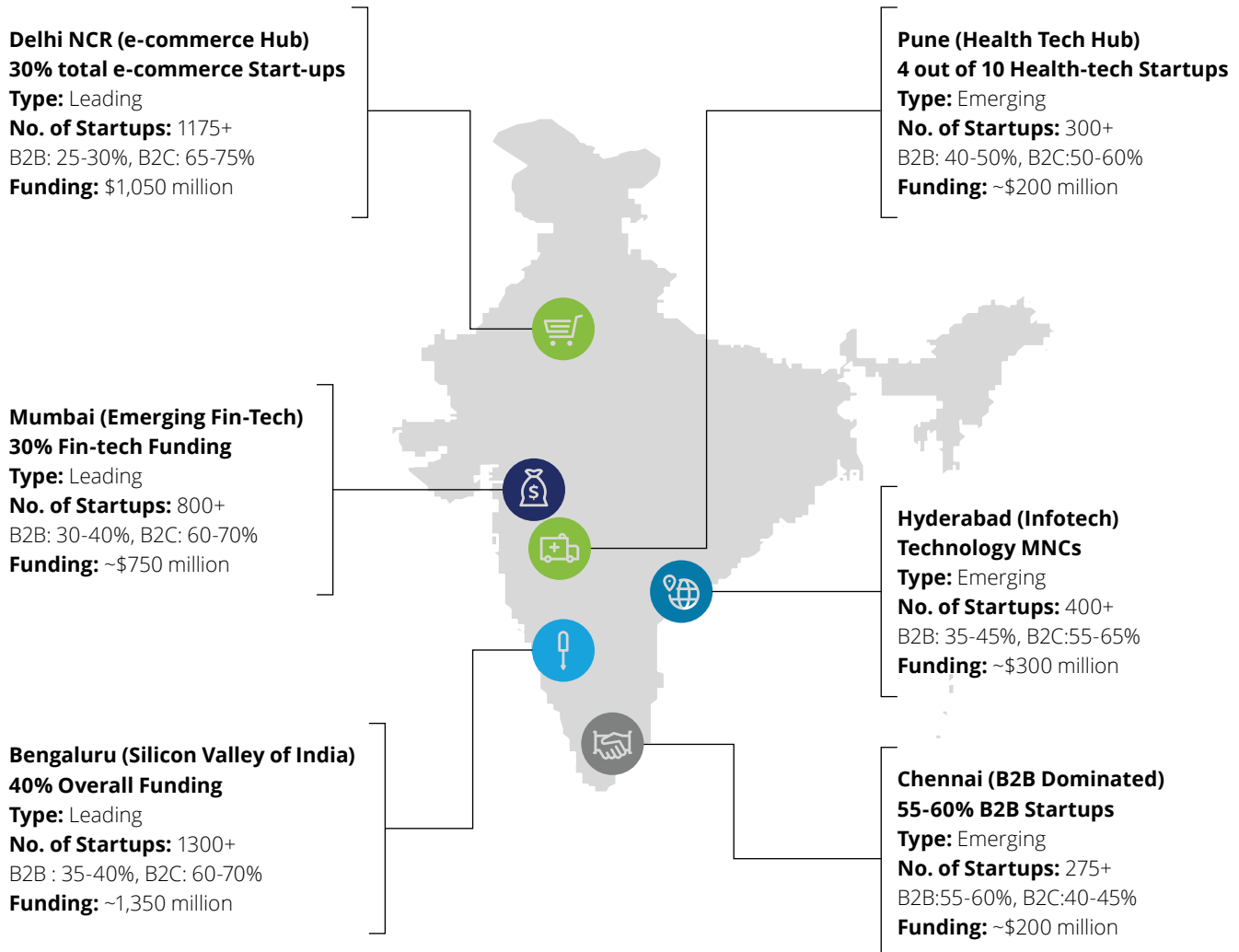
Source: NASSCOM: Indian Startup Ecosystem Maturing

Figure 18: Start-up Growth in India



Source: NASSCOM: Indian Startup Ecosystem Maturing

Figure 19: Geographical Cluster



Source: NASSCOM: Indian Start-up Ecosystem Maturing, Report 2016

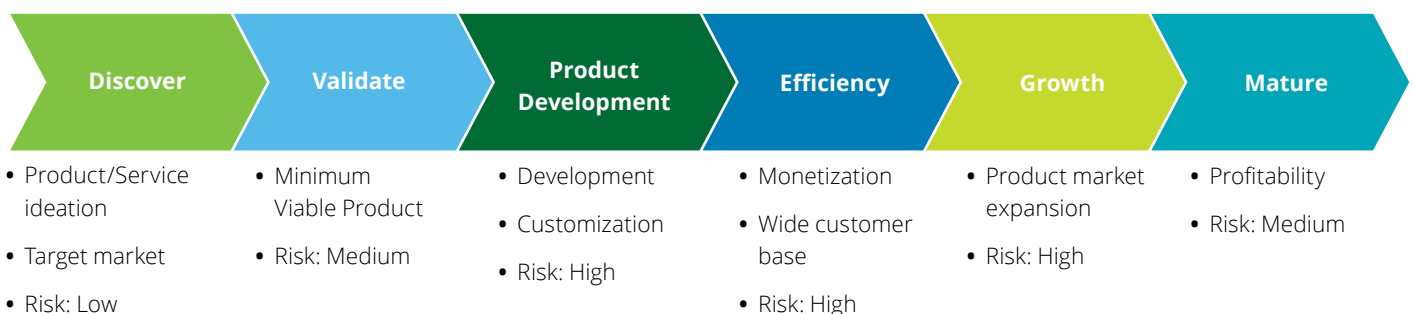
Start-up Lifecycle and Funding

A start-up goes through multiple stages in its life time before it matures and becomes

a bigger brand or is consolidated with a larger entity. The Business risk varies in each stage, and an estimated 70-80% of

the start-ups fail within the initial 5 years due to the risks associated with products and the market.

Figure 20: Lifecycle of Start-up Ecosystem



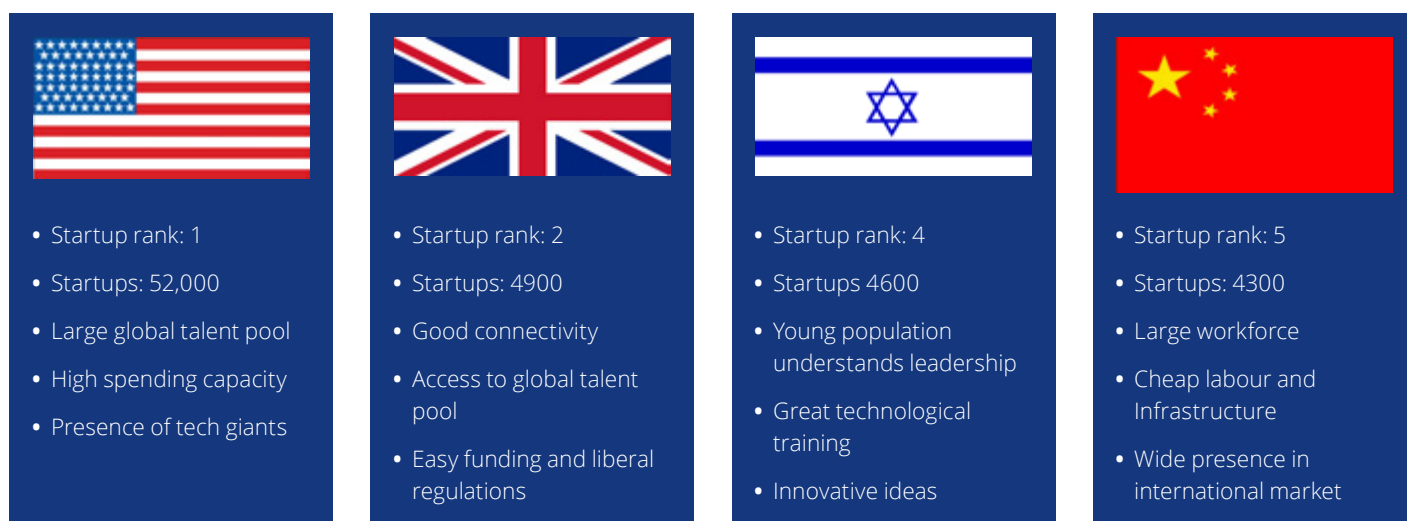
Source: Deloitte Analysis

As start-ups navigate these stages in their growth journey, the requirement for capital and the associated risk-return expectations also vary across these stages. Early stage risk capital is typically provided by founders themselves, angel investors and venture capital investors,

and the capital for the growth stage and late stage is typically provided by Private Equity investors, each having their own return expectations commensurate with the business risks in the respective stage. Indian start-ups managed to generate \$4 billion funding across 1,040 angel and VC/

PE deals between January and December 2016. There is a decrease of around 55% in the start-up funding in comparison to 2015 which managed \$9 billion. Whereas the number of deals has increased by 3% in comparison to 2015⁹².

Figure 21: Global perspective



Source: NASSCOM, Deloitte Analysis

Government initiatives

Digital India: Increasing investments in digital economy initiatives provides opportunities for start-ups in India to provide localized solutions for the larger market.

Key enablers include:

- **NOFN:** The nationwide broadband network which will connect 250,000 Gram Panchayats will be a big boost for start-ups to reach rural population.
- **Aadhaar e-KYC:** The Aadhaar based authentication (e-KYC) provides an easy way to do business with authentication of customers.
- **Cloud Platforms:** accelerating the adoption of as-a-service business models

Skill India: The Skill India initiative could be a good opportunity for the emerging Edutech sector which has more than 180 companies, and managed to attract \$170

million in 2016⁹³. With the Government's plan to impart skill training to 400 million people by 2022⁹⁴, sectors such as eLearning, and eMentoring will be the key enablers of such large scale transformation and start-ups in this space can take advantage of this opportunity to reach a larger market.

Start-up India: Start-up India initiative provides the necessary regulatory and policy support to promote entrepreneurship and support start-ups in their initial years of existence. Key initiatives include

- **Compliance Regime based on Self-Certification:** Objective is to reduce the regulatory burden on start-ups thereby allowing them to focus on their core business and keep compliance cost low.
- **Online portal and mobile application:** Single platform start-ups for interacting with Government and other regulatory

institutions.

- **Innovation and R&D:** A fast-track system for patent examination at lower costs is being conceptualized by the central government.
- **Funding Support and Tax exemption:** Initial corpus of INR 25 billion and a planned corpus of INR 100 billion over a period of 4 years⁹⁵. Start-ups are exempted from income tax for a period of 3 years.
- **Research Parks/Start-up Centers:** Government plans to set up 7 new Research Parks in institutes with an initial investment of INR 1 billion each. It also plans to setup 13 start-up centers and 18 Technology Business Incubators⁹⁶.

Future prospects of the sector

Market opportunity: While the first phase of start-ups focused on the e-commerce and consumer internet sectors targeting the urban population, the next phase

of start-ups are increasingly focusing on providing domain specific solutions for the larger market opportunity across sectors such as agriculture, education, finance, healthcare, and manufacturing. The technology infrastructure envisaged under digital India program such as JAM trinity, Aadhaar enabled payments, UPI interface, etc. along with the private sector initiatives such as 'India stack' are expected to provide the necessary platforms and infrastructure support for these start-ups to build large scale solutions for the core industries.

Innovation and R&D: India has always been a leader in frugal innovation. Our cost structures and purchasing power parity helps us build high end technology at globally competitive costs, as demonstrated in our success in atomic and space research. But compared to our global peers, India lags considerably in institutionalizing R&D, as shown in the number of patent applications filed. India has 45,568 patents in 2015 in comparison to China's 1.1 million patents⁹⁷. By increasing investments in R&D and monetizing it through patents and products, Indian start-ups can profitably address broader opportunities in the global market, at significantly lower costs compared to their global competitors.

Industry collaboration India's large and active entrepreneurship ecosystem can benefit largely from engaging closely with the large and established companies in their respective sectors and across sectors. While start-ups benefit from the talent and market access, large enterprises can gain in niche technical and subject matter expertise along with the ability to address emerging opportunities faster. Though companies in the technology sector are more proactive in engaging with start-ups, companies in traditional sectors should also start exploring such start-up engagements for a mutual success.

Capital though technology start-ups in ecommerce, consumer internet, and enterprise software segments are fairly successful in accessing risk capital, SMEs and start-ups in traditional sectors have

had difficulties in accessing timely funds for capex and working capital requirements at competitive rates. While the government's initiatives to improve this situation aims to address the gaps, support from the larger ecosystem players in terms of timely payment of invoices would help start-ups manage their working capital cycles in an efficient manner and thereby increase their chances of survival in the initial years.

Ease of doing business early stage companies traditionally faced challenges related to complex regulatory and compliance requirements in India. While the policy steps envisaged under Startup India initiative such as self certification, public procurement guidelines, and tax exemptions provide the necessary framework to ease the regulatory and compliance burden of start-ups in their initial years, support from the respective state and municipal administrations is equally important in reducing the red tapism and encouraging start-ups from tier 2 and tier 3 cities solving local problems. Indian SMEs and start-ups have always demonstrated their resilience in surviving and thriving in challenging business environments. While the policies and support infrastructure envisioned under Startup India program aims to help start-ups in their initial stages of growth, the larger cultural implication of such large scale initiative to promote entrepreneurship is in inspiring the young population towards creating jobs and participating in the economic growth and nation building. The long term benefits of such demographic transformation would help secure India's leadership position in the emerging global order.



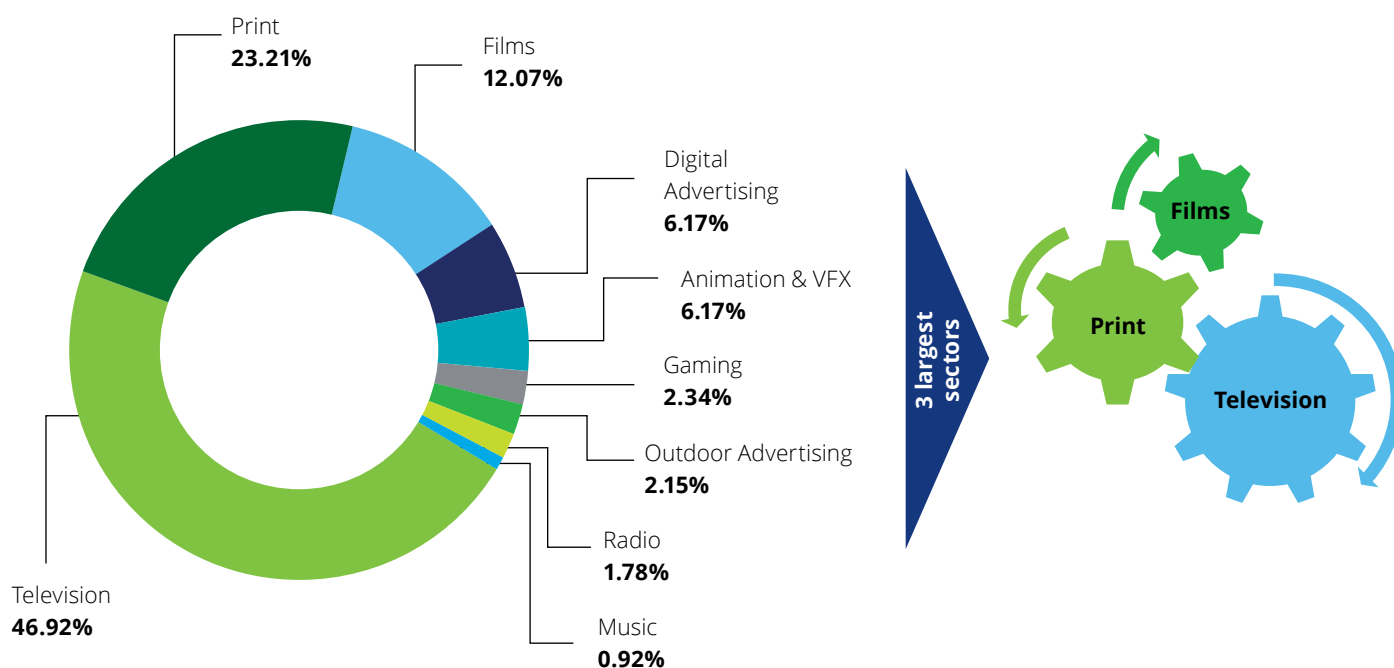
8. Media & Entertainment Industry profile



The Indian Media and Entertainment (M&E) industry is a sunrise sector with a rapid growth curve. The market size of M&E industry in India is estimated to be \$20.5 billion⁹⁸ (INR 1,370.63 billion) in 2016. M&E

is one of the industries identified by the government under “Make in India” initiative. The key sectors of M&E industry are outlined below:

Figure 22: Segmentation of M&E Industry 2016E

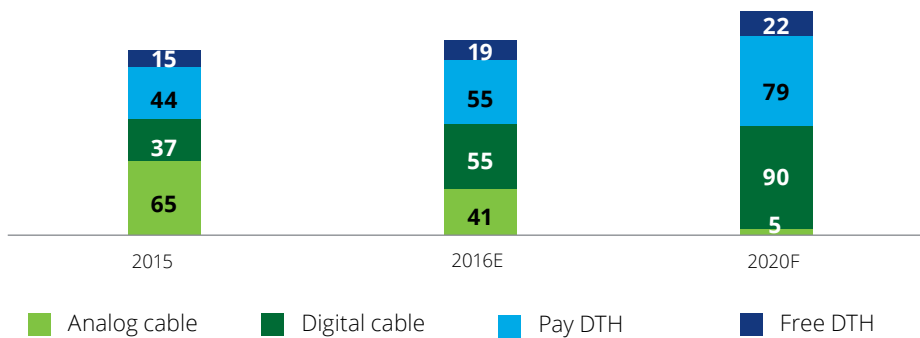


Source: IBEF

India is the world's second largest television market with 181 million⁹⁹ television households in 2016 and 892 television channels¹⁰⁰ (as on 30 Nov 2016). Television industry generated total revenue of \$9.6 billion (INR 641.8 billion) in 2016 with 65.96% share coming from subscription

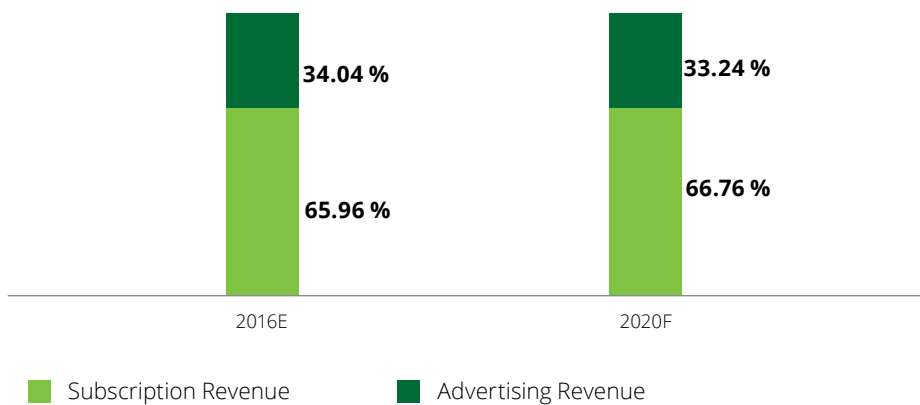
and remaining 34.04% from advertising. TV penetration reached 64% of total households in 2016. As is evident in the graph below, there has been an increase in the share of digital cable and direct-to-home (DTH) as a result of digitization.

Figure 23: Split by type of TV Subscribers



Source: IBEF
E: Estimated, F: Forecasted

Figure 24: Television Industry Revenue Share (%)



Source: IBEF
E: Estimated, F: Forecasted



The Ministry of Information and Broadcasting (MIB) has mandated that all analog networks be replaced with Digital Addressable System (DAS) which is scheduled to be completed in four phases. Viewers can access digital services only through a set top box (STB). Phases I and II, which focused on India's major metro markets (except Chennai) and 38 Tier I cities, have been completed. The revised timeline for Phase III was January 2017 (earlier December 2015), while Phase IV is expected to be completed by 31 March 2017¹⁰¹.

The cable TV market is highly fragmented with more than 230¹⁰² permanent Multiple System Operators (MSOs) to operate in DAS registered with MIB and more than 50,000¹⁰³ Local Cable Operators (LCOs).

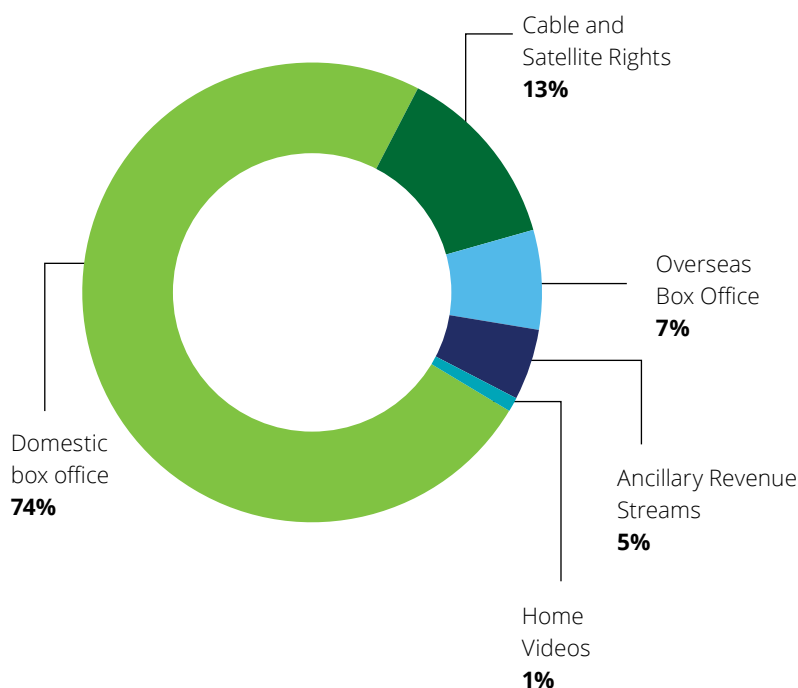
India is the biggest newspaper market with 110,851¹⁰⁴ registered publications as on 31st March 2016. Print sector is the second largest segment and market size was estimated at \$4.76 billion (INR 318.25 billion) in 2016. Growth is expected in regional print and local news segments.

Film sector is the third largest sector in M&E industry. The Indian film industry is the largest in the world in terms of number of films produced between 1,500 to 2,000 films produced every year in more than 20 languages.

In terms of revenue, the sector has gross box office realizations of \$2.06 billion (INR 138 billion)¹⁰⁵ in 2015 which is expected to grow at 11% CAGR reaching \$3.56 billion (INR 238 billion) by 2020. Domestic box office contributes majority of the revenue, representing 74% for the sector.

Another sector that has witnessed tremendous growth over last few years is the "Animation Industry." Key growth factors include increased usage of technologies such as 3D videos, movies, games and commercials. This has resulted in creating significant job opportunities for animators and developers. Cities such as Mumbai, Pune, Chennai, Bangalore and Trivandrum are emerging as animation hubs. To encourage the growth of this sector, state governments have proposed animation, visual effects, comics and gaming (AVCG) parks on SEZ model.

Figure 25: Films: Category-wise break-up of revenue



Source: Deloitte publication on "Indywood: The Indian Film Industry"

100% FDI is allowed in television sector including cable TV network, DTH. 49% FDI (under approval route) is allowed for up-linking of news and current affairs TV channels.

100% FDI in film sector is allowed under automatic route which has encouraged overseas studios to set-up presence in India/co-produce films.

26% FDI (under approval route) is allowed for publication of newspaper/periodicals and Indian edition of foreign magazines dealing with news and current affairs. 100% FDI (under approval route) is allowed for publishing/ printing of scientific and technical magazines/specialty journals/ periodicals and publication of facsimile edition of foreign newspapers.

Table 2: Information and Broadcasting – FDI inflows (January-September 2016)

Sub sectors	INR million	\$ million	% of Total inflows
Radio Broadcasting Plan	56,459.80	837.09	2.6
Print Media	69.17	1.03	0.0
Films and Entertainment	15,886.58	236.92	0.74
Sector total	72,415.54	1,075.04	3.34

Source: FDI Equity Inflows 2016, DIPP

Growth drivers of the Industry

- Rising incomes and evolving lifestyles
- Rapidly growing young population coupled with increased usage of 3G, 4G and portable devices
- Government initiatives and policies such as 'Make in India', 'Digital India'
- Implementation of proposed GST will result in transparency in the transactions. There are many transactions where the input taxes paid are not available as credit and are regarded as tax cost. Likewise, many transactions attract dual tax levies. GST should address this issue of cascading and dual taxation impact
- Increase in FDI inflows on account of liberalization in policy
- Animation, visual effects (VFX), gaming and digital advertising emerging as fast growing sectors
- International/foreign films gaining box office share

Potential for global expansion

- Potential for global expansion of Indian M&E industry with the US, UK and China.
- India to enter into co-production treaty with the US to promote co-production of films.
- FDI policy liberalized in the information and broadcasting sector. Roadshows can be conducted in the US and the UK to promote investment in Indian M&E sector.
- Expansion of footprint in terms of distributions of channels by Indian broadcasters in overseas countries.
- Expansion of territories for distribution of Indian films.

Government initiatives**Make in India**

- Promote Foreign Films shooting in India
- Develop technical skills for film production, post production, and VFX
- Explore additional film treaties

Digital India

- Digitization of cable television in 4 phases to attract institutional funding, improve profitability and value chain.
- Strengthen the sectors such as video streaming, online music consumption and gaming by increasing internet penetration.
- Give consumer better control in terms of subscription choices. It will also lead to increase in ARPU and subsequently increase in broadcasters' share of subscription revenues.
- The Budget reinforced India's huge shift towards digitization especially with the proposed deployment of high optic cables to increase internet penetration in rural India. This is a big positive for content creators as it will boost the digital content consumption across online and mobile platforms.
- Further impetus on digital payments and transactions will eventually help the subscription model.

Skill India

- Increase productivity of the existing workforce in M&E sector
- Develop technical skills for film production, post production and VFX
- Create employment opportunities - 1.2 million skilled workforce by 2022

Future prospects for the Industry

- **Shift towards Internet-based delivery platforms:** Over-the-top (OTT) platform that uses internet as a medium to distribute content is emerging as a business model. Disruptive pricing announcements on unlimited data and aggressive internet plans have benefitted the OTT sector. This sector has witnessed

a number of startups, leading production houses and also several international players foraying in the market.

- **Visual effects (VFX) and Animation Services:** India is considered as the most sought-after destination for animation and VFX services led by cost efficient, high quality service, affluent workforce and presence of hi-tech animation

studios. Entertainment conglomerates are increasingly outsourcing animation and special effects to India. Furthermore, cost of animation production in India is one fourth of North America and about 35%¹⁰⁶ lower than countries such as Korea and Philippines. In addition, several Indian studios have been successful in establishing a strong footprint in international markets.

- **Promoting India as a filming destination:** Ministry of Information and Broadcasting has set up the Film Facilitation Office (FFO) to facilitate efficient approvals and improving the ease of shooting in India. Filmmakers can expect clearance between 6-8 weeks, depending on the shooting location. India has signed film co-production treaties with 11 countries (UK, Spain, Germany, Canada, New Zealand, Brazil, Italy, France, Poland, China, and most recently, South Korea) providing a huge opportunity for growth. Negotiations are on-going to finalize the agreement with Australia.
- **Collaboration with international studios:** Over past few years, international film studios have collaborated with local film production houses to develop Hindi and regional movies. Local film production can leverage the experience of these international studios to expand their international reach and incorporate enhanced project planning and cost controls.
- **Gaming as a hot spot:** With increase in smartphones usage, adoption of 3G/4G internet network, India is poised to become one of the world's leading markets in gaming sector. To encourage the growth of this sector, incentives are provided by state governments, for units in SEZ. The State Government of Telangana aims to set up a "Center of Excellence"¹⁰⁷ with state-of-art facilities to promote gaming, animation, media and entertainment sector. To boost the start-up ecosystem in the state, Government of Telangana, in association with Software Technology Parks of India (STPI), has created an incubation center dedicated for animation, visual effects, comics and gaming (AVCG) industry start-ups. In addition the Karnataka Government

has also proposed to set up center of excellence with state-of-the-art facilities along with AVCG parks on SEZ model¹⁰⁸.

- **Under Penetrated Multiplex Screens:** India is still under penetrated in terms of screens which means there is a huge scope of growth for the film sector. With the proliferation of multiplex screens coupled with technology to conveniently book tickets, footfalls are expected to increase. Many foreign players have expanded their base in India by acquiring a controlling stake and increasing the number of screens across the country.
- **Broadcasting channels in overseas countries:** On account of huge Indian population residing overseas, there is an opportunity for Indian broadcasters to expand their footprint overseas by broadcasting channels in such countries. Apart from the above, content syndication now extends to local audiences as well.

Conclusion and recommendations

- **Improving screen density ratio:** Screen penetration in India at present is significantly low at 6 screens per million¹⁰⁹. Many single screen cinemas have been shut down due to high operational cost, non-viability of running on a standalone basis and low occupancy rate. Government should consider providing financing support through tax holidays in respect of conversion of single screen to multiscreen, extra floor space index and access to capital at lower interest rates. Conversion of 75% of the existing single screens into two screen multiplexes can unlock revenues of INR 40-50 billion for the film industry through higher average ticket price, occupancy rate and advertising and food and beverage revenues.
- **Skill development in M&E:** There is a scarcity of formal training institutes and creative technologies in India. Currently, most of the personnel are trained on the job or self-trained. There must be a concerted effort by the government and industry to develop training institutions with proper financial and infrastructure support.

- **Promoting India as a filming destination:** India should consider to adopt a globally recognized standard to boost film shooting across various locations in India. The government must provide quick approvals to help filmmakers get all clearances. The government should ensure ease for obtaining approvals, availability of local talent, production resources and adequate infrastructure facilities for attracting foreign producers to shoot films in India.
- **Grant infrastructure status to broadcasting sector:** Broadcasters and distribution platforms should be accorded "infrastructure status" so as to obtain better and affordable financing options in the present capital-intensive growth phase.
- **Enter into more co-production treaties for incentivizing co-production of film:** In order to widen the reach of Indian cinema, the Government of India must explore additional film treaties that would help in boosting the film industry as well as developing skills in the local talent pool.

9. Sports Services

Industry profile

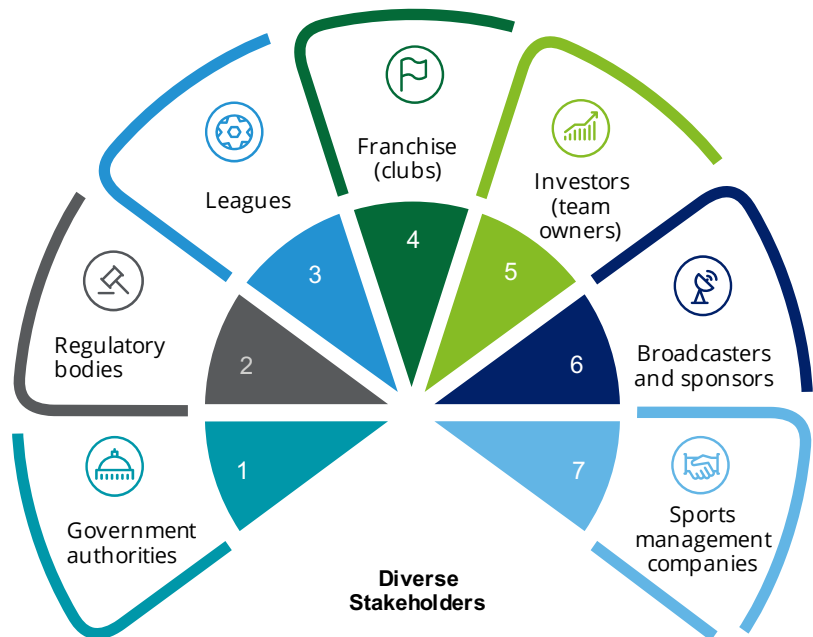


Sports sector in India has seen a speedy growth over the past few years with increasing investments from corporate houses in sports properties and events, expanding spectator base and rising number of sports television channels. The global sports market is estimated to be worth \$480-620 billion¹¹⁰ in 2015. The sports sector includes different segments such as sports tourism, sporting goods (in manufacturing and retail), sports medicines, sporting management and sponsorship.

However, the Indian sports market is still at a nascent stage and accounts for a meagre 2%¹¹¹ share in the global sports market. The number of stakeholders involved in the Indian Sporting industry continues to increase with the advent of new leagues. The below diagrams depict the key stakeholders involved in sports management. In India most of the sports marketing spend comes in the form of sponsorships and advertising during sports events.

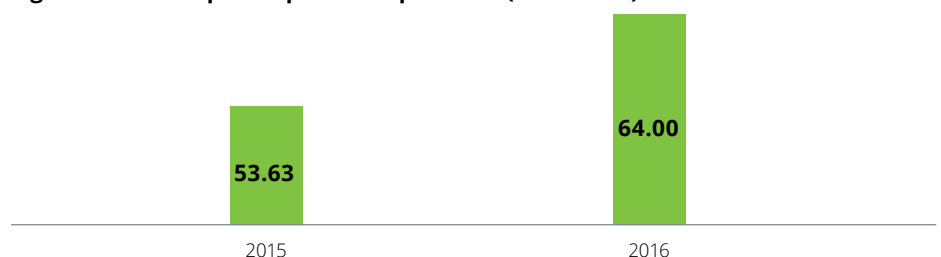
In 2016, the Indian sports sponsorship market grew 19.3% to INR 64 billion¹¹² (\$0.95 billion). The money flowing into sports sponsorship is mainly from five segments - on-ground sponsorship, media spends, team sponsorships, franchise fees and endorsements.

Figure 26: Diverse Stakeholders

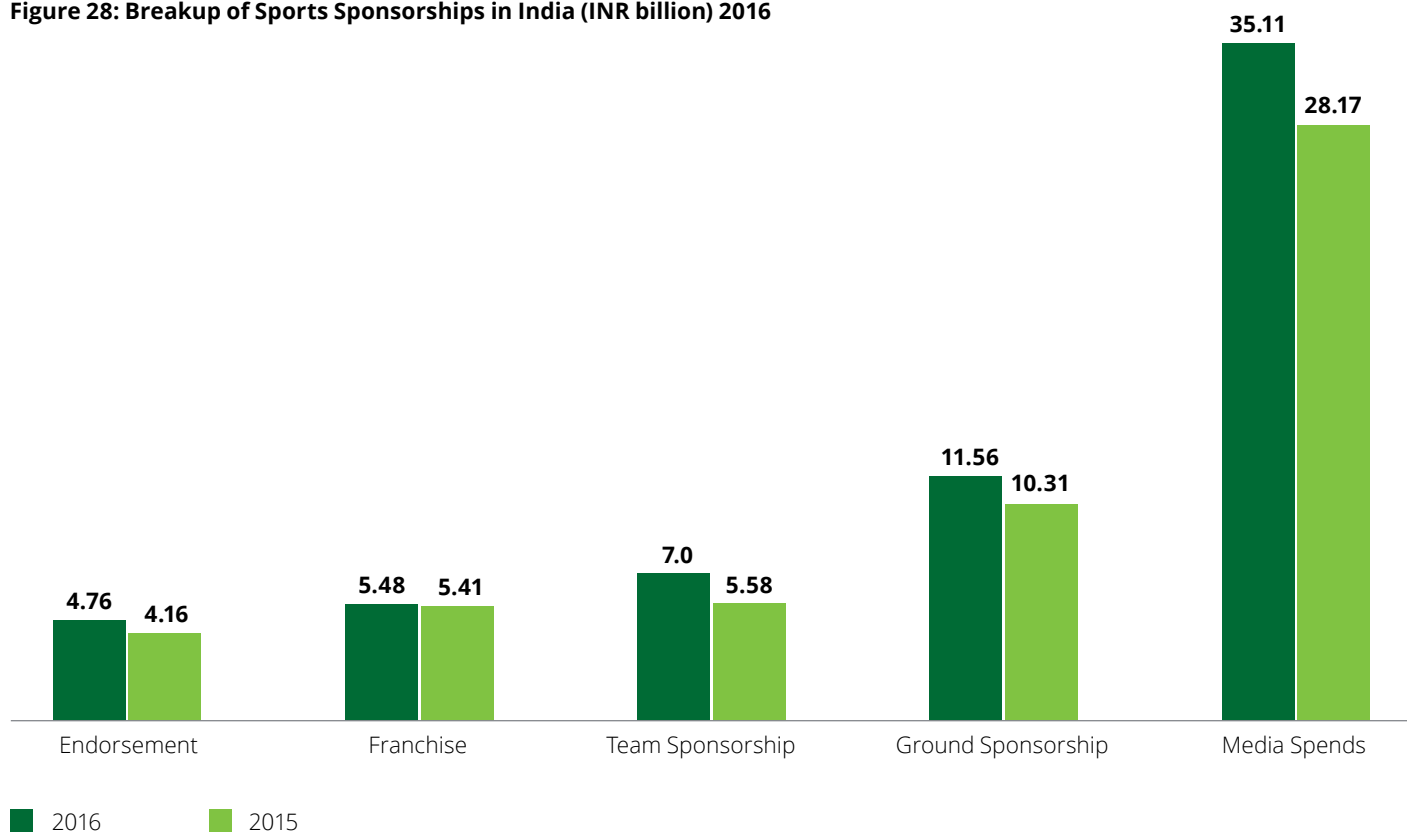


Source: Deloitte Publication

Figure 27 : India Sports Sponsorship Market (INR billion)



Source: ESP Properties – Sportz Power report

Figure 28: Breakup of Sports Sponsorships in India (INR billion) 2016

Source: ESP Properties- Sportz Power Report

Of the total sponsorships, media spends accounted for 54.8% share followed by on-ground advertising/sponsorship (18.2%), team sponsorships (10.9%), franchise fees (8.5%), and endorsements (7.4%).

Cricket continues to dominate sports sponsorships in India. The growth in sponsorships was also due to emergence of new non-cricket sports leagues – Indian Super League (ISL), Pro Kabaddi League (PKL), World Kabaddi League, Champions Tennis League and Indian Premiere Tennis League. Kabaddi was the growth driver in 2016 on back of a two-season Pro Kabaddi League and India hosting the Kabaddi World Cup in Ahmedabad.

Further, there has been a significant increase in female audience that now forms a large segment of the growth story. The online sports audience has expanded too, fueled by better mobile and internet connections and affordable data plans.

The Ministry of Youth Affairs and Sports (MYAS), under the Government of India is implementing various projects through the Sports Authority of India (SAI). At present, there are 70¹¹³ STC (SAI Training Center) with a total strength of 1183 trainees (775 boys & 408 girls).

In Union Budget 2017-18, the Sports Ministry was allocated a total of INR 19.43 billion¹¹⁴ (\$288 million), compared to INR 15.92 billion (\$237.6 million) last year given that Indian athletes are preparing for Commonwealth Games and Asian Games in 2018.

Recently in Oct 2016, the Union Finance Ministry has approved inclusion of sports in the harmonized master list of infrastructure sub-sectors¹¹⁵ to be eligible for obtaining long term financial support from banks and other financial institutions.

Potential for global expansion

MYAS has MOUs/agreement¹¹⁶ pertaining to sports with Australia, France, Hungary, Kazakhstan, Kuwait, Maldives, Mauritius, Netherland, New Zealand, Seychelles, Turkey and Turkmenistan. These agreements have strengthened cooperation and have contributed to enhancement of sports and social development.

Another potential area of expansion is that of South Asia Association for Regional Cooperation (SAARC) nations that has been a part of PM Narendra Modi's vision. South Asian Games (SAG) is a biennial multi-sport event held among the athletes from SAARC countries viz. India, Sri Lanka, Bangladesh, Afghanistan, Nepal, etc. The 12th South Asian Games was held in Guwahati and Shillong in 2016 wherein India secured 308 medals including 188 gold medals.

Government initiatives¹¹⁷

"Khelo India" (National Programme for Development of Sports)

- Develop sports infrastructure in both rural and urban areas
- Guiding and nurturing of the talent through assistance to SAI Training Centres and Academies and State Government training centres/academies
- Setting up of new academies both in public and PPP Mode.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

- Develop sports infrastructure especially playgrounds owned by Government schools
- To promote sports in rural areas and providing them with basic materials such as volleyball nets, cricket materials, football etc.

Rashtriya Yuva Sashaktikaran Karyakram (RYSK)

- Flagship program of MYAS to enable youth to realise their potential
- New umbrella scheme which consolidates Nehru Yuva Kendra Sangathan (NYKS), National Youth Corps (NYC), National Programme for Youth & Adolescent Development (NPYAD) and National Discipline Scheme (NDS), National Young Leaders Programme (NYLP)

Future prospects for the industry

Sports Facilities and Infrastructure Service

- The emergence of new leagues and teams have driven the need for infrastructure development sporting venues. Recently, MYAS gained the approval of Ministry of Corporate Affairs (MCA) for inclusion of sports infrastructure, construction and maintenance as part of CSR activities¹¹⁸.
- Several Indian corporates like JSW, Reliance Foundation and Tata Group have opened modern facilities to train students through various programs¹¹⁹.
- Several MNCs like Business Club Australia, Hockey Australia are also investing in infrastructure development. Well-known clubs like FC Bayern Munich (Germany), Barcelona (Spain) and Manchester United (UK) have also collaborated with local clubs.

Sports Education and Skill Development

- It is estimated that about 1.33 million¹²⁰ young people are likely to take up sports as their full time profession by 2017 in India. MYAS is implementing various projects through the Sports Authority of India (SAI) to find new talents.
- Accordingly, there is a huge demand of coaches and trainers for different sports. Several Indian corporates and renowned Indian sportspersons have already opened state-of-the-art academies with modern facilities and services to train raw talents. Some are listed below:
 - Gopichand Badminton Academy
 - Prakash Padukone Badminton Academy
 - Bhaichung Bhutia Football Schools
 - Mary Kom Boxing Academy
 - Bhiwani Boxing Club
 - Netaji Subhash National Institute of Sports
 - Mahesh Bhupathi Tennis Academy (MBTA)
 - Gun For Glory Shooting Academy
 - Sehwa International School

Sports Tourism

- Mega sporting events¹²¹ such as the Hockey World Cup and the 19th Commonwealth Games (both held in New Delhi in 2010), along with the ICC Cricket World Cup held in 2011 attracted a number of tourists and sports enthusiasts. India will also stage the Under-17 football World Cup in October 2017 that will boost sports tourism.
- Simultaneously, there has also been a marked rise in the number of tour operators and agents specializing in servicing the requirements of this particular tourist segment. Even mainstream tour operators have set up separate divisions to tap the potential of sports tourism.
- Sports medicine is another area that is highly underpenetrated. By providing treatment at a very competitive rate equipped with latest in-house laboratory services and professional staff, this segment offers a huge opportunity for growth in sports tourism.

Sports Marketing and Management Services

- The growth and development of the Indian sports industry is creating opportunities for management professionals in a wide variety of settings. New sports initiatives require professional human capital to speed up its growth. But in India, availability of professional sports managers are less or minimal.

Creation of Digital Assets and Content (OTT Platforms)

- Over-the-top (OTT) platform that uses internet as a medium to distribute content is emerging as a business model. Disruptive pricing announcements on unlimited data and aggressive internet plans have enabled Indians to increasingly watch sports content online. India's active OTT video subscribers are expected to grow to 105 million¹²² by 2020. starsports.com, Liv Sports, starsports.com, Neo Sports already have OTT platforms¹²³ dedicated only for sports.

Sports Data Analytics¹²⁴

- The popularity of data driven decision-making in sports is increasing. Every major professional sports team either has an analytics department or an analytics expert on staff. Teams often have to scan scout notes from clipboards, convert those PDF's to Excel, and then hand those files over to data developers. There are now entire websites dedicated to the research and analysis of sports statistics and how they relate to a prediction in performance.

Fan Engagement

- Sports franchises in India are taking several initiatives to increase fan engagement. While it was traditionally just in-stadium and TV but at present fans are touched digitally through web, mobile, content sites (own and third-party) and numerous social channels. Other touch-points include merchandise sales, F&B POS, online sales channels, third-party operators for tickets, tours, etc. Other initiatives include starting a fan page on official website, extensively using social media to connect with fans, arranging for fans to meet team players and even organizing training camps and talent hunt programs.

Virtual Reality Gaming Experience

- Virtual Reality (VR) is one of the unexplored areas and is the most sought after technologies in sports. VR, an upcoming technology uses computer technologies that use virtual reality headsets to generate the realistic images, sounds. This technology has been explored to create gaming lounges. These gaming destinations provide unmatched range of games that offers a superlative virtual-reality experience for sports enthusiasts. Recently, a cricket legend has been roped in as the brand ambassador of one of such gaming lounges.

Rise of Adventure and Fantasy Sports

- Adventure sports¹²⁵ in India has shown an impressive growth with rising disposable income and willingness among Indians to look beyond the usual holidays for

new experiences. India having a diverse geography provides extreme adventure activities like sky diving, mountaineering, trekking, bungee jumping, mountain biking, river rafting, rock climbing and deep sea diving. With rising demand, the number of tour operators offering specialized packages in this category have also increased.

- Another category that will witness growth is that of fantasy sports. In India, fantasy sports is called 'game of skill' which is outside the purview of gambling. With rising number of sports enthusiasts, internet penetration and usage of smartphones, India would be an obvious destination and business choice for fantasy sports operators. Nagaland¹²⁶ is the only state in India that has issued online gaming licenses for skill games including fantasy sports.

Conclusion and recommendations

Grant industry status to sports sector:

The Government should grant industry status to sports sector which will increase the participation of private sector, generate more revenue streams and help sport-centric employment generation. Government should consider providing financing support through tax exemptions for earnings from sports or reduction in import duties on expensive sports equipment.

Augment sports infrastructure and ensure its proper utilization:

With International tournaments like FIFA U-17 World Cup scheduled to be held in October 2017, the Government should carve a separate fund. In addition, Government must propose more of sport cities in various states to develop integrated sports complex that will encourage different sports and promote healthy lifestyle. Also, the Government should ensure ease of access for grounds maintained by schools and colleges to boost asset utilization.

Incentivize and promote sports among specially abled:

With a successful spell in Rio Paralympics 2016 after securing four medals, the Government must focus more on encouraging and allocating funds for

sports promotion among the specially abled. More initiatives must be taken for identifying and nurturing their sports talent. The Government must also provide various incentives in form of sports quota in jobs, financial assistance, pension and cash rewards to give an impetus to them.

Structured sports education with special emphasis on sports medicine:

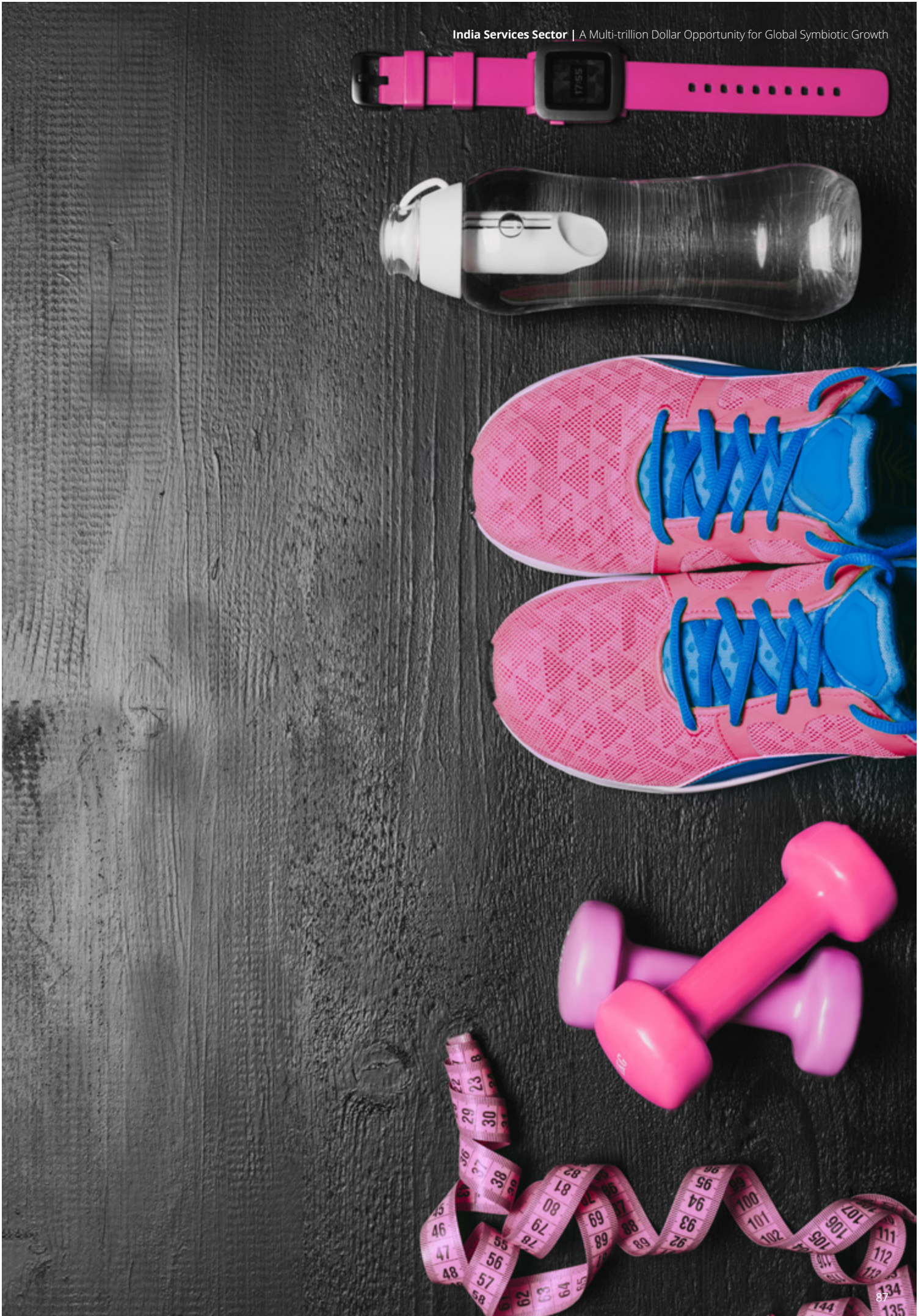
Priority should be guiding and nurturing talent through existing sport academies and new set up either by Government or State Government in PPP model. The Government must emphasize more on opening of sports universities in different states likewise the proposed National Sports University in Manipur. It should also incentivize sports medicine segment by setting integrated diagnostic, pre-rehabilitation, treatment, rehabilitation services for sports injuries.

Increase bids to host events:

The Government must encourage bidding to host mega sport events in India in order to boost tourism and increase exposure to sports facilities. In its road map, NITI Aayog has advised the government to bid for and host 100 major international sports events till 2026 by creating a separate arm under the Sports Authority of India¹²⁷.

Development of a common platform:

A system for registration, rating and publishing information about all sports facilities should be established in the form of web portal. The portal should also have information like rating of existing sports facilities, inclusion of private facilities in the region, information on coaches available at these venues, transportation facilities like nearest bus or metro station, membership fees, timings and details of available sports facilities. A sports (event) calendar for using the existing infrastructure through the year in various sports by various teams should be drawn. This will allow organized and increased participation from budding as well as existing sportspersons, and also give opportunity to boost sports tourism.

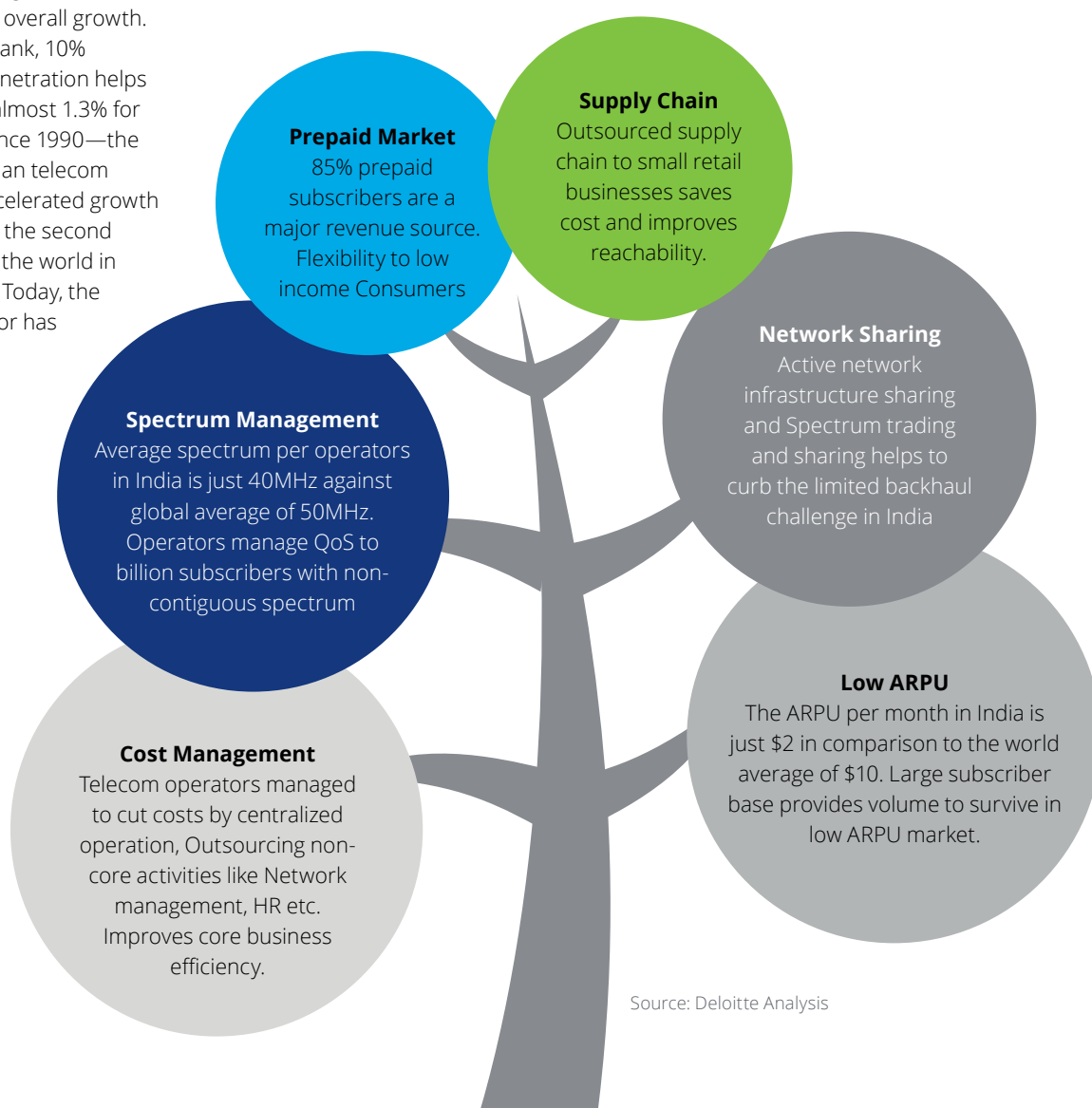


10. Telecom Industry profile



Telecom industry, in particular, high speed internet connectivity has significant importance in a country's overall growth. As per a study by World Bank, 10% increase in broadband penetration helps the economic growth by almost 1.3% for developing economies. Since 1990—the era of liberalization of Indian telecom sector, there has been accelerated growth in the sector and it is now the second largest telecom market in the world in terms of subscriber base. Today, the dynamics of telecom sector has changed as the

Figure 29: Unique features of Indian telecom market



Source: Deloitte Analysis

non-traditional services such as banking, education, payment, infrastructure, etc. are gaining momentum.

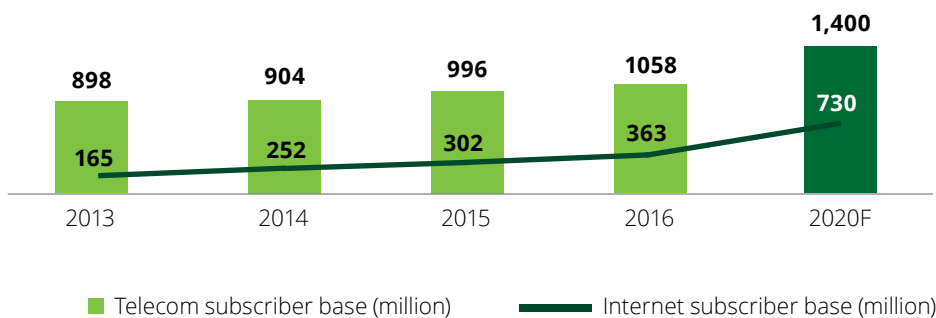
Indian telecom sector has established itself as a unique market over the years by setting new parameters in efficient service offerings as shown in the figure. While the global telcos are nearing saturation in their markets, Indian telecom sector continues to find innovative ideas for a sustainable business.

Market segments

Telecom services: The fastest growing telecom services market is expected to reach \$103.9 billion¹²⁸ by 2020 at a CAGR of 10.3%. The total mobile services market is expected to touch \$37 billion in 2017. The global telecom services market size, in terms of revenue is \$1.2 trillion in 2016¹²⁹. The market is highly competitive with 12 active operators fighting for their share of the consumers' wallet. Though India has the lowest Average Revenue per User (ARPU) i.e. \$2¹³⁰ in comparison to global average of \$10/month¹³¹, the sector is still attractive for domestic and global players owing to its large untapped potential in terms of mobile and internet services in the rural areas. The sector has attracted

cumulative foreign direct investment (FDI) of \$18.38 billion since April 2000¹³². The mostly voice-centric market has seen high growth in the internet subscribers and data usage with the increasing adoption of 3G and 4G services in the last few years. The average minutes of usage (MoU) has come down to 319 minutes in 2016 from 446 minutes in 2006¹³³. The revenue from voice services, which used to be the major source of revenue with a share of 80%, has been going down. The sector is expected to generate 700,000 jobs in the next 5 years driven by high investments and growth¹³⁴. The top five players in the market are responsible for almost 78% of the market share in terms of subscriber base.

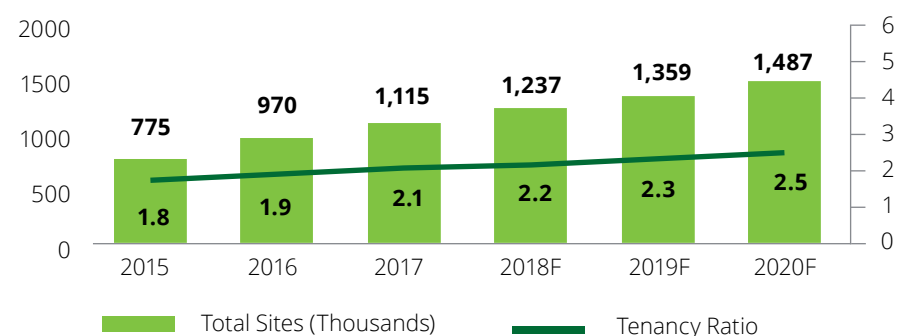
Figure 30: Telecom subscriber base growth



Source: GSMA

Infrastructure services: The telecom infrastructure sector in India is an important part of the telecom sector. With continuous growth in the telecom sector, the tower sector also grew by 320% from 100,000 in 2006 to reach 420,000 by 2016. The Indian telecom operators, both own and manage the towers as well as outsource the service to independent tower operators. The tenancy ratio has increased to almost 2 per tower¹³⁵. Due to emerging technologies and high adoption for wireless network, the BTS sites have also grown exponentially and had reached 1.1 million BTS sites by 2016. There is a huge demand for telecom towers and BTS sites to provide high Quality of Service (QoS) and manage better coverage. As per a Deloitte study, the tenancy ratio is forecasted to reach around 2.5 by 2020¹³⁶.

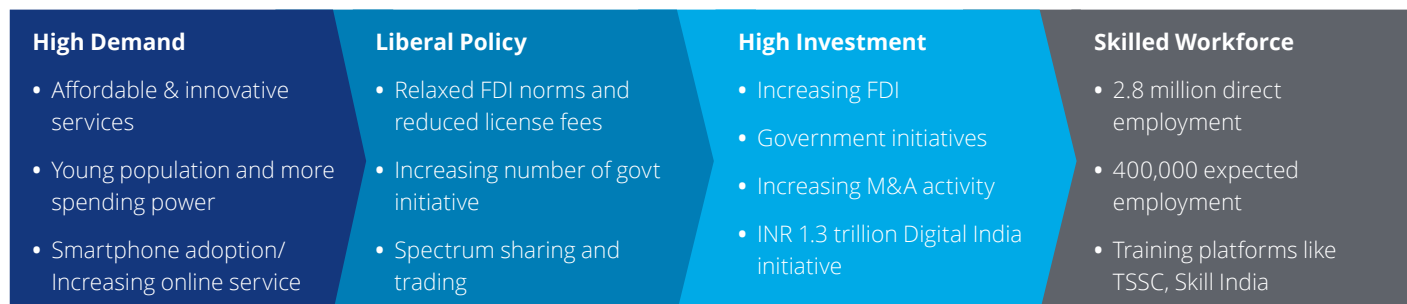
Figure 31: Telecom tower growth



Source: Deloitte's Telecom Tower report 2015

Growth drivers for the industry

Figure 32: Growth drivers for the industry



Source: Deloitte Analysis

Government initiatives

The government initiatives such as Digital India, Skill India, Make in India and Start-up India are transforming socio-economic development of India. The massive push from government and huge investments make India an attractive market for global as well as local players.

Digital India: Digital India provides a platform for telcos to invest in different areas such as communication, payment, governance and digitization, etc. The saturating global telecom services sector is starting to leverage the INR 1.3 trillion Digital India opportunity. This initiative has created high interest in global peers and top communication and IT service providers.

- Digital payments:** With a focus on moving towards less cash economy, the digital payment sector has initiated new interfaces such as Aadhaar Pay, BHIM app, UPI, etc. to enable mobile-based payments. Telecom sector can leverage these solutions by connecting the masses and providing banking interfaces, security and storage.
- BharatNet:** The massive infrastructure push to connect 250,000 gram panchayats has been underway and there is huge telco involvement for infrastructure building, and providing Common Services Centers (CSCs) in villages. This is expected to generate massive direct and indirect employment opportunity in India.

- eKranti:** National e-Governance Plan 2.0 through its 44 Mission Mode Projects is underway to ensure ICT enablement and electronic delivery of services. It spans sectors such as e-education, e-healthcare, e-courts, police, insurance, income tax, property registration, passports, pension, land records, road transport, municipalities, banking & financial inclusion¹³⁷.

- Big data analytics for social change:** Big data analytics is a growing market in India and is expected to reach \$16 billion by 2025¹³⁸. Telecom service providers can leverage on the huge amount of data like call drop records, etc. by storing and analyzing it to provide insights on different government initiatives under Digital India.

- Skill India:** The Skill India initiative has 249 training partners and 3,222 training centers to provide online and classroom education platform for students. There is massive growth in online education services in India and huge number of foreign universities are investing to provide vocational courses, certifications, etc. Telecom services sector can facilitate in providing online platform and robust connectivity to Skill India initiative.

Start-up India: The new Start-up India policies encourage more tech start-ups to establish business in India and provides an attractive platform for foreign investment and funding. India ranks third after the US and the UK in terms of highest number of technology start-ups.

Potential for global expansion

Africa and Latin America: The sector has many opportunities for cooperation with African countries as well as some developing Latin American countries to share the ICT expertise, solution and application development, skill development and innovation.

UK and US: The government initiatives like Digital India, Smart Cities Mission and Make in India has provided an attractive platform for European and US companies to invest in India. Other countries like Sweden, France and Germany are starting to invest as well. Handset manufacturers from the US and China are investing in India for manufacturing quality handsets at a low cost.

South East Asian Nations: The developing nations can leverage on the experience of India in taking telecom services to the remote corners of the country using cost effective solutions and innovative business models.

Future prospects of the Industry

Rising demand: The sector serves around 1.15 billion subscribers of which the lion's share belongs to the urban India with tele-density of 165 while rural tele-density is just 52.8.¹³⁹ The Internet subscriber base is expected to reach 730 million by 2020¹⁴⁰ while the total telecom subscriber base will reach 1.4 billion during the same period¹⁴¹. Comparing the vast population of India and the ratio of urban-rural population which is 30:70, the potential is huge in both

areas. Urban population looking for more advanced services and penetrating the untapped rural areas.

The telecom products and services export is expected to reach \$10 billion (INR 620 billion) by 2020. India's telecom services exports currently stands around INR 12 billion.¹⁴² South-East Asia, Latin America, Africa, Middle East as well as North America have shown growing interest to choose India as a source of telecom products and services.

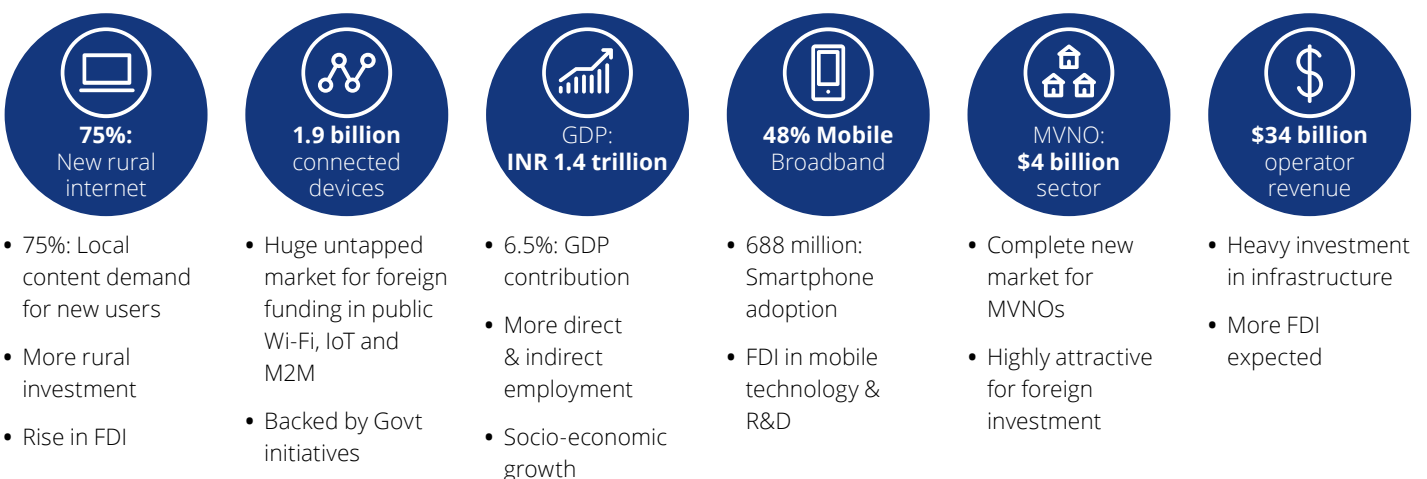
Consulting Services in emerging economies:

The African ICT sector is expected to triple by 2025, to reach \$80-95 billion¹⁴³. Indian telecom sector has been a case study in the global peers due to ICT developments, new innovations, experienced professionals and consulting services, etc. There is a strong presence of Indian telecom services in Africa and Indian ICT companies enjoy a first mover advantage in the continent. Though there is large presence, of Indian companies, there is still scope for mid-sized enterprises to

enter the industry, normally by partnering with local service providers. Recently, major Indian software companies expanded their operations and delivery centers in Africa, implementing low-cost models in strategically situated delivery centers to serve outsourcing customers in Europe and West Asia. Major ICT demand in Africa emanates from South Africa, Ghana, Nigeria, Kenya, and Egypt. Many Indian ICT companies are expanding to countries like Ethiopia, Uganda, and Malawi. The accelerated ICT requirements for emerging economies like Africa, rising urbanization and spending power, and increase in the western as well as Asian multinational corporations into different sectors like manufacturing, telecom and natural resources, which demand IT support systems and infrastructure, provides new opportunities for Indian telecom service providers as well as ICT players in the country. Overall, Indian companies' low-cost innovative business models have been particularly successful in attracting business from enterprises focused on mobile technologies, e-governance, skill development and social media.

Non-traditional services: Telecom companies are slowly transforming the traditional business models to adapt to the new generation of services. Operators are diversifying their business to different sectors like Machine-to-Machine (M2M), Internet of Things (IoT), virtual reality, augmented reality, machine learning, and connected world, smart healthcare, education, infrastructure and ecommerce, etc. The presence of M2M and IoT can be seen almost everywhere from coffee machines and smart wearables to large organizations and cities due to the digitization drive. Indian IoT market is expected to grow to \$15 billion by 2020 from \$5.6 billion in 2016¹⁴⁴ and the global market is expected to reach around \$3 trillion by 2020.¹⁴⁵ Similarly, the Indian M2M market is expected to reach \$35.16 billion by 2020.¹⁴⁶ According to Cisco figures, Internet of Everything is estimated to create business value of up to \$511 billion over the next decade in India.¹⁴⁷ Many innovative technology start-ups from India and other parts of the world have started big investments in M2M and IoT platforms.

Figure 33: Sector potential at 2020: Encouraging investments



Source: The Mobile Economy: India 2016, GSMA

Conclusion and recommendations

Ease of doing business: India ranks at 130 out of 189 countries in World Bank's

Ease of Doing Business Index 2016¹⁴⁸. The gradual removal of red tape policies is making India an attractive market for

investment. However, there is still an urgent need for regulatory reforms to attract more foreign funds into the sector.

Subject	Present Status	Recommendations
TAX	Retrospective taxation	<ul style="list-style-type: none"> Simplification and Rationalization of tax regime will provide financial stability to the Indian telecom.
Spectrum Usage Charges	3%	<ul style="list-style-type: none"> Spectrum usage charges should be reduced as operators pay for spectrum at market driven price
License fee	Circle A – 10% AGR Circle B - 8% AGR Circle C – 6% AGR	<ul style="list-style-type: none"> License fee should be nominal rates 13-14 % License and Spectrum fee discourages investors
USOF	5%	<ul style="list-style-type: none"> Current USOF rate is too high. USOF funds should be utilized properly.
Spectrum	Fragmented spectrum	<ul style="list-style-type: none"> Policies on efficient utilization of spectrum Road-map to provide contiguous spectrum in future Utilize the unutilized spectrum
Right of Way	Unclear	<ul style="list-style-type: none"> Need of clear Right of Way framework for Infrastructure set-up. Uniform RoW regulations across all states

R&D spending: India ranks at 51 in University research ranking and at 36 in government spending on R&D out of 56 countries.¹⁴⁹ India performs poorly in patent application and filed just 45,568 patents in 2015 in comparison to China's 1.1 million patents. Innovation, and Engineering research and development (ER&D) need more investment from the government and skill building should be considered an area of priority.

The telecom sector in India is destined for high growth and the aggressive digital movement by the government has accelerated the growth. The market provides exciting opportunities for both, the domestic and international stakeholders. The growing demand of mobile technologies, data services, mobility, smart technologies and governments' push towards liberalized services for ease of doing business have

come at the right time increasing the attractiveness for higher investments. With innovative business models, volume market and high growth potential, India is poised to be the global powerhouse of telecom services and a hot destination for investors.

11. Logistics

Industry profile



India's logistics industry is highly fragmented. While there is a growing presence of large pan-India players, the industry is still dependent on multiple small regional players. Even as manufacturing companies in India resort more to logistics service outsourcing, it will take time to catch up with other economies such as the US and China which have a reasonably mature third-party logistics (3PL) market with large service providers managing the entire supply chain across multiple geographies through enhanced use of appropriate technology, thereby reducing cost.

India spends around 14.4% of its GDP on logistics and transportation sector¹⁵⁰ as compared to 8.5% in the US, 18% in China and 20% in Singapore.

Figure 34: Road, Rail, Shipping and Air FDI in India (\$ million)

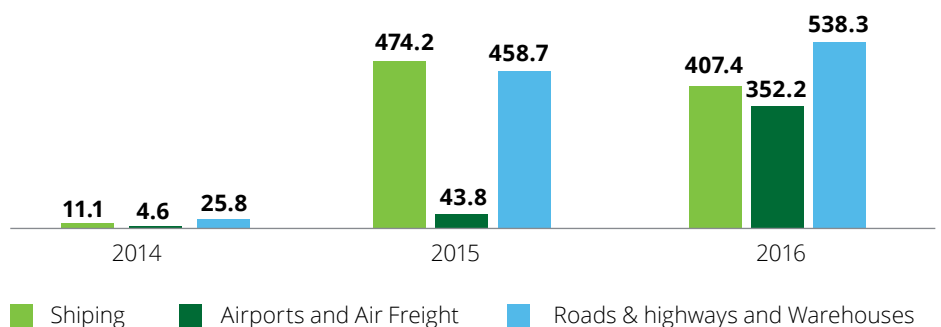
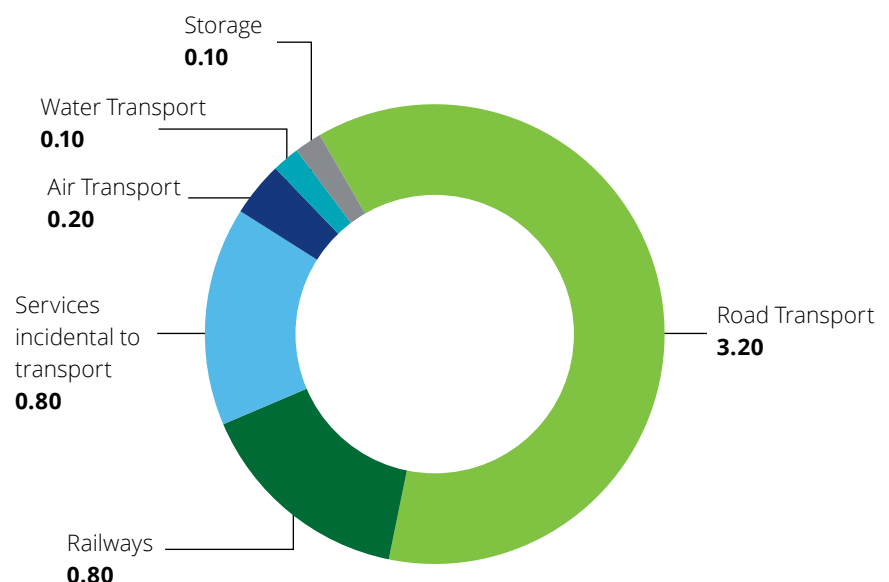


Figure 35: Share of Logistics Sector in Gross Value Added (GVA) 2015-16



According to the World Bank's biennial measure of international supply chain efficiency, called Logistics Performance Index (LPI)¹⁵¹, India's ranking has jumped from 54 in 2014 to 35 in 2016, ahead of some advanced economies such as Portugal and New Zealand^{152 153}. Recent FDI trends show that Indian logistics sector is gaining traction and is expected to attract more FDI due to government policy initiatives in this sector.^{154 155} The government has laid much emphasis on infrastructure development, with hefty investments on building new interstate highways and national waterways, attracting FDI in railways, privatization of national ports, labour reforms and use of PPP model in infrastructure development.

Market segments

The logistics industry is broadly divided in the following components: Transportation (different modes of transport), Terminal

Services (rail and road terminals, airports, ports, inland water terminals), Storage and Warehousing (cargo and containers) and Value-adding activity.

Transportation

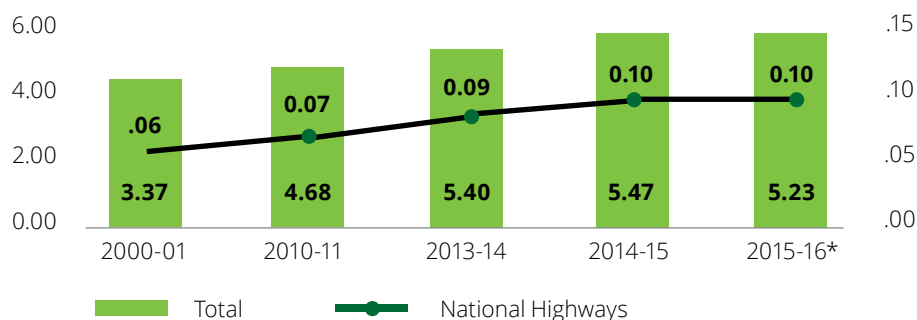
The transport system in India comprises distinct modes such as road, rail transport, shipping and inland water transport, and air. The National Transport Development Policy Committee (NTDPC) had estimated the modal share of rail and road in the total freight traffic to be 35:65 in the 12th Five Year Plan, 39:61 in the 13th, 45:55 in the 14th and 50:50 in the 15th Five Year Plan. Total investment in transport was projected to increase from about 2.6% of GDP in the 11th Plan to 3.3% in the 12th Five Year Plan, and stabilising at 3.7% in the 13th, 14th and 15th Plans.

In absolute terms, the annual investment in railways, roads and other transport, would increase to INR 3,800 billion (\$70 billion) during the 12th Plan, INR 6,300 billion (\$110 billion) in the 13th Plan and rising to about INR 14,000 billion (\$250 billion) in the 15th Plan.

Road

The road network of India comprises of National Highways (NH), State Highways (SH), Other Public Works Departments (OPWD) Roads, Rural Roads and Urban Roads. It has reached 5.47 million km in FY2015¹⁵⁶ with National Highways constituting nearly 1.8% of the total network in FY2015.^{157 158} The market size of the road logistics industry, on basis of freight rate and freight traffic growth—as provided by the Ministry of Road Transport and Highways—is estimated to be \$40,503 million in FY16, growing at CAGR of 9.2% over the past four years.¹⁵⁹

Figure 36: Road Network in India (million km)



Source: MORTH

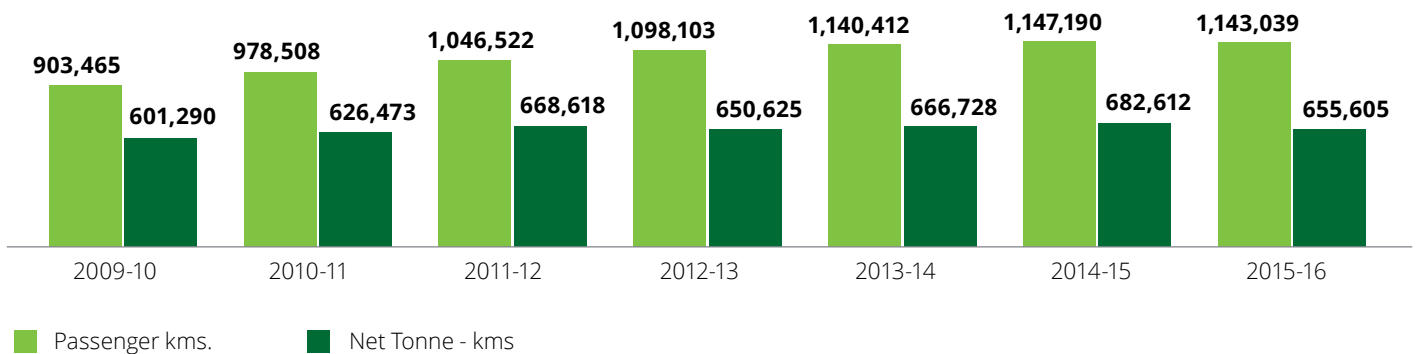
Railways

India is the fourth largest rail freight carrier in the world and the largest passenger carrier.

Indian Railways earns nearly 70% of its revenue from the freight segment. Major

commodities carried by Indian Railways are coal, iron ore, food grains, iron & steel, fertilizer, cement and Petroleum products. Freight traffic has seen a consistent increase during FY2009-10 to FY2015-16, growing at a CAGR 1.2%.¹⁶⁰

Figure 37: Traffic on Indian Railways (million)



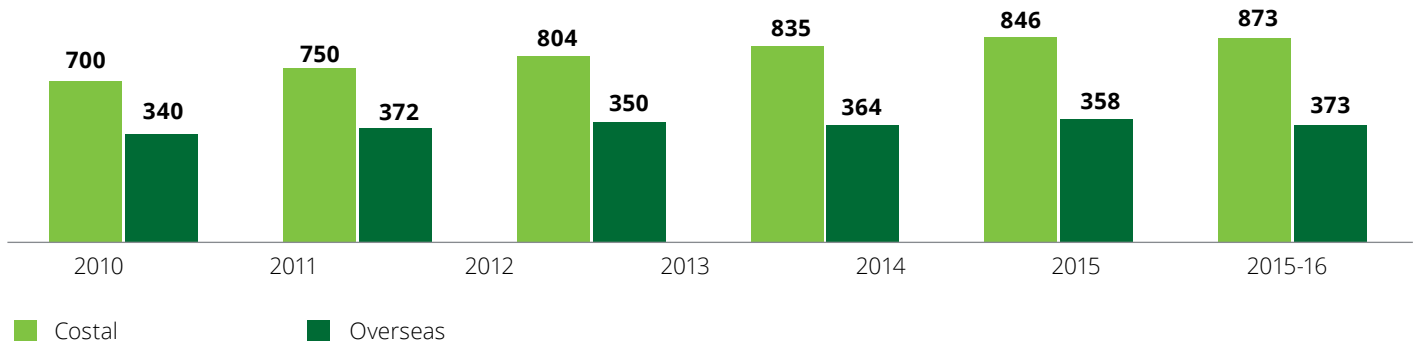
Source: Indian Railways

Shipping (Coastal shipping, deep sea)

India had a fleet strength of 1,246 vessels with gross registered tonnage (GRT) of 10.51 million as on December 2015¹⁶¹, as compared with fleet strength of 1,204 vessels with 10.31 million GRT as on

December 2014. 873 vessels (70.1%) with 1.50 million GRT are engaged in coastal trade and the remaining 373 vessels (29.9%) with 9.01 million GRT are deployed for overseas trade.

Figure 38: Growth of Indian Shipping Fleet



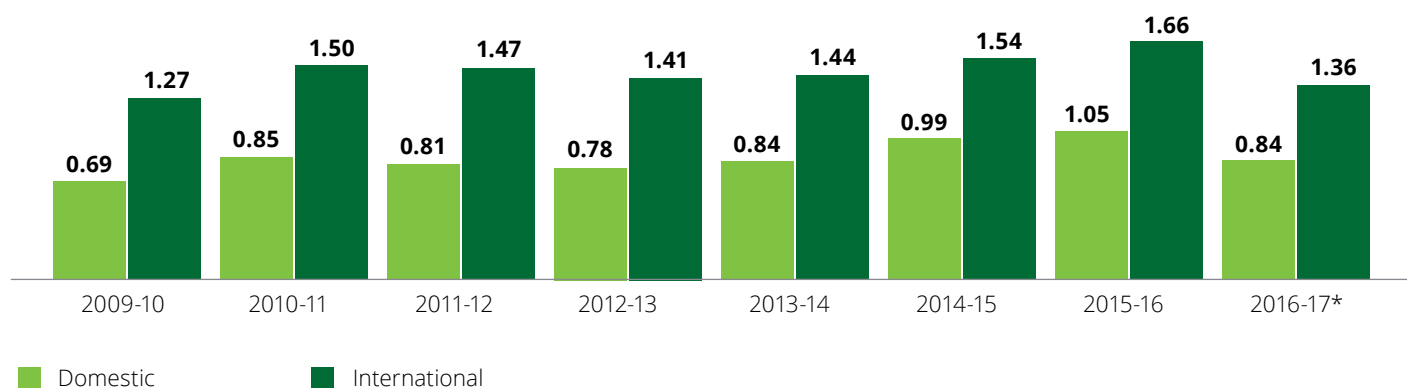
Source: Indian Shipping

Air

Air cargo supply chain includes airlines, customs, ground services, air cargo forwarders, domestic transportation, air cargo terminals, distribution centres and integrated international express services centres.

During FY2016¹⁶², domestic freight traffic increased at 6.08% while international freight traffic increased at 7.55% as compared with FY 2015.¹⁶³ Rise in import and exports is the key driver for growth in freight traffic in India.

Figure 39: Growth of Air Cargo Traffic in India (million tons)



Source: AAI

Terminal logistics

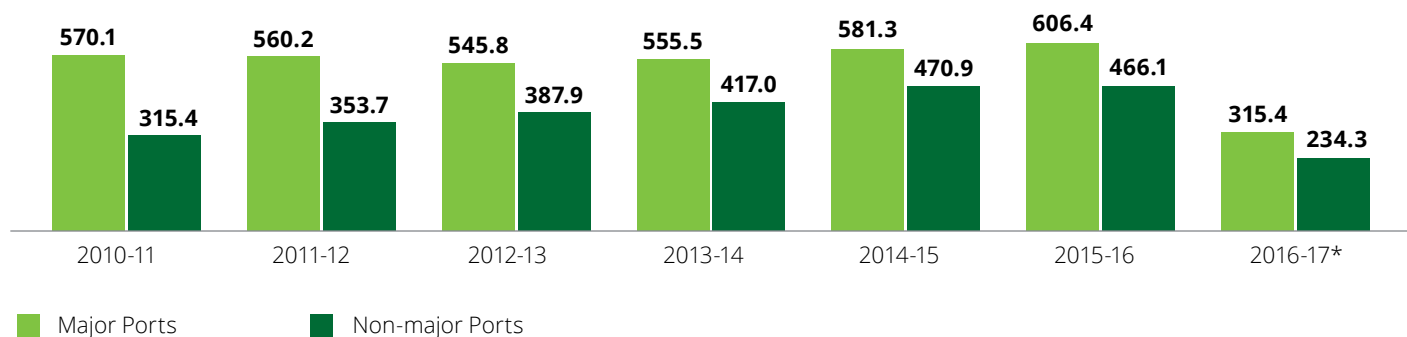
Ports

According to the Ministry of Shipping, around 95% of India's trading by volume and 70% by value is handled via maritime transport. India has 12 major and 200

minor and intermediate ports. Cargo traffic at major ports stood at 606.37 MMT in FY2016, increasing at a CAGR of 0.9% during FY11-17. Cargo traffic at non-major ports stood at 466.1 MT in FY15-16.^{164 165}

The Ministry of Shipping has set a target capacity of over 3,130 MMT by 2020, driven by participation from the private sector.

Figure 40: Cargo Traffic at Major and Non-major Ports (million tons)



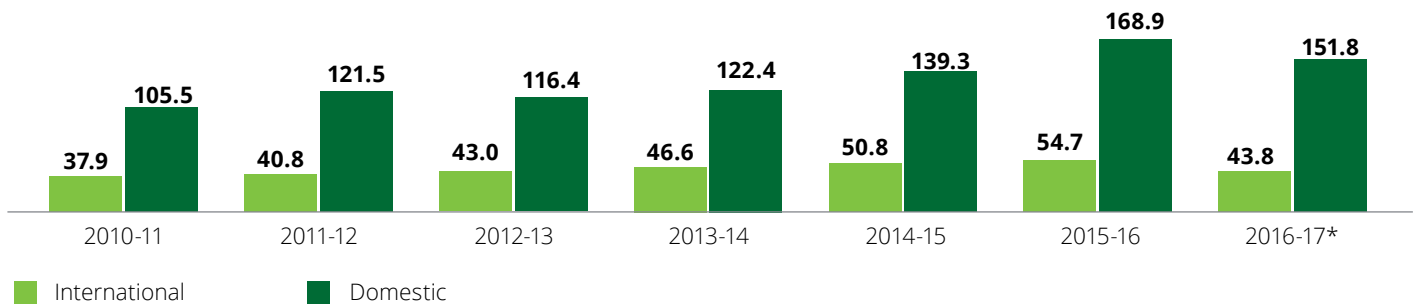
Source: Shipping.nic

Airports

India is the ninth largest civil aviation market in the world. In FY2017, civil aviation sector of India witnessed a growth rate of around 20-25%. Total international and domestic aircraft movements have witnessed an increase of 14.7% during

April-December FY2016-17.¹⁶⁶ The international passenger traffic increased by 8.7% and domestic passenger traffic increased by 22.6% respectively, during April- December FY2016-17¹⁶⁷ as compared to the same period last year.

Figure 41: International and Domestic Passenger Traffic (million)



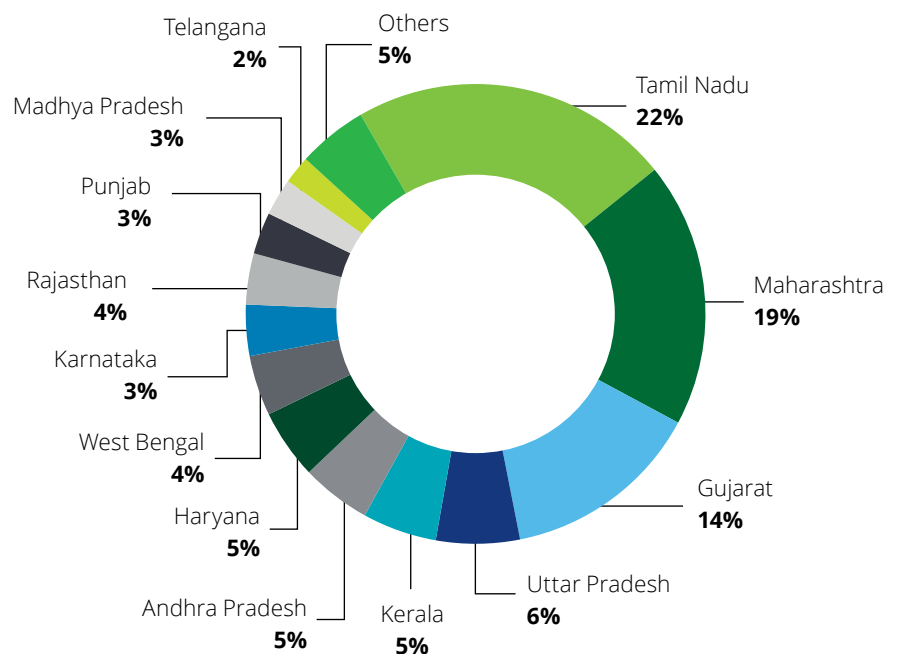
Source: AAI

Inland Container Depots/Container Freight Stations/ Private Freight Terminals (ICD/CFS/PFTs)

ICDs/CFSs act as hubs in the logistics chain. The government and the private sector have set up ICDs/CFSs for handling and temporary storage of containerized cargo.¹⁶⁸ They are largely concentrated in the NCR region, Tamil Nadu, Maharashtra and Gujarat and cater to maximum demand in the northern hinterland and the coastline running through the other parts of India^{169, 170}.

A large number of Private Freight Terminals are also being built on the rail network in response to the Indian Railways (IR) initiative. These are third party terminals meant to handle rail traffic efficiently and support the last mile connection through improved warehousing, handling, and transportation.

Figure 42: ICD/CFS by States (2016)



Source: NCFS

Inland Water Terminals

The Inland Waterways Authority of India (IWAI) is responsible for the development and regulation of inland waterways in India.¹⁷¹ India has five declared National Waterways (NW I to V), out of which, three are operational with an annual cargo movement of ~7 MMT.

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The IWAI has identified development and operation of Kolkata Terminal's GR Jetty -I, GR Jetty-II & BISN and Patna

Terminal's Gaighat & Kalughat on National Waterways -1 under the Public-Private Partnership (PPP) model.¹⁷²

National Waterway	Location	Stretch (Kms)
NW 1	Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia	1,620
NW 2	Brahmaputra river from Sadiya to Dhubri	891
NW 3	West Coast Canal from Kottappuram to Kollam along with Champakara and Udyogmandal canals	205
NW 4	Godavari & Krishna rivers & Canals between Kakinada and Puducherry	1,095
NW 5	Brahmani river & Mahanadi delta system along with East Coast Canal	623

Trans-shipment Hubs

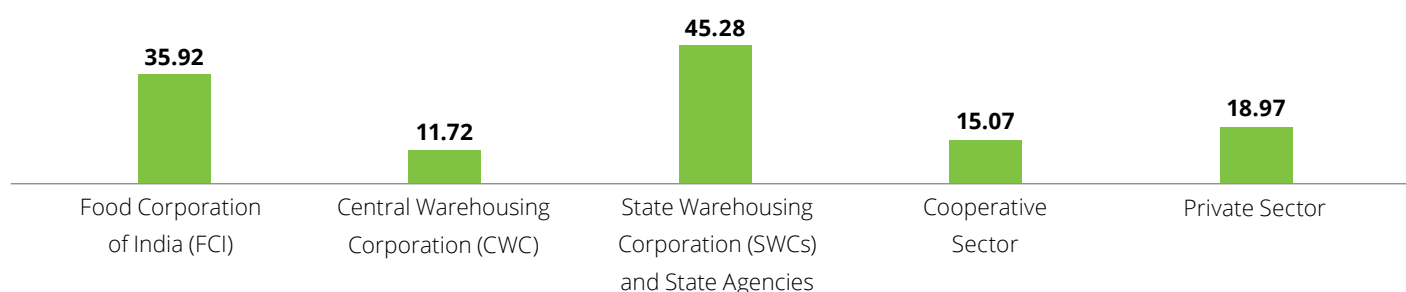
India's first trans-shipment hub, International Container Transshipment Terminal (ICTT) built at Vallarpadam, Cochin handles mother container ships of 8,000+ Twenty Feet Equivalent Units (TEUs) capacities. It has substantially reduced the need for transshipment of Indian containers through ports of other countries, thereby resulting in reduced transportation cost and time.¹⁷³

Storage and Warehousing

Storage and Warehousing infrastructure is created to deal with both cargo and containers: Industry/Retail, Liquid cargo (Crude oil, Petroleum products, Chemicals, Edible Oils etc.), Agricultural commodities and, Cold Storage for perishable cargo and stack areas for storage of loaded and empty containers.

The total capacity of organised warehouses in India is 126.96 million tons. About 80 to 85% of organised warehousing sector is controlled by Government and PSUs. The private sector has only 18.97 million tons. About 30% of the warehousing capacity is held by unorganised small godown players who lack scale and quality.^{174 175}

Figure 43: Warehousing Capacity in India 2016



Source: WDRA

	Industry/retail warehousing	Liquid storage	Agri-warehousing	Cold stores
Key industries	Automotive, electronics & electrical, textiles, pharmaceuticals, machine and engineering, fertilizers	Oil and gas, petroleum refineries, chemicals, edible oil units	Agriculture and FMCG	Dairy, meat and poultry, sea-food, fruits & vegetables, pharmaceuticals, agriculture
Size/ Infrastructure			Estimated to be worth INR 80-85 billion (2013)	As of 2014, India had 7,000 cold stores, with a total capacity of 32 MT ¹⁷⁶ .

Growth drivers for the Industry

- **Agriculture based demand:** India is one of the largest producer of vegetables and fruits in the world. It represents a vast opportunity for logistics and cold chain players to capture the untapped potential in the market.
- **Increasing focus on third party logistics (3PL):** The concept of 3PL Logistics is still at a nascent stage in India, but provides growth opportunities for organised players. Indian firms are looking at new logistics capabilities and more complex solutions from their 3PL partners in order to focus back on their core business. 3PL provides the ability to bring down conventional logistics costs and handle more complicated tasks.
- **Rise of e-commerce market in India:** Robust growth in e-commerce market is likely to drive growth of logistic business in India. Major e-commerce retailers have moved towards a marketplace model where a third-party logistics (3PL) company is assigned with the task of picking the product directly from the vendor and delivering it to the customer.
- **Goods and Service Tax (GST):** Implementation of GST is expected to lead to consolidation of warehouses, improved efficiencies due to reduction of trade barriers, revaluation, sourcing and manufacturing decisions.¹⁷⁷
- **Infrastructure:** Development of infrastructure such as dedicated freight corridors, logistics parks, growth in free-

trade warehousing (FTWZ), multimodal logistics parks (MMLP) and container freight stations, multi-modal transport services,

- **Specialised services:** Emergence of specialised services, such as liquid logistics, temperature controlled logistics or cold chain and reverse logistics.

Government initiatives

- **Make in India:** Government's Make in India scheme to enhance the manufacturing sector in India will drive logistics infrastructure as manufacturing sector spends about 2.2% of its revenue on logistics.
- **Bharatmala and SetuBharatam** have been announced to build stronger network of National Highways. **National Highways Interconnectivity Improvement Project** ensures safe, fast and all weather movement of traffic on National Highways. **Logistics Efficiency Enhancement Programme (LEEP)** aims to enhance freight transportation by improving cost, time, tracking and transferability.
- In Railways, the **Eastern Dedicated Freight Corridor (1,856 km)** and **Western Dedicated Freight Corridor (1,504 km)** projects are under implementation. It will strengthen India's present rail infrastructure to carry very high levels of freight leading to a reduction in cost of transportation and inventory.^{178 179}

- The **Sagarmala Program** focuses on development along 4 thematic areas viz. port modernization & new port development, port connectivity, port led industrialization and coastal community development.
- The **Coastal Economic Zones (CEZ)** will lead port-led development through coastal economic zones (CEZs) in eight coastal states with balanced ecosystem, large contiguous land, access to urbanisation and supporting infrastructure.¹⁸⁰
- **Multimodal Logistics Parks (MMLP)** has been proposed to set up at 15 locations in Maharashtra, Punjab, Gujarat, Rajasthan, Tamil Nadu, Karnataka and Telangana.^{181 182 183}
- **Union Budget 2017:** The total allocation for National Highways has been increased from INR 579.76 billion (\$8.8 billion) in 2016-17 to INR 649 billion (\$9.9 billion) in 2017-18. The outlay for Indian Railways is INR 1,310 billion (\$20.06 billion) vis-à-vis INR 1,210 billion (\$18.5 billion) in 2016-17.
- The government envisions airport infrastructure investment of INR 744.42 billion (\$11,400 million) under the 12th Five Year Plan (2012-17). It plans to invest INR 119.5 billion (\$1,830 million) for development of airport infrastructure along with aviation navigation services by 2026.

Future prospects for the industry

The logistics industry is expected to grow at 8.6% annually during 2015-2020 and be worth \$307 billion by 2020.

- **Consolidation of warehouses:** Logistics players are looking at consolidation of their warehouses to set up larger integrated facilities, increasing supply chain efficiencies.
- **Emergence of Multimodal Logistics Parks (MMLP):** Logistics companies are setting up MMLP connected with rail network, container yards and warehousing (with value-added services such as cross docking, inventory management, packaging and labelling).
- **Development of coastal shipping:** Coastal shipping or use of water as a mode of transportation is much safer, economical, and a less polluting mode of transport. It will provide increased opportunities in container-feeder services. Coastal shipping can carry large parcel sizes and provides opportunity for consolidation of loads and over-dimensional cargo.
- **Increase in containerisation of cargo:** Private and government ports are focusing on container cargo. Containerisation of cargo has brought a significant change in the organisation of port terminal services, resulting in higher demand for sophisticated handling equipment, inland logistics capabilities, and service efficiencies.¹⁸⁴
- **IT-enabled logistics:** Indian companies are focusing on IT-enabled logistics, such as the development of logistics planning and co-ordination systems to contribute towards development of 3PL services.¹⁸⁵
- **Intelligent transport systems:** India represents a huge scope for intelligent transport systems (ITS) that would provide real time monitoring of trucks and trains through GPS and integrate the same into one system.

Potential for global expansion

- Major logistics players are expanding their global presence across Latin America (Brazil, Mexico and Argentina), Africa (Nigeria), and Asia (Indonesia, China, Hong Kong and Singapore) via joint ventures and global mergers. Several large players have also set up import export trading divisions to focus on international trade.
- Expanding presence across the critical value chain in logistics, Indian players are expected to become major beneficiaries of global trade.

Conclusion and recommendations

- **Expansion of road infrastructure** and focus on **last-mile roads** connecting all roads and port terminals to warehouses and distribution centres.
- The development of **multimodal logistic parks** will improve the entire logistics network in India and lead to efficient operations.
- Development of new **IT-enabled technological systems** will lead to improved operations, enable high-level tracking as well as help in removing inefficiencies.
- Focus should also be laid on introducing **green logistics** to help improve the environmental footprint.
- India faces increased requirement for logistical skills, with demand for warehouse managers, **logistics managers**, coastal seafarers and IT services expected to rise in future. CII and National Skill Development Corporation, has set up a Logistics Sector Skill Council to address these issues through a structured skill development program.
- Digitising warehousing operations would lead to strengthening of supply chain operations, it will also considerably lower the costs of logistics operations.



12. Retail & E-commerce

Industry profile



The Indian retail industry has emerged as one of the most dynamic and fast-paced industries due to the entry of several new players. It accounts for over 10% of the country's GDP and around 8% of the employment. India is the world's 5th largest global destination in the retail space.

The aggregate revenue of the top 250 retail players globally was \$4.31 trillion in 2015. The global e-Commerce market was estimated at \$1.4 trillion in 2016.

India's retail market is expected to nearly double to \$1 trillion by 2020 from \$600 billion in 2015, driven by income growth, urbanisation and attitudinal shifts. While the overall retail market is expected to grow at 12% per annum, modern trade would expand twice as fast at 20% per annum and traditional trade at 10%.

India's Business to Business (B2B) e-commerce market is expected to reach \$700 billion by 2020 whereas the Business to Consumer (B2C) e-commerce market is expected to reach \$102 billion by 2020. Online retail is expected to be at par with the physical stores in the next five years.

India is expected to become the world's fastest growing e-commerce market, driven by robust investment in the sector and rapid increase in the number of internet users. Various agencies have high expectations about growth of Indian

e-commerce markets. Indian e-commerce sales are expected to reach \$100 billion by 2020 from \$30 billion in FY2016.

E-Commerce has transformed the way business is done in India. The dynamic pace of the Digital age in India has forced all major companies to take steps to cater to the consumer expectations. A prerequisite to success in the e-commerce industry is to create innovative, sustainable, consistent and seamless shopping experience within all facets of consumers.

The growth of the e-Commerce industry has been triggered by increasing internet and smartphone penetration in not only metro cities but also in tier two and tier three cities of India. Mobile devices are further expected to drive sales via e-Commerce platforms in future.

Emerging trends

Ongoing innovation: All the existing e-Commerce companies aim to effuse a strong vision to build Exponential Organisations whose impact is huge. Exponential Organizations are led by innovative imperatives and enablers such as digitisation, technology enablement, analytics, cloud-based solutions and mobilisation of services.

Internet penetration: The e-Commerce industry in India has been propelled by the rise in internet penetration due

to major improvements in the telecom infrastructure. With 3G and 4G services making way into India along with declining data tariffs, spend on internet data is growing significantly. Government schemes such as Optical Fibre Network can significantly increase internet penetration in the rural communities as well as provide a means to e-Commerce companies to tap the huge market potential there.

Smartphones are demonstrating ways and means to exhibit massive growth in the coming years. The widespread adoption of smartphones is being propelled by several factors such as high competition leading to low prices, prevalence of internet enabled services and ease of accessibility to content.

The leading e-Commerce companies state that almost 70-75% of their online traffic comes from mobile phones and thus higher revenues are coming from mobile applications.

New payment solutions: Cash-on-Delivery (CoD) remains a popular mode of payment for Indian e-Commerce transactions. Cash transactions result in high administration costs even for the e-Commerce companies which reduces their margins. Hence, new digital payment solutions are evolving to address these challenges.

Demonetisation has played a key role in enhancing new payment solutions. Further, the Indian government's initiative to extend banking facilities to its previously unbanked citizens through the 'Jan Dhan Yojna' scheme has added significant number of debit cards thereby providing these customers access to electronic payments. There has been launch of electronic wallets and also digital payment products from traditional banks for faster check-in and check-out of e-Commerce transactions to ease the payment process in e-Commerce.

The launch of Unified Payments Interface (UPI) by Reserve Bank of India is aimed to transform the mobile banking. UPI is expected to benefit the e-Commerce industry as well by reducing the number of failed e-Commerce transactions due to complicated transaction flows in the current payment systems. The implementation of UPI will enable the e-Commerce delivery staff to collect money electronically for even CoD transactions. For early adaptability, several e-Commerce companies have already started building applications that will facilitate mobile payments on UPI. However, the challenge will be to balance safety, integration and mass-adoption.

Ancillary sectors: Customers are getting accustomed to next-day delivery of products. Due to challenges in terms of handling huge volumes of delivery, return orders and higher standards of customer service, the industry has seen rise of several third-party logistics companies (3PLs) who handle last-mile deliveries and reach the hinterlands of the country mainly in tier 2 and 3 cities.

Logistics lies at the heart of e-Commerce and a large number of third-party logistics service providers have entered this space to provide customised last-mile deliveries. However, the increasing logistics costs associated especially with return orders requires innovative and analytical driven models that will increase operational efficiencies in Reverse logistics. This will help e-Commerce companies to drive towards profitability.

India Post with its extensive reach of people and post offices across the country has set-up dedicated processing centres to handle last-mile deliveries of the e-Commerce companies.

Even in the B2B e-Commerce space, logistics companies are beginning to partner with online truck aggregators and freight marketplaces such as Freight Tiger to build trust and accelerate intercity freight transactions. Such aggregators are increasingly poised to become leading B2B marketplaces for the logistics industry in India.

Government initiatives

The Government of India has taken various initiatives to improve the retail industry in India.

- Government of India has allowed 100% FDI in online retail of goods and services through the automatic route, thereby providing clarity on the existing businesses of e-commerce companies operating in India. The government has also signed pacts worth INR 15 billion (\$222.36 million) in a wide range of sectors including retail and steel and gas. FDI equity inflows in retail trading were \$936 million (April 2000–December 2016).
- The Ministry of Urban Development has come out with a Smart National Common Mobility Card (NCCM) model to enable seamless travel by metros and other transport systems across the country, as well as retail purchases.
- Implementation of GST is expected to enable easier movement of goods across the country, thereby improving retail operations for pan-India retailers.
- With the allowance of 100% FDI in single brand retail, investor sentiment will get further push. Rapid emergence of organised retail outlets, such as mega malls and hypermarkets, are augmenting the growth of organised retail in the country. Retailers have made dynamic changes in supply chain and logistics for competitive advantage and meeting consumer demands.

- The Government has approved a proposal to scrap the distinctions among different types of overseas investments by shifting to a single composite limit, which means portfolio investment up to 49% will not require government approval nor will it have to comply with sectoral conditions as long as it does not result in a transfer of ownership and/or control of Indian entities to foreigners. As a result, foreign investments are expected to increase, especially in the attractive retail sector.
- Just recently the announcement of abolishment of Foreign Investment Promotion Board (FIPB) is a bold step taken by the Government to boost foreign investments into India.

Future prospects of the Industry

E-commerce is expanding steadily in the country. Customers have the ever increasing choice of products at the lowest rates. E-commerce is probably creating the biggest revolution in the retail industry, and this trend would continue in the years to come. Retailers should leverage the digital retail channels (e-commerce), which would enable them to spend less money on real estate while reaching out to more customers in tier-2 and tier-3 cities. Both organised and unorganised retail companies have to work together to ensure better prospects for the overall retail industry, while generating new benefits for their customers.

Nevertheless, the long-term outlook for the industry is positive, supported by rising incomes, favourable demographics, entry of foreign players, and increasing urbanisation.

It is expected that India will retain its current position as the third-largest retail market in Asia and the fourth-largest in the world (after the US, China and Japan) until 2018, after which it is likely to overtake Japan. Retail sales grew by 6.5% in volume terms in 2015, and growth is forecast to accelerate in 2016 given improved economic growth and rural demand. The Economist Intelligence Unit expects retail sales to accelerate sharply during 2017-20, rising to \$1.70 trillion by 2021.

Earlier this year, the government began to pay increased salaries and benefits to central-government employees and pensioners, back dated to January.

On 8 November 2016, India demonetized its high-value currency notes to curb “black money” (undeclared income). This has caused a definite shift to formal banking and electronic modes of payment.

India expects to replace its indirect tax structure with an efficient goods and services tax. Items such as consumer electronics, white goods and beauty products could become cheaper, while others, like textiles, edible oil and cheap footwear, could become more expensive. An additional tax will apply on demerit and luxury goods such as cigarettes, aerated drinks and high-end cars, though effective rates will probably not rise.

India's youthful population is becoming brand- and fashion-conscious, especially in the big cities, where increasingly affluent households are acquiring a taste for luxury items. Many global brands are targeting this segment.

E-commerce is expected to be the next major area supporting retail growth in India. With growth in the e-commerce industry, online retail is estimated to reach \$70 billion by 2020 from \$3 billion in 2014. The value of online retail purchases made by consumers in India is projected to cross \$100 billion by 2017.

The key drivers of online retail are a young population aided by easier access to credit and payment options, increasing internet penetration and speed, 24-hour accessibility, and convenient and secured transactions.

Online retailers continue promotional prices in the market, offering a significant boost to e-retailing in consumer durable sector. Options like cash-on-delivery and manufacturers' warranty add fuel to this rage. Cash-on-delivery is the most preferred payment option with over 30% of buyers opting for it in India. The computer peripherals, cameras and mobiles, and lifestyle segments account for a majority of total purchases

It is imperative for a retailer to have a strong distribution and logistics network to succeed in this sector. Players follow a distribution network that suits them the best.

Companies are now adopting innovative marketing strategies for their business. Certain players in this sector are focused on a particular segment. Some of the large retailers exclusively operates hypermarkets and home retailing businesses. They focus on maintaining its competitive advantage and gaining benefits of scale through focusing on efficiency and productivity

Retailers are opting for many channel to maximise sales, provide convenience and for enhanced productivity. Omni-channel retailing is being adopted by many retailers in India.

Retailers benefit if consumers perceive their store brands to have consistent and comparable quality and availability in relation to branded products. For this, retailers are providing more assortments for private label brands to compete with supplier's brand. New product development, aggressive retail mix and everyday low pricing strategy help to get edge over supplier's brand.

Conclusions and recommendations

As the consumers journey to purchase becomes increasingly facilitated by enabling technologies, companies need to engage and influence consumers at every stage of the process, from research to the final purchase decision. It's imperative to target the right consumer with the right message in the right moment through whatever device they are using. Retail and ecommerce companies should develop solutions to support the latest trends in brand personalization. This has implications for the supply chain and the talent needed to manage the process in a more complex environment. For larger enterprises that tend to be structured around traditional lines of business, this will likely mean a learning curve.

Companies should modify their traditional marketing strategies and tactics, developing contemporary messages delivered through cutting-edge, digital platforms in light of the evolving drivers of consumer purchase and consumers' continued immersion in the digital world.

Due to the shifting composition of the consumer population and the growing influence of the young consumers, retail and ecommerce companies will need to develop strategies to both understand and optimize innovation and marketing communications that address these trends.

13. Environmental Services

Industry profile



According to the Global Water Market 2014, India is one of the top four markets in global water treatment, along with Brazil, China and United States. Population explosion, coupled with rapid urbanization and industrialization, has resulted in increased generation of solid wastes in urban as well as rural areas of the country. Further, with increasing political thrust and public awareness, solid waste management is starting to receive due attention.

The waste management market comprises of various sub-segments across solid waste (urban, industrial, agricultural, electronic, bio-medical and radioactive), and liquid waste (waste generated from washing, flushing or manufacturing processes of industries, sewerage). In addition, gaseous waste (released in the form of gases from automobiles, factories or burning of fossil fuels) also adds on to the air pollution load opening up air quality monitoring and purification market. The nature of waste such as hazardous and non-hazardous wastes, add another important dimension of treatment and technology. These various types of waste (Municipal, industrial, e-waste, bio-medical waste) are governed by different laws and policies under various departments.

The following statistics provide a snapshot of the critical environmental challenge that India is facing at present:

- According to the Central Pollution Control Board (CPCB) of India, of the 62 million tons of solid municipal waste generated each year, only 70% is collected and a mere 23% is processed or treated¹⁸⁶. Seven states in the country (Maharashtra, Uttar Pradesh, Tamil Nadu, Andhra Pradesh, Gujarat, Karnataka, and Delhi) produce close to 45% of MSW¹⁸⁷.
- India generates about 4.2 million tons of industrial waste per annum (CPCB).
- Of the three million small-scale enterprises, most are not using any pollution control equipment (CPCB).¹⁸⁸
- A 2015 WHO study revealed that in India, the number of rivers defined as 'polluted' doubled in the last five years.
- According to CPCB, India has an installed capacity to treat only 30% of its household waste, the remaining is either released into the open drains or dumped on the ground, leading to water pollution and related health issues.

These challenges present a large market for companies in the environment technologies space. As per the US Department of Commerce and International Trade Administration (ITA) Environmental Technologies Top Markets Report, India's environmental technologies market, including goods and services, was valued at \$16.3 billion in 2016¹⁸⁸. Municipal solid waste (MSW) is a promising sub-sector, expected to grow at 8-10% p.a., during 2015-2020, owing to the government's plans for setting up 500 engineered sanitary landfills facilities, provision for mechanized sweeping, and new emission standards for incineration. Tremendous opportunities also exist in the industrial water & wastewater systems, as companies in power, food & beverages, pharmaceutical, textile industries demand advanced treatment technologies such as reverse osmosis membranes, ion exchange, and electro dialysis. As per the ITA report, the industrial water & waste water systems sub-sector is anticipated to grow 13-15% p.a. during 2015-2020.¹⁹⁰

Owing to the varied nature of each category of waste (MSW, bio-medical, e-waste, etc.), requiring different technologies and disposal methods, companies have developed expertise in

respective sectors. A few known players in the segment include Attero Recycling, E.coli Waste Management (e-waste segment), Ramky Enviro, Jindal Group (MSW sector), Synergy Waste Management, and Earth Sense Recycle Work (bio-medical waste), etc. Some other known players operating in Indian market include BASIX Municipal Waste Venture, Concept Biotech, Eco Birdd Recycling, EcoCentric Management, UL Trust Solutions, UPL Environmental and Vulcan Waste Management. A growing number of angel investors are also

backing waste management startups in India, among them are Saahas Waste Management, Karma Recycling, and MobiTrash.

According to India's Planning Commission, the total capital investment required to upgrade India's water infrastructure will require an investment of \$126 billion over the next 20 years. The Planning Commission has also estimated that India's municipal solid waste management will require an investment of \$3.4 billion (of

which 40% will come from the Government of India (GoI), 21% from state governments and 39% from the private sector).¹⁹⁴ Further, the government has allocated ~\$3 billion for the Namami Gange Programme, towards cleaning and rejuvenation of the Ganga river.

There are various initiatives taken by private companies offering solutions for waste management:

- SPML Enviro, an integrated environment solution provider arm of Subhash Projects and Marketing Limited (SPML) provides solution in relation to collection, transportation & disposal of municipal / hazardous waste, segregation and recycling of municipal waste, construction & management of sanitary landfill, construction & operation of compost plant and waste to energy plant at the Delhi airport and Hyderabad Airport. The company has partnered with US-based PEAT International, a waste-to-resources company for the treatment and recycling of a range of waste feedstocks, including industrial, universal, and medical waste.
- HCL Info System has created the online process of e-waste recycling request registration, where customers (individual or corporate) can register their requests for disposal of their e-waste.
- ITC Ltd. has chosen environmental & waste management as one of the areas for their CSR efforts, including recovery of dry recyclable waste going to landfills, creating sustainable livelihoods for waste collectors, and participation in Swachh Bharat Mission.
- Recently, a Pune-based waste-to-energy solutions providing company Aspirify Energy acquired G.E.T. Water Solutions, a water-treatment-solutions firm to expand its capabilities in the liquid waste management segment, with the aim of leveraging opportunities created by Swachh Bharat Mission.

Regulatory landscape

Municipal solid waste: The MSW Rules were formulated in 2000, which defined the roles of municipal corporations, state governments, and the pollution control boards in management of solid waste. These rules were revised in 2016 wherein rules will be applicable beyond municipal areas, to include urban agglomerations, notified industrial townships, areas under the control of Indian Railways, airports, airbase, port and harbour, defence establishments, special economic zones, and State and Central government organizations. The new rules also place emphasis on integration of informal sector with the formal sector, and extend the responsibility of generators to segregate waste as wet (biodegradable), dry (plastic,

paper, metal, wood, etc.) and domestic hazardous (diapers, napkins, mosquito repellents, etc.) and hand it over to authorized rag-pickers/waste collectors/ local bodies.

Sanitation and environmental cleanliness:

The government's Swachh Bharat Mission focuses on eliminating open defecation, collection and scientific disposal/reuse/ recycling of municipal solid waste, and strengthening of urban local bodies to design, execute and operate systems.

Urban waste management: As part of Atal Mission for Rejuvenation and Urban Transformation (AMRUT), the government focusses on establishing infrastructure that could ensure adequate sewerage networks

and water supply for urban transformation. Further, clean water supply, sanitation, and efficient waste management are the important components of the government's Smart Cities Mission.

Electronic waste: In 2012, E-waste (management and handling) Rules 2011 made it mandatory for all electronic goods manufacturers to ensure that producers collect their 'end-of-life' products from consumers (industrial and individuals) and recycle them in environmentally safe manner. These rules were made more stringent in 2016, setting targets for producers for collection of such waste, making them responsible for handing over e-waste to recyclers.

Table 3: Applicable rules pertaining to various waste segments, including hazardous and bio-medical waste are mentioned in the table below, along with various government initiatives.

Year	Policy/Initiatives
1989	The Hazardous Waste (Management & Handling) Rules
1998	Bio-medical Waste Handling Rules, 1998
2000	MSW (Management & Handling) Rules, 2000
2006	Strategy and action plan-use of compost in cities
2008	National Urban Sanitation Policy
2009	Draft document on E-waste handling Rules
2010	National Mission on Sustainable Habitat
2011	Plastic Waste Rules, 2011
2012	E-waste Rules, 2011
2013	Draft Municipal Solid Waste Rules 2013
2014	Draft Manual on Municipal Solid Waste Management and Handling
2014	Swachh Bharat Mission
2015	Atal Mission for Rejuvenation and Urban Transformation (AMRUT)
2016	Solid Waste Management Rules (SWM) 2016, Plastic Waste Management Rules 2016, e-waste (Management) Rules 2016, Bio-Medical Waste Management Rules 2016, Construction and Demolition Waste Management Rules 2016, Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016

Source: Industrial and Urban waste management in India, The Energy and Resources Institute, 2015

Growth drivers for the industry

Growing urbanization and industrialization are two major reasons that are increasing pressure on environment, and will form the growth drivers for the waste management industry in India.

• Population growth and urbanization:

The 2011 census reported that of the 1.2 billion population in India, 377.1 million reside in urban areas. This figure is expected to rise to 600 million by 2031.¹⁸⁹ The rapid growth of urban dwellers is anticipated to further burden the country's waste management resources. As per The Energy and Resources Institute (TERI)'s 2015 report, by 2041, 114 million tons of municipal solid waste will be generated in India every year, resulting in per capita waste generation of 0.53 kg/day (rising from 0.36 kg/day in 2011), necessitating better waste management technologies.¹⁹⁰

- **Rate of industrialization:** The policy push for industrialization through liberalization of FDI norms, and campaigns such as Make in India have resulted in various companies entering India to set up their manufacturing bases. The present treatment capacity for industrial wastewater is 1/6th (142 MLD) of total generation.¹⁹²
- **Impact on health:** Increasing awareness of adverse health impacts such as respiratory concerns, and cardiovascular diseases, among others, because of Air pollution and water pollution (caused by unsanitary disposal of waste) has further highlighted the need to manage waste.
- **Thrust on urban waste management through recent initiatives:** The government is driving better urban waste management practices through awareness generation, policy thrust and programmatic interventions. Swachh

Bharat Mission (Clean India Mission) and Atal Mission for Rejuvenation and Urban Transformation (AMRUT) place emphasis on better management of industrial and household waste. Swachh Bharat Mission has put emphasis on 100% collection and scientific processing/disposal/reuse/recycling of municipal solid waste. The government is focusing on providing all support to municipal bodies to come up with design, execution and operation plans for waste disposal systems. There is also an emphasis on private-sector participation and public-private partnership (PPP) in capital expenditure, operation and maintenance of solid waste. The Sustainable Habitat Mission also has an important component on solid waste management.

- **Upsurge in technology adoption:** A study by ASSOCHAM revealed that of 1 billion phones in circulation in India, close to 25% end up in e-waste annually as

consumers frequently buy new phones to get access to the latest technology.¹⁹¹ Telecom equipment accounts for 12% of e-waste, the majority (70%) being accounted by computer equipment. Since a meagre 1.5% of total e-waste gets recycled in India due to inadequate infrastructure, tremendous opportunities exist for manufacturers and other players to participate in this space.

- **Stricter norms for industries:** The governments is placing emphasis on better waste management and stringent requirements on industries for compliance with environmental laws. For instance, in 2016, GoI notified new hazardous waste management rules wherein it banned the import of solid plastic waste including PET bottles to ensure that existing plastic waste in the country is used efficiently, for industrial purposes.¹⁹²

Role of Environmental Services as key services sector

The government allows 100% foreign direct investment under the automatic route for urban infrastructure areas including waste management subject to relevant rules and regulations. This opens various opportunities for foreign players and investors to collaborate with Indian players and explore the nascent Indian waste management industry.

- **International collaborations:** Global players can partner with both Indian private players as well as the government in PPP to create integrated solutions in various waste management areas like feasibility study, design and planning, technical consultations, waste treatment technologies, restructuring of existing waste collection systems, etc.
- **International investors:** Various fiscal incentives offered by the Government, can make the sector more attractive for the foreign investors. These include 100% tax deductions on gains and profits to companies that handle waste management projects; electricity taxes and excise duty with exemptions and concessions and waiver of customs duty on certain material imports meant for generating renewable energy.
- **Opportunities at collection of waste:** Collection of waste has significant employment generation potential. Rough estimates peg the number of informal waste scavengers at around 39 million.¹⁹²

Future prospects for the industry

Some of the international good practices have a replication potential in India's waste management landscape. For instance, in the Netherlands, Austria and UK, the bio-degradable waste management (BMW) systems focus on building separate

collection systems like specific bins which would eventually lead to BMW treatment systems. Some of the emerging opportunities in the sector are:

- **Participation in Waste-to-Energy (WtE) projects:** According to the Ministry of New and Renewable Energy (MNRE), if the current 62 million tons of MSW produced in India is dumped without treatment, the country would need 340,000 cubic meters of landfill space every day. Considering that this figure could go up to 114 million tons by 2041, there is an urgent need to look for alternative ways to utilize this waste. One of the solutions to this issue is converting this waste into energy. As per MNRE, there exists a potential to generate about 1700 MW of power from urban waste (1500 from MSW and 225 MW from sewage) and about 1300 MW from industrial waste. Per IREDA (Indian Renewable Energy Development Agency) estimates, so far India has realized only 2% of its WtE potential. To promote uptake, the MNRE is also providing subsidies and incentives for WtE projects. As per the Ministry of Urban Development (MoUD), about 21 WtE plants are under tendering stage across various states. Several Indian players have also entered this space, and are offering services to international clients as well.

Company	Operating regions
VA Tech Wabag	Europe, Africa, Asia, Middle East, Latin America
UPL Environmental Engineers Pvt Ltd	Germany, UK, Japan
Ramky Enviro Engineers Ltd	Singapore, Indonesia, Vietnam, Thailand, Middle East and North Africa
Mailhem Engineers Pvt Ltd	Pakistan, Nepal, Bangladesh
Attero Recycling	Plans to expand overseas

- **Opportunities under Smart Cities**

Mission: Efficient waste management is one of the important areas identified under the Smart Cities Mission as well. For instance, under the smart city development project, the Agra Municipal Corporation has formulated a plan wherein it will install 293,000 hi-tech dustbins which will be RFID-tagged.¹⁹³ These bins will be tracked through GPS-enabled garbage collection vehicles to ensure timely unloading of waste material. Such innovative models can be replicated in other cities as well.

- **Opportunities under Swachh Bharat**

Mission: The government targets to construct 6.6 million toilets in urban India, and over 100 million toilets in rural India by 2019, with an outlay of INR 620 billion (~\$ 9.3 billion) and INR 1340 billion (~\$20 billion), respectively. This will result in opportunities for health and hygiene companies, ceramic companies, and construction companies.

- **Participation in e-waste management:**

India is the fifth largest e-waste producer in the world, generating 1.8 million tons of e-waste each year, which is expected to rise to 5.2 million tons by 2030. Over 95% of e-waste is collected by the unorganized sector, leaving ample space for private players to enter the market.

Conclusion and recommendations

Waste management presents enormous opportunities in India as it brings a unique situation wherein issues of service quality and waste quantity need to be handled together. The government has made waste management a priority under several of its initiatives including Swachh Bharat Mission, Smart Cities Mission, AMRUT, and National Mission for Sustainable Habitat. The on-ground implementation of these plans will require a vast number of players in the market. India certainly requires newer delivery models, more sophisticated technology, newer designs, and better implementation practices to manage its waste, which can result in tremendous opportunities for investors and private firms.



14. Energy Services

Industry profile

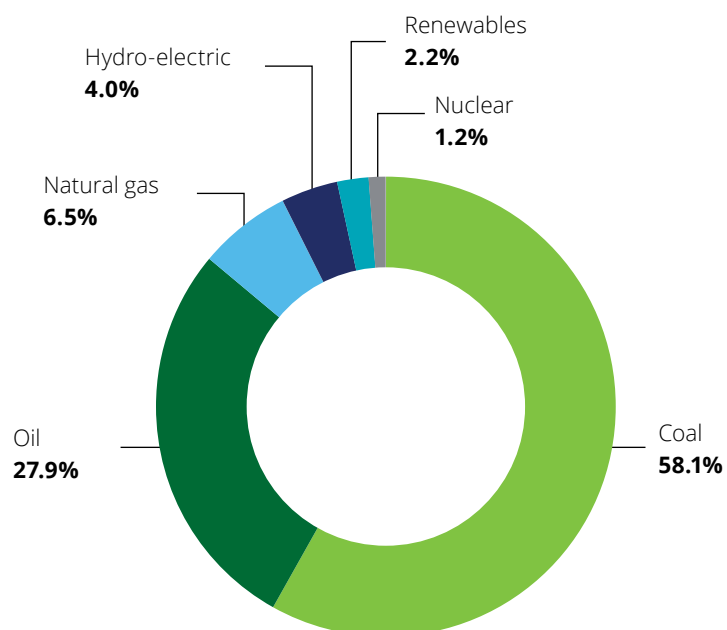


India is the third largest energy consumer in the world.

Its primary energy consumption rose by 5.2% as compared to global growth of 1% in 2015. Coal remains the dominant fuel, accounting for 58% of India's primary energy consumption. India's energy intensity (the amount of energy required per unit of GDP) declined by 2% in 2015, faster than the 10-year average of -1.4%.¹⁹⁴

Oil and gas sector

- India has 26 sedimentary basins covering an area of 3.14 million sq. km. (44% on land and 56% offshore).
- India imports over 81% of its crude oil requirements¹⁹⁵, and meets 45.7% of its gas requirements through imports.



Source: BP Statistical Review 2015

Table 4: Exploration and Production

	Reserves (FY2015)	Production	Remarks
Crude Oil	Proved oil reserves of 0.8 Thousand million tonnes (TMT)	41.2 MMT (FY2015)	India has proved oil reserves-to-production (R/P) of 18, as compared to world R/P ratio of 50.7
Natural Gas	Proved gas reserves of 52.6 Trillion Cubic Feet (TCF)	29.2 BCM (FY2015)	India has proved gas reserves-to-production (R/P) of 50.9, as compared to world R/P ratio of 52.8
Coal Bed Methane (CBM)	Prognosticated CBM resources of about 92 TCF (2,600 BCM) in 12 states of India ¹⁹⁶	367.5 MMSCM (Nov 2016)	Great Eastern Energy Corporation and Essar Oil have CBM-gas producing blocks in Raniganj, West Bengal.
Shale Gas & Oil	Recoverable shale gas resources of about 96 TCF	Oil and Natural Gas Corporation Limited (ONGC) has identified 17 potential shale oil and gas sites along the eastern and western coasts of India. ¹⁹⁷	
Gas Hydrates	933 TCF (Hydrate Energy International) ¹⁹⁸	Launched National Gas Hydrate Program (NGHP), along with the Ministry of Petroleum and Natural Gas (MoPNG), government institutes and Public Sector Undertaking (PSU) companies ^{199 200}	

Growth drivers for the sector

As part of International Energy Outlook 2016, EIA projects that India and China will account for about half of global energy demand growth through 2040, with India's energy demand growing at 3.2% per year. As per BP Energy Outlook 2016, India's energy consumption is projected to grow at 4.2% per annum up to 2035, faster than all major economies in the world²⁰¹. The key growth drivers are:

- Robust GDP Growth - India's economy has been growing consistently. The GDP growth rate has averaged at 6.9% annually in the past 5 years.²⁰²

- Focus on manufacturing through "Make in India" initiative – The government aims to increase manufacturing sector contribution from around 17% of GDP to 25% by 2022.²⁰³
- Reduce import dependency - The Hon'ble Prime Minister of India had outlined the vision to reduce import dependency to the extent of 10% from current level by 2022. The government had approved new Hydrocarbon Exploration and Licensing Policy (HELP), which will provide for a uniform licensing system for oil, gas, CBM etc., under a single licensing framework. Further, under the Discovered Small

Fields Policy, 67 Discovered Small Fields have been offered in 46 Contract areas through the new Revenue Sharing Model.^{204 205 206}

- Increase in E&P spend - Oil & Gas players including national oil companies have planned significant investments to increase oil and gas output from existing fields and also to develop new fields.

Refining, Transportation & Marketing**Table 5: Refining, Transportation & Marketing**

Sector	Network (FY2016)	Capacity (FY2016)
Pipeline network	<ul style="list-style-type: none"> • Total pipeline network: 42,486 Kms • Crude oil pipeline: 9,853 kms (9,365 kms onshore and 488 kms offshore) • Natural gas pipeline: 17,658 kms • Petroleum product pipeline: 14,975 kms 	<ul style="list-style-type: none"> • Crude oil pipeline: 140.5 MMT • Natural gas pipeline: 464.12 MMSCMD • Petroleum product pipeline: 97.7 MMT
LNG	<ul style="list-style-type: none"> • Four operational LNG regasification terminals at Hazira and Dahej (Gujarat); Kochi (Kerala); Dhabhol (Maharashtra) 	30 MMTPA (Sep 2016)

Sector	Current Status
Refining	<ul style="list-style-type: none"> India has 23 refineries, 18 in the PSU Sector, 3 in the private sector and 2 in joint venture. Domestic installed refinery capacity: 230.1 MMTPA (FY2016) Total refinery crude throughput: 232.86 MMT Refinery capacity utilization: 108.2%
Petroleum Products	<ul style="list-style-type: none"> Production: 231.9 MMT (FY2016) Consumption: 184.67 MMT (FY2016) High Speed Diesel (HSD) accounted for the largest share of production (47%) in the Indian refineries, followed by MS (Motor Spirit) at 17%.
Retail Outlets	<ul style="list-style-type: none"> As of October 2016, total of 57,393 retail outlets, 323 oil terminals/depots, 188 LPG Bottling plants, 18,214 LPG distributorships and 6,544 SKO/LDO Agencies. Indian Oil owns the maximum number of retail outlets in the country (about 44.7%), followed by HPCL (24.4%) and BPCL (24%); private firms own the remaining.
City Gas Distribution (CGD)	<ul style="list-style-type: none"> CGD sector comprises of Compressed Natural Gas (CNG) and Piped Natural Gas (PNG). As of Sep 2016, India had 20 CNG companies operating about 1,167 CNG stations across 12 states. As of April 2016, the total number of PNG connections stood at 31,63,588. In November 2016, the MoPNG announced eighth round of CGD bidding covering 8 geographical areas in Haryana, Goa, Puducherry, UP and Maharashtra.²⁰⁷
Strategic Reserves	<ul style="list-style-type: none"> The government will set up two strategic oil storages at Chandikhol (Orissa), Bikaner (Rajasthan) with a combined storage capacity of 10 MMT to enhance oil security and protect supply disruptions. India has signed a deal with Abu Dhabi National Oil Co (ADNOC) to fill half of an underground crude oil storage facility at Mangalore, Karnataka.^{208 209 210}

Growth drivers for the sector

India aims to increase the share of natural gas in its energy mix from 6.5% to 15% by 2020-21. To achieve this, India plans more than double its LNG import capacity to 50 MT in the next few years by setting up new LNG Terminals in the country.^{211 212 213}

- Gas transmission pipelines using Viability Gap Funding (VGF) - The Cabinet Committee on Economic Affairs had approved the VGF of \$1.93 billion for natural gas pipeline from Jagdishpur to Haldia and Bokaro to Dhamra (JHBDPL). This will develop gas network in the eastern region of India, which has limited gas pipeline network currently.
- Growing CGD network - PNGRB has authorised total 75 geographical areas as of FY17.²¹⁴

- In November 2016, the MoPNG announced eighth round of CGD covering eight geographical areas.²¹⁵ As of March 2017, India had 21 CNG companies operating about 1,197 CNG stations across 13 states in India.²¹⁶
- Focus on clean fuels – India has made huge commitment as a part of COP-21 to reduce energy intensity in the economy.
- Assisting implementation - The government has accorded CGD network the status of public utility. This will allow the CGD system to increase its reach and make it comparatively easier to secure government licences and clearances.²¹⁷
- The government has in-principle approved the decks for use of LNG as an auto fuel. The draft norms for LNG application in road vehicles will be ready in FY2018.²¹⁸

- India is looking to merge its existing state-owned oil and gas companies to create a new company with a large balance sheet which will look for acquiring strategic assets globally particularly in the upstream segment.²¹⁹

Refining

- The government plans to roll out BS-IV auto-fuels by 1 April 2017 and leapfrog into BS-VI auto-fuels w.e.f. 1 April 2020, which would facilitate major investment in refinery upgradation, auto industry, related manufacturing and services sector.
- The government has implemented Ethanol Blended Petrol (EBP) Programme under which, oil companies will sell ethanol blended petrol with ethanol percentage of up to 10%. Further, the Bio-diesel Programme, permits the sale

of Bio-diesel (B100) by private players to bulk consumers such as Railways and State Transport Corporations.²²⁰

- MoPNG constituted a Steering Committee to implement the 'Make in India' campaign in oil and gas sector. Oil PSUs have formulated INDEG (Indigenisation Group) to increase the domestic component in all kinds of oil procurements.²²¹
- Under the Start-up India Mission, Oil India and ONGC have announced INR 500 million and INR 1 billion start-up fund to foster and incubate new ideas related to oil and gas sector.²²²
- Under the Skill Development Initiative, oil & gas PSUs are setting up 6 Skill Development Institutes (SDIs) in the country. MoPNG, through Oil Industry Development Board (OIDB), has set up Hydrogen Sector Skill Council (HSSC) for oil & gas sector.²²³

Opportunities in the oil and gas sector

01. Exploration & Production

Oilfield service providers have the opportunity to provide services in the areas of drilling & oilfield services. Companies provide seismic services such as surveying, interpreting and ascertaining the reservoir geology and other drilling-related services such as directional drilling and mud logging; onsite engineering, operational & maintenance services, manpower supply services; and those providing drilling mud, transporting oil/gas from the reservoirs to the refinery, compliance services (with Engineering standards) etc.

02. Refining, LNG and Pipeline Transportation

Companies have opportunities in the areas of EPCM services, technology solutions, industrial technical inspection services; asset integrity management services; corrosion services; technical staffing & training services; hazardous areas testing

& certification services; petroleum testing, refining and distribution services; engineering software solutions, compliance services (with Engineering standards) etc.

03. Global Delivery Centers (GDC) of EPCM companies, Oilfield Services Companies and International Oil Companies in India

(GDCs providing EPCM services, R&D services, information technology services, finance/business support services).

Electricity Services

- Power sector has witnessed significant private sector participation, skewed heavily towards generation sector.

- Total installed capacity has grown at 9% per annum from 132 GW in FY2007 to 315 GW in FY2017 (up to Jan). Capacity addition has been driven by private sector investing heavily in coal and renewables based generation capacity. Private sector is responsible for 64% of the total capacity addition of 182 GW since FY2007. As a result, the share of the private sector has increased from 13% of installed capacity to 43%.
- Transmission & distribution remain largely in the public sector, with a few notable exceptions. Capacity addition has been seen in transmission and distribution as well, with PowerGrid alone capitalizing approximately 320,000 million (\$4,740.7 million) of projects in FY2016.

Figure 44: India – Generation Capacity by type

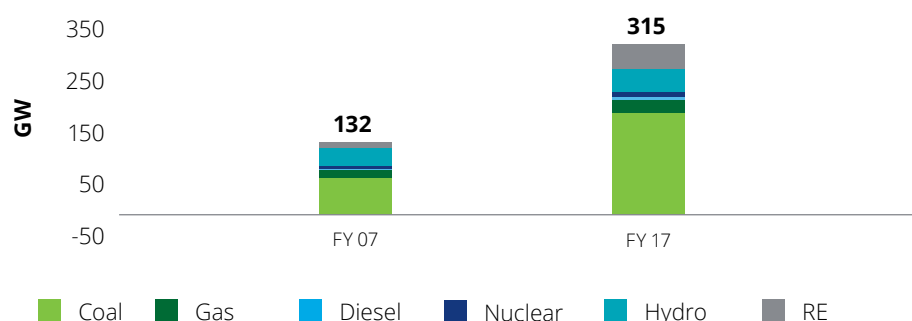


Figure 45: India – Generation Capacity by entity

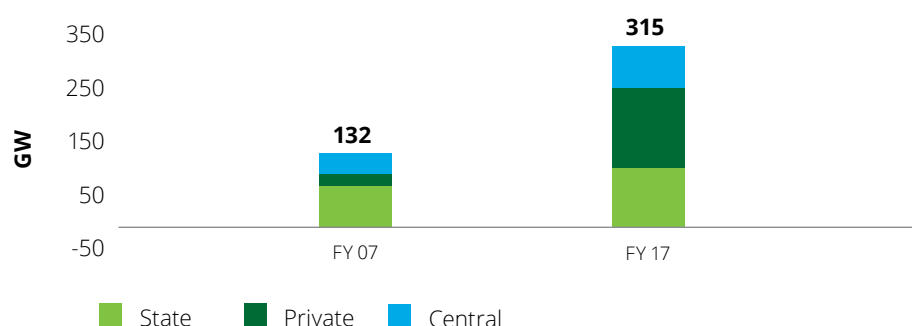
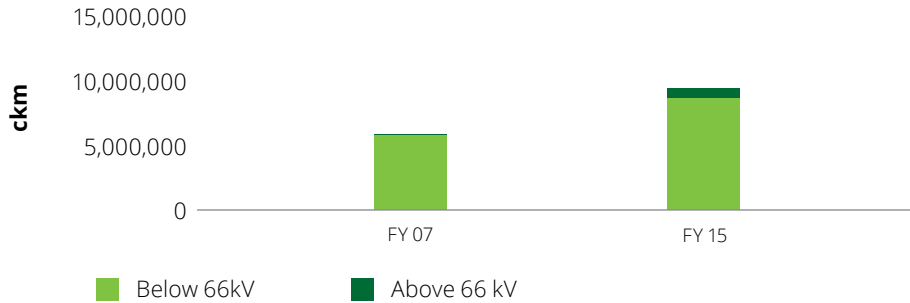
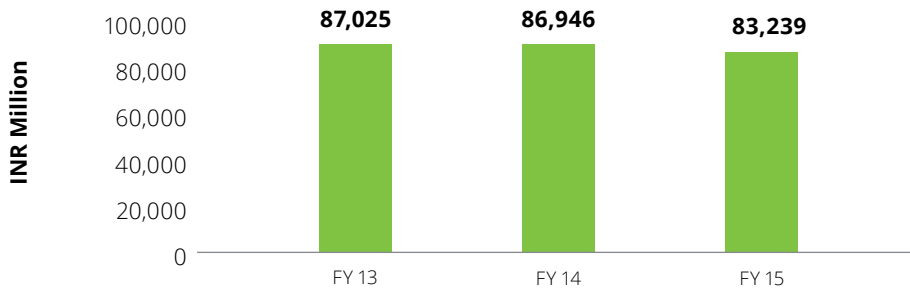


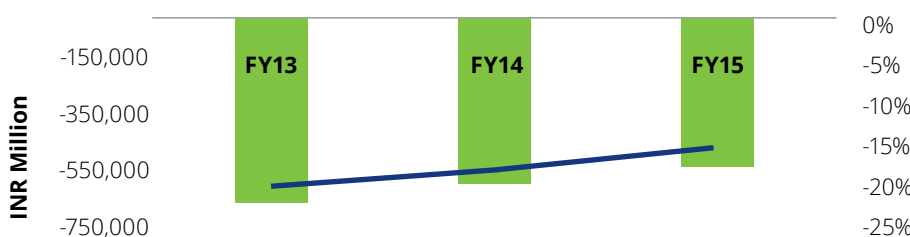
Figure 46: India – Total Transmission Line Length**Figure 47: India – State Sector Capex**

Source: Deloitte Analysis

Growth drivers and future prospects

- With the significant capacity additions, enhanced fuel availability and moderated demand profile, India is expected to have a demand and energy surplus during FY2017. However, as access is progressively enhanced and economic activity picks up pace, continued enhancement of capacity across generation, transmission and distribution will be required to meet expected demand.

- Poor financial health of the distribution sector, especially in a few key states, is a significant hurdle to continued development of the sector and proactive measures like UDAY, IPDS and DDUGJY have been rolled out to address the challenges.

Figure 48: India – Power Sector Losses (INR million)

Source: Deloitte Analysis

- India has set an ambitious target of generating 175 GW of power from renewables by 2022, which will include 100 GW of Solar power, 60 GW from wind power, 10 GW from biomass power and 5 GW from small hydro power.²²⁴
- The government has approved the Ujwal DISCOM Assurance Yojna or UDAY, which provides for the financial turnaround and revival of Power Distribution companies (DISCOM).²²⁵ As of date, 22 states have come under UDAY and power tariff orders for 2016-17 have been issued in 18 states.²²⁶
- The Government has set target to achieve 100 GW of Solar power by 2022. To promote investments in this sector, the key initiatives include exemption from excise duties and concession on import duties on components and equipment and 10-year tax holiday for solar power projects. It is also providing special incentives for exports from India in renewable energy technology under renewable energy sector specific SEZ.²²⁷
- In February 2017, India's solar power sector recorded low-winning bids of INR 2.97 per kilowatt-hour (kWh) to build 750 MW plant at Rewa in Madhya Pradesh. The low tariff—primarily due to low cost of financing the project—has made solar energy a competitive source of energy.
- India and France launched a \$1 trillion programme to help members of the International Solar Alliance (ISA) countries harness their solar resources.²²⁸
- The total hydro power generation capacity above 25 MW capacity in India (as on February 2017) was at 44,413.42 MW. The government is taking initiatives to restart the 20 stalled hydro power projects totaling 6,329 MW. It has also sanctioned the proposal regarding basin-wise reassessment of hydro potential in the country.²²⁹

Potential for global expansion

- India and Russia have agreed to explore building a gas pipeline to transport natural gas from Siberia.²³⁰
- India and the UAE have signed MoU in the field of energy management and conservation.²³¹
- In terms of LNG import, India buys 7.5 MMTPA of LNG from Qatar. It expects to commence a 3.5 MMTPA LNG contract with Sabine Pass Liquefaction Terminal in the US in 2017.²³²
- India supplies 500 MW of power to Bangladesh since 2013²³³. Further, India is set to invest \$11 billion in Bangladesh power, LNG and port sectors.²³⁴
- India and Nepal have joined hands to build new cross-border power transmission lines.²³⁵

Conclusion and recommendations

- India's crude oil production declined by 1.36% to 36.95 MMT in FY2016, as against 37.46 MMT in FY2014-15, mainly due to shortfall of production in Mumbai asset, natural decline of mature fields and less than envisaged production from new and marginal fields.
 - Oil and gas companies have increased focus on production optimization in mature fields. Further, they are implementing Enhanced Oil Recovery (EOR) and Improved Oil Recovery

(IOR) techniques to improve the average recovery rates. Oil field service providers can provide advanced technologies to help companies to enhance oil and gas production.²³⁶

- India has announced an Open Acreage Licensing Policy (OALP) for oil and gas exploration which will allow operators to select areas where they want to drill. India will conduct auction of hydrocarbon blocks under OALP twice a year. The first round is likely to occur in July 2017.
 - OALP will allow pricing and marketing freedom to operators and shift to a revenue sharing model. It will give an option for companies to select exploration areas based on the data provided by Directorate-General of Hydrocarbons in a National Data Repository.
 - It will provide opportunity for oil field service companies to analyse seismic and geophysical data and provide more information about prospective hydrocarbon blocks.²³⁷
- Power transmission & distribution remain largely in the public sector, which typically houses most of the required capabilities and skills within the organization.
 - Demand for consulting services during the development phase is subdued but growing. In the operations phase, there is demand for consulting services in capacity building (non-technical), regulatory compliance and

IT implementation. The demand for operations and maintenance, metering and data management services is expected to grow.

- Retail supply remains bundled with the distribution function
 - In this scenario, and when shortages materialize again, the demand for ESCO services to bring in efficiencies across the consumer base and possibly, demand response models is expected to materialize. When retail supply is unbundled to bring in competition at the consumer interface, it is expected that there will be a demand for consulting services in business structuring, legal and financial aspects.
 - In operations, there is demand for customer relationship management, automated meter reading data management and bill collection services.
- With increasing grid penetration of renewable energy generators, grid integration of intermittent generation whilst maintaining grid security has become a challenge.
 - The demand for generation forecasting to ensure adherence to schedules is expected to grow. Further, analytics for production optimization and applied research in generation technology and storage is expected to grow.

Table 6: Services in Power Sector

	Generation	Transmission	Distribution	Retail supply	Renewable Energy
Capex phase	– Consulting: engineering, legal, financial, business opportunities	– Consulting: engineering, legal, financial, business opportunities	– Consulting: engineering, legal, financial, business opportunities	– Consulting: engineering, legal, financial, business opportunities	– Consulting: engineering, legal, financial, business opportunities
Operations phase	– O&M of assets	– Consulting: capacity building, regulatory compliance, IT implementation – O&M of assets – Metering & data management	– Consulting – capacity building, regulatory compliance, IT implementation – O&M of assets – Metering & data management	– CRM, AMR data management, bill collection, ESCO	– Generation forecasting, analytics for production optimization, R&D on generation tech & storage – O&M of assets

15. Space

Industry profile

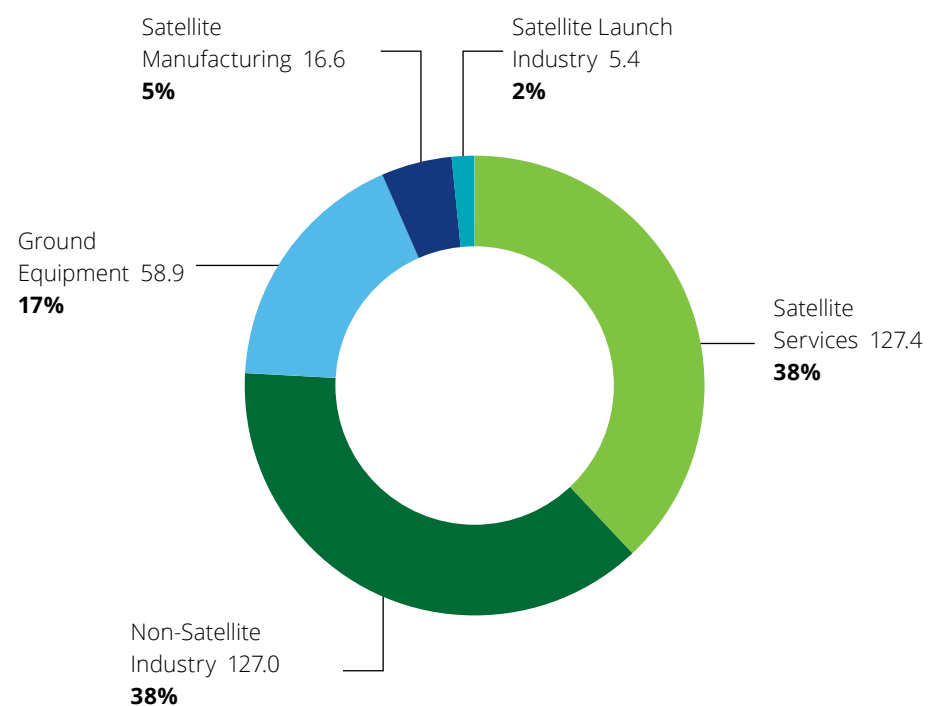


Global space industry is valued at \$335 billion in 2015 of which the satellite industry accounts for 62% \$208 billion²³⁸ and includes satellite services, satellite launch services, satellite manufacturing and ground equipment.²³⁹

India's Department of Space (DoS) has the primary responsibility of promoting the development of space science, satellite, technology and applications for development of national space infrastructure while the Indian Space Research Organisation (ISRO), a government institution under the DoS, has piloted all Indian activities in the space sector since its inception in 1969²⁴⁰. Some of the initiatives successfully taken up by ISRO are:

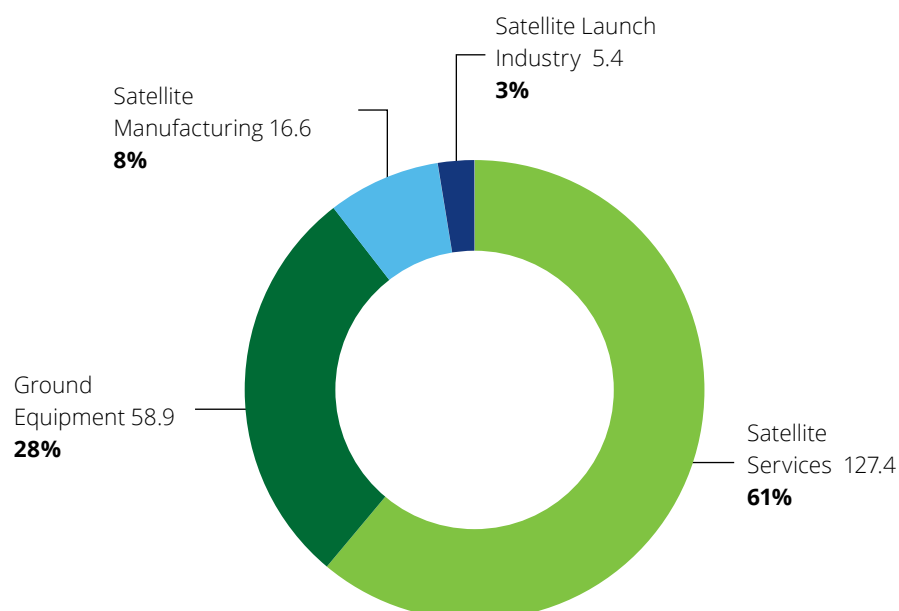
- Launched 87 spacecraft missions (including 2 Nano Satellites)
- Exhibited 60 launch missions (including Scramjet-TD and RLV-TD) and 2 re-entry missions
- Launched 8 student satellites

Figure 49: Global Space Industry (2015, US\$335.3 billion)



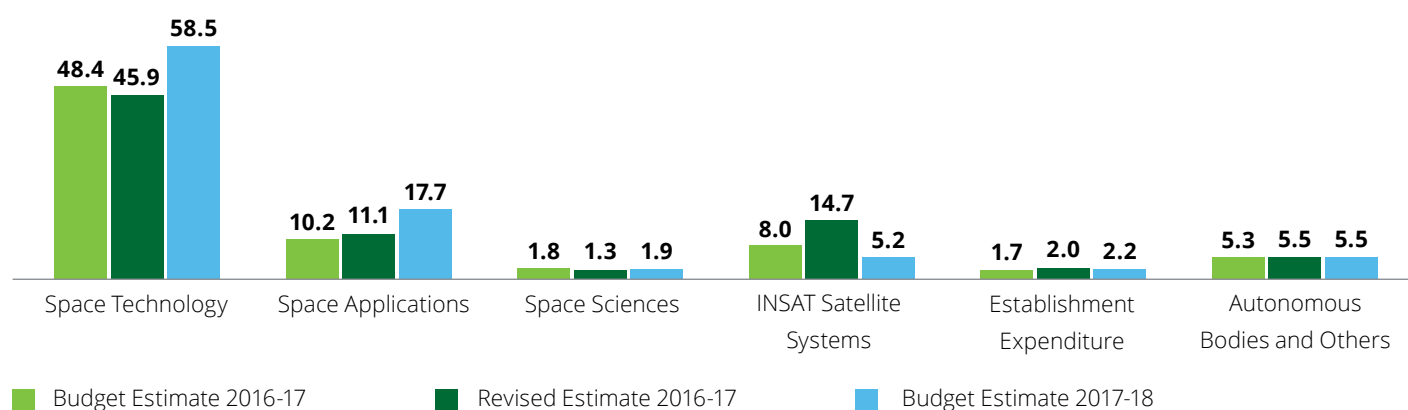
Source: Satellite Industry Report, June 2016v

Figure 50: Global Satellite Market (2015, US\$208.3 billion)



Source: Satellite Industry Report, June 2016v

Figure 51: India's space sector budget (INR billion)



Source: India Budget 2017-18

As a part of the government's 12th Five Year Plan 2012-2017, ISRO has submitted a plan for 58 space missions to be undertaken, which includes 33 satellite missions and 25 launch vehicle missions²⁴¹.

- Between 2012 and 2016, ISRO has been able to launch a total of 52 space missions (meeting 90% of its planned 5-year target), including 26 satellite missions and 26 launch vehicle missions.

- The provisional financial resource requirements for the missions as well as for advance investments for the realisation of missions during the early phase of 13th Five Year Plan has been set at INR 550 billion (\$8.4 billion) at (2011-12) prices^{242 243}.
- The government has increased its Space Budget estimate FY2017-18 by more than 20%, to INR 90.94 billion (\$1.35 billion). It will provide initial funding for

two new ambitious Indian space science missions—one to Mars and another to Venus²⁴².

- India has been launching satellites for foreign countries for over 15 years. It has well established itself as a committed player in the commercial satellite market.
- The country has become a preferred destination for foreign satellite launches, given the significant difference in costs. Many countries are keen to launch

their satellites through ISRO owing to its excellent track record and low-cost satellite launch services.

- Cost of satellite launches in India are nearly 30 to 40% lower compared to other countries.
- Low-costs are primarily due to lower wages, lesser cost of parts and production, and small payload sizes.
- India has also developed expertise in multiple launch technology using a single rocket.

India is currently working on a Unified Launch Vehicle (ULV), which will eventually replace Geo-Synchronous Satellite Launch Vehicle (GSLV) and Polar Satellite Launch Vehicle (PSLV). ULV will have the capacity to launch 15,000 kg into low earth orbit (LEO).

The Indian satellite industry includes satellite services such as **satellite launch services, satellite manufacturing & fabrication** and ground equipment related to **data management** and analysis.

Satellite launch services

- Antrix, the commercial arm of ISRO, is the nodal agency for providing satellite Launch services for customer satellites, on-board ISRO's operational launch vehicles namely, PSLV and GSLV.²⁴⁵ In FY2016, Antrix earned a revenue of approximately INR 2,300 million (\$35.17 million) through commercial launch services, which is about 0.6% of the global launch services market.
- For launching foreign satellites, a third launcher of higher payload capacity, GSLV Mk – III is being developed and has been tested successfully. It is expected to take its first flight during Q1 2017^{246 247}.
- In February 2017, ISRO launched a record of 104 satellites, taking its tally of foreign satellites launched to date to 180. The latest launch comprised three of its own, while the remaining 101 were from six countries: US, Israel, Switzerland, Netherlands, UAE, and Kazakhstan^{248 249}.

Opportunities

New launches, launch order book and space station

- Following the launch of 104 satellites, ISRO plans to take two Google Lunar Xprize contenders to the moon on the same PSLV and drive missions to Mars and Venus.
- Currently, India has satellite order book of around INR 2,800 million (\$42.8 million) for third parties, which will take it around 2-3 years to exhaust.²⁵⁰
- The country is also in discussions for contract manufacturing of meteorological satellites with other countries along with Indian industry.
- ISRO also awaits government approval for building its own space station.^{251 252}

Satellite fabrication services

- ISRO Satellite Centre (ISAC), Bengaluru, is the lead centre of ISRO for design, development, fabrication and testing of all Indian made satellites. ISRO has standardized design of major satellite subsystems in telemetry, tele-command, power, control systems, structural systems, spacecraft mechanisms, etc. It has outsourced fabrication and testing activities to several approved players²⁵³ and envisages to enhance industry participation towards production of subsystems, including component procurement, fabrication, package assembly and testing.
- ISRO also has a list of approved vendors which provide satellite sub-systems fabrication, testing, components and design services such as Transpace Technologies²⁵⁴, Alpha Design Technologies Private Ltd., Avasara Technologies, L&T and Godrej and Dhruva Space, etc.

Opportunities

Consortiums for production of satellites and launch vehicles

ISRO has floated industry consortiums for the production of PSLVs and Indian Regional Navigation Satellite System (INRSS) satellites. ISRO has also outsourced the manufacturing of two navigation satellites, Navic to a consortium of private firms. The consortium will have private sector expertise in each segment such as electrical, software and others, required for building a satellite^{255 256}.

Private sector opportunities in satellite manufacturing

ISRO has invited private sector companies to participate in satellite manufacturing. So far, private companies have only been supplying satellite components.²⁵⁷ Further, ISRO has announced to develop a 100-acre hi-tech Space Park in Bengaluru, where the private players will set up facilities to make subsystems and components for satellites. The opening up of the high profile satellite manufacturing sector is a part of the "Make in India" initiative.²⁵⁸

Opportunities for large industrial manufacturers

ISRO is roping large industrial manufacturers to create engines, stages of rockets, propellant tanks, solar panels, thermal control systems and electronics packages required for satellites and launch vehicles. Further, ISRO is currently in the process of developing a semi-cryogenic engine. This will require indigenous development of 35 materials and 22 coating processes. Indian industries will help fabricate the hardware for the engine subsystems.²⁵⁹

Satellite data

- **National Remote Sensing Centre (NRSC)** at Hyderabad is responsible for remote sensing satellite data acquisition and processing, data dissemination, aerial remote sensing and decision support for disaster management. Further, **Regional Remote Sensing Centres (RRSCs)** support remote sensing tasks specific to their regions as well as at the national level.
- **The Indian Institute of Remote Sensing (IIRS)** provides capacity building in Remote Sensing and Geo-informatics through education and training programmes^{260 261}.
- As part of space cooperation between India and Association of South East Asian Nations (ASEAN), ISRO, is also working towards the establishment of a **Satellite Tracking & Data Reception Station and Data Processing Facility** in Vietnam for ASEAN Member countries. This facility is aims to acquire and process Indian Remote Sensing Satellite data pertaining to ASEAN region and disseminate to ASEAN Member countries.
- Various Indian companies provide

satellite remote sensing, Geographical Information Systems (GIS), Space Management and Data Analysis services to ISRO as well as to foreign space stations.

Opportunities
BRICS to share data from remote sensing satellites

BRICS nations have agreed to share spatial data on natural resources from their remote-sensing satellites for optimum utilisation of space assets. The initiative will bring developing nations under the umbrella of space, opening possibilities of using excess capacities in the satellites. Going forward, the space agencies of the BRICS nations will share similar data for tele-education, tele-medicine, and a host of societal applications for mutual benefit.²⁶²

Growing NewSpace phenomenon

NewSpace is a worldwide phenomenon of enterprises expanding capacity and capability to develop space products and service using private funding. It is challenging the traditional ways of space services which have been otherwise considered expensive and time-consuming. Enabling NewSpace in India will impact

not only start-ups, but also provides an opportunity for SMEs to leverage cluster-based externalities such as technologies, infrastructure and manpower to build space-based services.²⁶³

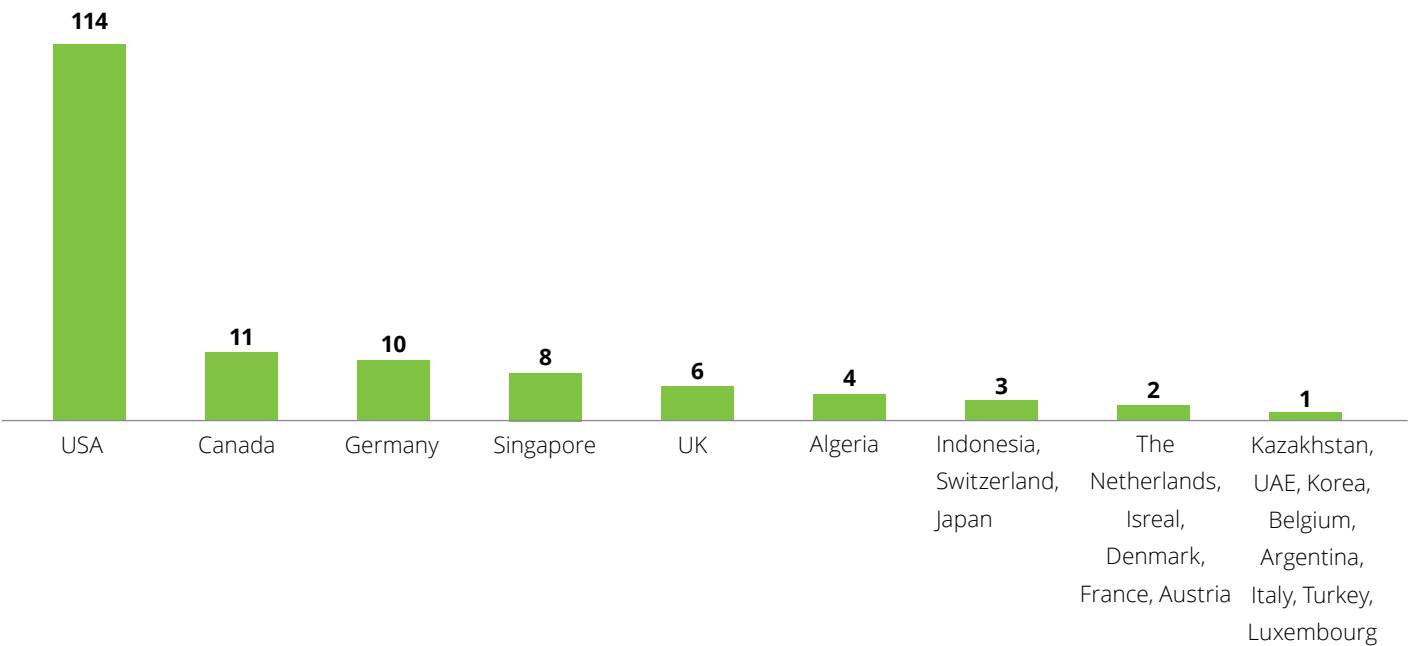
National Optical Fibre Network (NOFN) plan

The Government is pursuing the National Optical Fibre Network (NOFN) plan of connecting the Gram Panchayats (GP) in the country through the optical fibre cable (OFC). Recently, OFCs in 76,728 GPs and optical fibre in 64,599 GPs have been laid which allows significant room for satellites to contribute to Digital India.

Potential for global expansion

- India holds potential for global expansion across several countries such as the US, UK, Canada Germany, France, Korea, and Middle East.
- As of date, ISRO has successfully launched 180 foreign satellites for 23 countries.²⁶⁴ The US accounts for the largest share of satellite launches, followed by Canada and Germany.

Figure 52: Foreign satellites launched by ISRO



Source: ISRO

Conclusion and recommendations

- The government should encourage private players in the industry to develop capacity and capability in pursuing space activities for future technology development.
- There is a need to promote and develop a model for promotion of SMEs to capture a larger share in the international space market. The government could consider instituting a national fund for promotion of entrepreneurship in the space industry.
- India expects development of allied technologies such as composites technology to play a vital role in the future demand of space tourism and space habitat due to its lightweight and better performance. Further, electronics and data analytics industry will grow leading to enhanced collaborations in the space industry.²⁶⁵
- India could replicate the built-up of Bangalore as an IT hub for the space industry as well. Dedicated land should be allocated for space ventures and assistance should be provided to them in the start-up stage. Additionally, senior ISRO and Antrix officers can mentor the start-ups in space industry to ensure they operate within the Indian space policy framework and leverage technical expertise to ISRO.
- India is enhancing focus on NewSpace companies which are building B2B and B2C models which can scale both nationally and internationally. The B2B, B2C ecosystem in the space industry has the potential of tapping the IT infrastructure and extending it to core software-based applications of space-based information such as Geographical Information Systems (GIS). The government support in NewSpace is required to further catalyse the multiplier effect while steps are being taken to upgrade the existing capacity of the space industry.
- Further, India needs to focus on setting ground rules for international space cooperation with respect to other countries such as the USA, China and Russia. Unregulated international cooperation can spur regional and international insecurities.
- India can look forward to set up an independent space activities focused think tank constituting distinguished experts in the space field. The think tank will provide key insights on space program management, dual-use of technologies, economic impacts of space expenditures, new space laws, and insights on international cooperative space agreements.^{266 267}



16. Railway Services

Industry profile

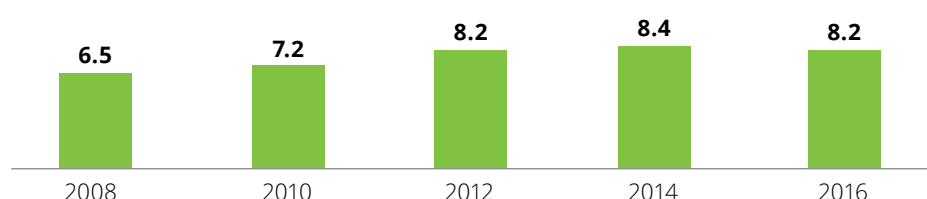


The Indian Railways is the largest employer in the country, employing 1.4 million persons (as of December 2016). It is also the fourth largest rail network after the US, Russia, and China. The 108,706-km network facilitates movement of 12,617 passenger trains. It has 6,853 stations, 240,000 wagons, 63,045 coaches, and 10,773 locomotives.²⁶⁸

Railways services is split into passenger services and freight services. The passenger traffic stood at 8.2 billion in 2015-16, while freight traffic stood at 1.1 billion tons during this period.²⁶⁹ Freight remains the major revenue earning segment for the Indian Railways, accounting for more than 67% of total revenues in 2015-16. The gross revenue of Indian Railways stood at INR 1,687.7 billion (\$25.2 billion), and is expected to reach INR 2,981 billion (\$44.5 billion) by 2019-20.²⁷⁰

The government has been investing heavily to upgrade railway infrastructure. The Union Budget 2017-18 allocated INR 1.3 trillion (\$19.7 billion) for capital and development expenditure of Railways.²⁷¹ The budget envisaged enactment of a new Metro Rail Act to facilitate greater private

Figure 53 : Trends in Passenger volumes (in billion)



Source: : Ministry of Railways

participation, establishment of a Rashtriya Rail Sanraksha Kosh to ensure passenger safety, and elimination of unmanned level crossing on broad gauge lines by 2020. It focussed on rejuvenation of the railway network through commissioning of 3,500 km of railway lines in 2017-18, redevelopment of at least 25 stations in 2017-18, installation of bio-toilets in all coaches by 2019, and feeding of about 7,000 stations with solar power in the medium-term.

The Railways is also encouraging private players to participate in rail projects through policy initiatives such as, Participative models for rail connectivity

and capacity augmentation, and Foreign Rail Technology Cooperation scheme. The Railways has identified 17 sectors in its operations to allow 100% foreign/private investment including high speed railway, freight corridors, suburban lines, standalone passenger lines (hill railways), passenger terminals, bio-toilets, technological solutions for unmanned level-crossings, mechanized laundries, testing facilities, and construction of bridges.

Further, the government has partnered with foreign governments to aid modernization of the Railways:

- Indian Railway Station Development Corporation, in cooperation with China Railway Construction Engineering Group, will be developing New Bhubaneswar and Baiyappanahalli stations.
- Indian Railways will form a joint venture with the Belgium government to develop and modernize the Mumbai Central, Jammu, Jaipur and Varanasi railway stations to make them into commercial hubs.
- South Korea has come forward to redevelop the New Delhi railway station, one of the busiest terminals in the country, as a world-class facility.
- French Railways is assisting its Indian counterpart in upgrading the track between Delhi-Chandigarh to facilitate running of trains at a maximum speed of 220 km per hour.

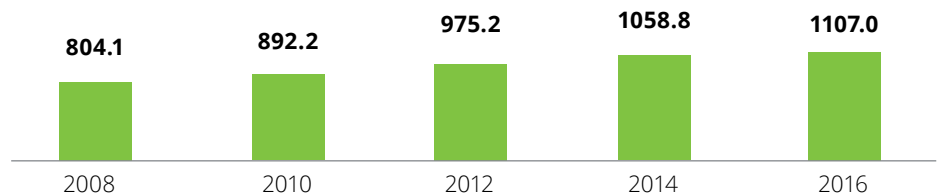
Growth drivers for the industry

- **Growth in passenger traffic:** The passenger traffic is expected to grow to 15.2 billion by 2020, from 8.2 billion in 2016²⁷². Urban population in India as a percentage of total population, grew to 33% of total population in 2015 (from 31% in 2010), leading to surge in passenger traffic between urban and rural areas. Additionally, rising income levels have made rail travel affordable to a large number of Indian population leading to a rise in passenger movement from rail.
- **Growth in freight traffic:** Increasing levels of industrialization across the country is expected to increase freight traffic, which is estimated to grow to 2.2 billion tons by 2020, from 1.1 billion tons in 2016²⁷². Freight traffic via Dedicated Freight Corridor (DFC) is also anticipated to grow at a CAGR of 5.4% to reach 182 million tons in 2021–22, from 140 million tons in 2016–17.
- **Rise in demand for mass transit systems:** Metro rail projects are being envisaged across many cities over the next ten years, and an investment of \$137 billion is expected in metro rail networks by 2020²⁷².

Role of Railway Services as key services sector

Indian Railways is planning to launch an integrated mobile application for availing all travel-related services such as hiring taxis, pre-ordering a meal, requesting for porter services, lodging at a retiring room etc. According to railways, there will be a requirement of nearly 10,000 skilled

Figure 54 : Trends in freight traffic (Million tonnes)



Source : Ministry of Railways

personnel to operate bullet trains and other high speed trains being developed in the country. Indian Railways is expected to generate employment of 140 million man-days in 2018-19²⁷³. According to Department of Industrial Policy & Promotion (DIPP), FDI inflows into railways related components from April 2000 to March 2016 stood at INR 47.6 billion (\$710.9 million).²⁷²

- **Emerging opportunities:** Indian Railways is among the biggest suppliers of equipment including locomotives and coaches to smaller nations in Africa, such as Benin, Angola, Tanzania, Mozambique, and Senegal. The Indian Railways is also making plans to sell rail wheels to South Africa, a developed economy with a well-equipped railway system. RITES (a public sector undertaking under India's Railway Ministry) recently exported 60 AC coaches to Bangladesh. It had also bagged a contract for the supply of 18 MG diesel electric locomotives to Myanmar Railways. Players such as Korea's Hyundai Rotem and Bombardier Inc., are also planning to export from India.

- **Construction related services:** Indian Railway Construction Co Ltd (IRCON), Rail India Technical and Economic Services (RITES) and Power Grid Corporation of India Ltd (PGCIL) are coming together to reduce carbon footprint by electrifying 24,000 km of railway tracks over the next five years. Currently, about 2,000 km track is being electrified per year and the aim is to reach 4,000 km per year by 2017-18 and 6,000 km in the subsequent year. Through electrification, trains will run faster, reducing the energy bill considerably and less emission of carbon.

Potential for global expansion

Export share of Indian Railways is just 2% of the total world market of \$175 billion. There is a significant potential in rolling stock and infrastructure services in the countries of Africa, South America, Middle East, South East Asia, and CIS countries, where India can play major role in tapping this opportunity. Indian railways can leverage its strength in R&D, services and IT capabilities to gain entry in the world market by participation in railway oriented trade fairs and exhibition.

Future prospects for the industry

Indian Railways has plans to modernize its railway infrastructure, and for that it seeks to modernize its railway stations in a way that would place them at par with the best transit hubs in the world.

- **Operation and maintenance services:** Several Indian players have been involved in operations and maintenance of railway services. For instance, Larsen & Toubro bagged the contract for construction of sections of Mukundpur-Lajpat Nagar line for Delhi Metro; Kalindee-VNC joint venture was awarded the contract for commissioning of sections of Janakpuri West-Kalindi Kunj and Central Secretariat-Kashmere gate line for Delhi Metro. Indian players can also explore opportunities for export of train sets and other related equipment in Bangladesh, Myanmar, Sri Lanka, Mozambique and other African countries, where RITES is already an established player.
- **Technology and analytics:** The Railways plans to use drones and geospatial satellite technology to remotely review the progress of major projects. Union Budget 2016-17 mentioned digital analytics as one of the focus areas, with the government planning to set up a Special Unit for Transportation Research and Analytics (Sutra) to analyze the data collected by the national carrier, to gain business insights.
- **Dedicated freight corridor:** Dedicated Freight Corridor Corporation of India (DFCCIL) – a Special Purpose Vehicle under the aegis of Ministry of Railways- is constructing Dedicated Freight Corridor (DFC) along the Eastern (1,856 km route length) and Western (1,504 km route length) parts of India, to enhance punctuality of freight trains, for which it signed contracts worth INR 350 billion (\$5.2 billion) as of November 2016. It is also looking at enhancement of the speed of all Express trains on the Diamond Quadrilateral High Speed Rail Network.

- **Integrated ticketing system:** The railways is looking to move towards a cashless ticketing system by installing 6,000 point-of-sale machines and 1,000 ticket vending machines across its network. An integrated ticketing system such as use of multi-purpose card for electronic payment across multiple modes of transport will simplify the ticket procurement process for passengers. It also has plans to launch an integrated mobile app through which the consumers can access all travel-related services including ticketing, hiring cabs and porters.
- **Opportunities in mass transit:** The government is encouraging cities with a population of 2 million and above to develop mass transit systems, including metro, monorail and light-rail systems. Around 50 cities in India are expected to have a population of over 2 million by 2050, creating abundant opportunities for players in coach manufacturing, track maintenance, signaling and electrification, ticketing and other support services.
- **Station redevelopment:** Focus on station redevelopment projects will open up opportunities for private developers as well as for consultancy services.
- **Advisory services:** The Indian Railways is looking for advisory services in a range of areas, including that in raising finance through public private partnership (PPP), setting up National Rail Transport University, generation of non-fare revenue, and optimizing asset base through analytics-based services.
- **Research unit:** To promote in key policy areas, the railways proposed setting up of SRESTHA (Special Railway Establishment for Strategic Technology & Holistic Advancement), a special unit comprising of scientists and railway experts to accomplish long-term research for improving its overall functioning.

Conclusion and recommendations

The Indian Railways has plans to modernize its infrastructure to be at par with the best transit hubs in the world. The government plans to invest INR 8600 billion (~\$130 billion) for new tracks, faster trains and station redevelopment, of this, INR 1 trillion (\$15 billion) is expected to come from the private sector. It is also moving away its focus from fares and new trains to improving customer experience, for which it intends to modernize identified corridors, revamp stations, make disabled-friendly stations, and double the average speed of freight trains, among others. It is correspondingly looking at non-fare revenue streams, including advertising and land leasing. This ensures ample opportunities for the private players, particularly as it has allowed up to 100% FDI in a number of areas, including, operation and maintenance services, manufacturing services, and signaling and infrastructure projects.

17. Professional Services

Industry profile

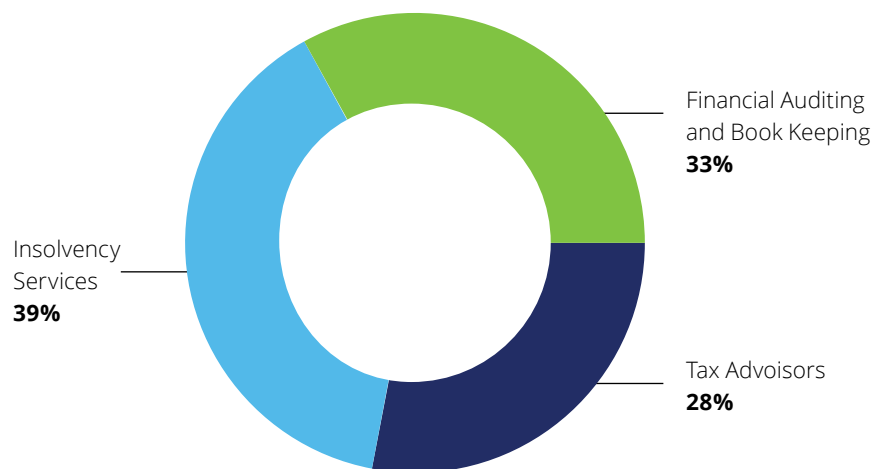


Professional services include a range of different occupations like Audit and Accounting, Management consulting, Architectural and Engineering and Legal services which provide support to different businesses across the world. Professional service providers add value through their advisory services to their clients to improve productivity, growth by ensuring required compliance. This includes services like but not limited to taxation advisory, non-attest assurance/accounting services, associated compliance services, management consulting in the areas of bringing productivity efficiencies, structural consulting in terms of engineering and architecture. Professional services support businesses of all sizes and in a wide range of industries. The professional services market size is \$14.43 billion and there is a high growth in the export market with 9.4% growth recorded in the first half of 2015-16²⁷⁴.

Audit and Accounting Services

The Accounting and Auditing services constitute the core activities of accountancy firms', i.e., evaluation of the reliability and credibility of financial information as well as a wide range of additional services like assurance services, merger audits, insolvency services, tax advice, investment services, and management consulting. The internal

Figure 55 : Accounting and Auditing production turnover (% Share)



Source: Industry Capsule: Euromonitor, Deloitte Analysis

expertise developed by the profession in regard to information technology has resulted in accountancy firms becoming among the world's largest suppliers of such consultancy services.

The accounting and auditing industry in India is driven by double-digit growth in the FDI inflows and the rising activity in the manufacturing sector due to the 'Make in India' initiative. The FDI inflow in India grew by 30% making India the fourth largest receiver of FDI after Hong Kong, China and Singapore. The sector recorded a 10%

revenue growth in 2015.²⁷⁵ The slowed down M&A activities in 2015 and 2016 has restricted the financial advisory services revenue in India. However the anticipated rise of M&A activities in 2017 is expected to restore the revenue directions. In 2015, Tax advisor services managed to earn the highest share of revenue with approximately INR 49 billion while financial auditing and book keeping services and Insolvency services revenue was approximately INR 43 million and INR 35 million respectively. The major accounting firms generated \$128 billion revenue globally in 2015²⁷⁶.

Domestic and global demand: The economy is changing rapidly due to globalization and industrialization. Rising tension due to increasing financial crisis around the world and rising international trade activities implies to the importance of accounting and auditing services across the world. As a natural outcome, regulatory policies, laws and accounting and audit standards are getting updated to respond to economic fallout and public outcry. Overall there is an increased awareness and stakeholders' expectations in the area of public accounting. The geographical expansion and diverse business portfolios across the world has also created a

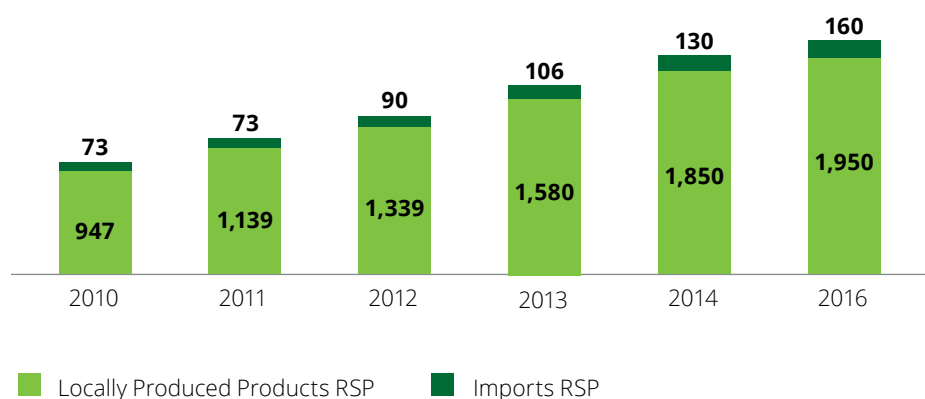
global demand of audit and accounting services. The large availability of talent pool, low-cost structure and technology driven outsourcing services in India makes it the perfect destination for accounting and auditing services. Similarly, from a domestic perspective, rising growth of this market, investments from global players, new business models in the technology space and ease of doing business are the growth drivers. The new Indian accounting standards (Ind AS), converged with International Financial Reporting Standard (IFRS) has been a catalyst of growing demand in the audit service space in India. While The American Institute of CPAs

(AICPA) has highest accounting professions with 664,532²⁷⁷ professionals, India also has a demographic advantage with The Institute of Chartered Accountants of India (ICAI) having 253,369²⁷⁸ members in comparison to Institute of Chartered Accountants in England and Wales (ICAEW) which has 147,000 members.²⁷⁹

Competitive profile: India has a plethora of accounting firms which are still new in the market in comparison to large audit firms in the US, UK, and some other European countries with wide global presence. Global companies in India leverage experience, reputation, network and expertise to gain more clients and revenue than smaller firms. However smaller firms find it difficult to develop industry-specific knowledge, technical expertise due to poor financial health and fall behind the bigger firms.

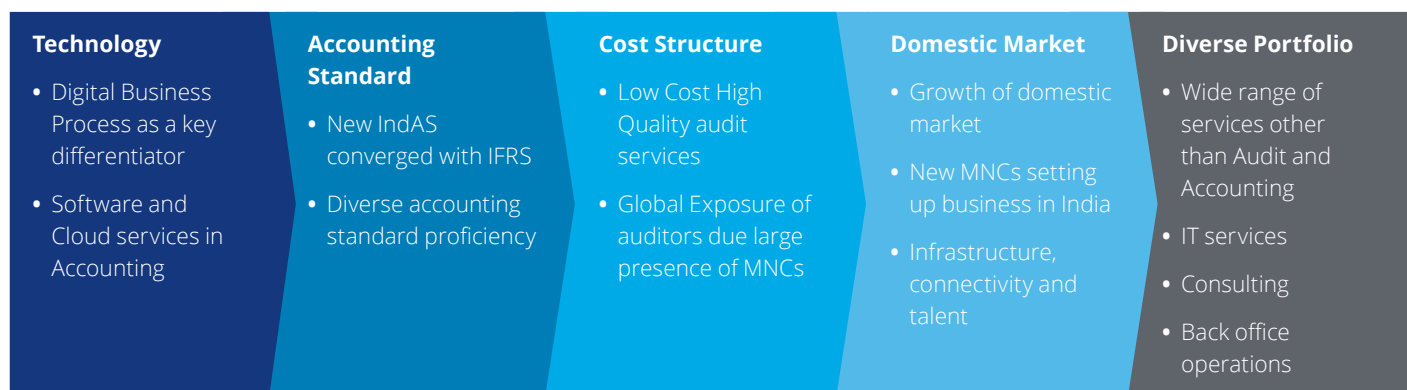
There is a constant threat from South Korean as well as Chinese markets which is a challenge to India's niche expertise of low cost operation. The performance of the market is forecast to decelerate, with an anticipated CAGR of 7.8% for the five-year period 2015-2020, which is expected to drive the market to a value of \$14.8 billion by the end of 2020. Comparatively, the South Korean and Chinese markets is expected to grow with CAGRs of 2.7% and 9.7% respectively, over the same period, to reach respective values of \$8.7 billion and \$16.2 billion in 2020.

Figure 56: Accounting and Auditing Market Demand 2010-2015 (~\$ million)



Source: Industry Capsule: Euromonitor, Accessed via EMIS

Growth Drivers:



Source: Deloitte Analysis

Potential for global expansion: The rising adoption of technology based audit process, talent pool, niche expertise on cost, diverse portfolio offering and accounting standard makes India a hot destination for countries where Audit and Accounting is less developed. Under developed countries in Africa and least developed countries like Afghanistan, Myanmar provides opportunity for global expansion to the Indian firms. Institute of Chartered accountants of India (ICAI) has signed MoUs with international bodies which will help in CAs practicing in different countries and will help in increasing international trade. It has signed

a Memorandum of Understanding (MoU) with Chartered Institute of Australia, Canada, New Zealand, Ireland and Oman. Presently, around 200000 members and 1 million students are pursuing the course from ICAI in India.

Future prospects: India's demographic advantage is well known. The syllabus of the Chartered Accountancy, Cost Accountancy and Company Secretary courses are aligned/being aligned to the global standards. Both these factors create a tremendous opportunities for Indian accounting and auditing professionals to cater to the global markets. Also there is

exponential demand to take care of the potential of supply of services getting generated in the country. For example, renowned global companies setting up there financial and accounting shared services centers in India is a big and non-linear shift in the business model opening up many new accounting and auditing profiles for the talent pool in India. The growth in the global market is reflected in the operations of these shared service centers, thereby creating the growth prospects for Indian accounting/auditing services.

Recommendations:

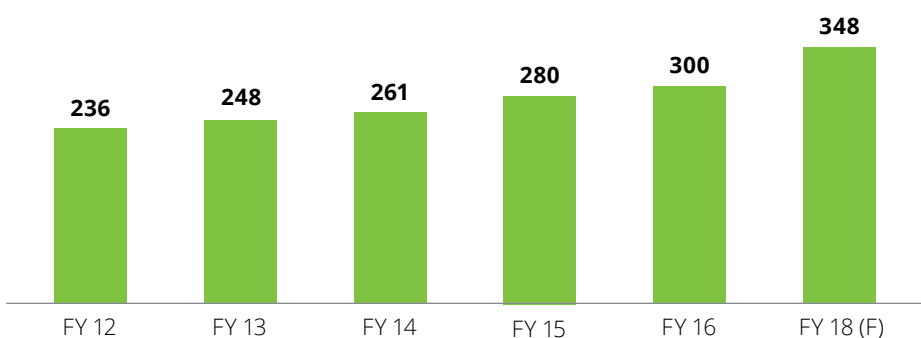
Subject	Present Status	Recommendations
FDI in the sector	46% in services	<ul style="list-style-type: none"> Relaxation on FDI will attract more foreign funds and help in better exposure of the Indian firms in global market and vice versa
Limitation related to Licensing and accreditation	High	<ul style="list-style-type: none"> Developing talent pool in India which is accredited for the global accounting and auditing standards which will enable working with entities from different geographies

Management Consulting

Management consulting sector provides specialized advisory services to help in management decision making in a company. These services helps the organizations in various ways like Business Optimization and restructuring, expanding new business, product

line and exploring new markets. The management consultancy market size is expected to be around INR 300 billion in India and is expected to touch INR 348 billion by 2018²⁸¹. The market is extremely fragmented and competitive with and is a combination of selected global and no. of small players.

Figure 57: Sector Contribution to GVA (INR million)



■ Contribution to GVA (INR million)

Source: Dun & Bradstreet Research

Market segments:

Management Consulting <ul style="list-style-type: none">• Corporate Strategy• Regulatory strategy• M&A and JV• Restructuring & Cost Optimization	Engineering Consulting <ul style="list-style-type: none">• Feasibility Study• Cost Estimation• Project Management• Project Lifecycle• Engineering design Support	Socio-economic Consulting <ul style="list-style-type: none">• Urban planning• Rural Development• Environment Impact Assessment• Renewable Energy	IT Consulting <ul style="list-style-type: none">• IT Strategy• Performance Improvement• IT M&A• IT Project Effectiveness	HR Consulting <ul style="list-style-type: none">• Workforce Management• Training & Development• Leadership Development
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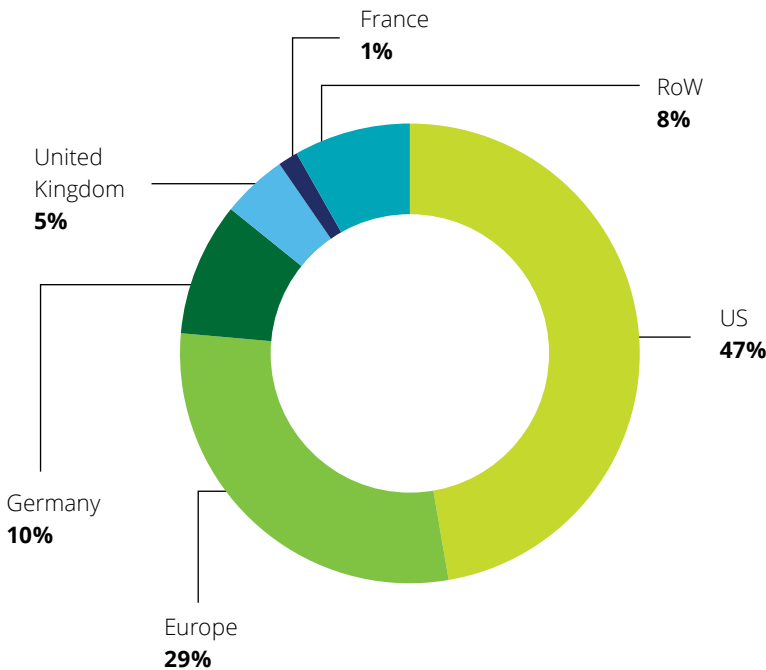
Global and domestic demand:

The global management and marketing consultancy market had total revenues of \$321 billion in 2015, representing a CAGR of 4.5% between 2011 and 2015. There has been a constant rise in demand for management and consulting services across the world due to Globalization,

economic reform measures and rising trade activities. The US and Europe who represent 47% and 29% of the global market share are the major players for Indian consulting services sector while other countries like Germany, UK, and France are also popular in the consulting arena.

The recent reforms in Indian economy and government initiative to boost manufacturing sector in India has also playing a significant role to generate demand in the domestic market. The Indian education sector has 10,330 management institutes with almost 700,000 faculties. The total enrolment in management colleges in 2015-16 is around 2 million.²⁸² Some of the management institutes are known globally for the quality of education and talent they produce. Talent pool in the management sector has been a strong point in India's arsenal.

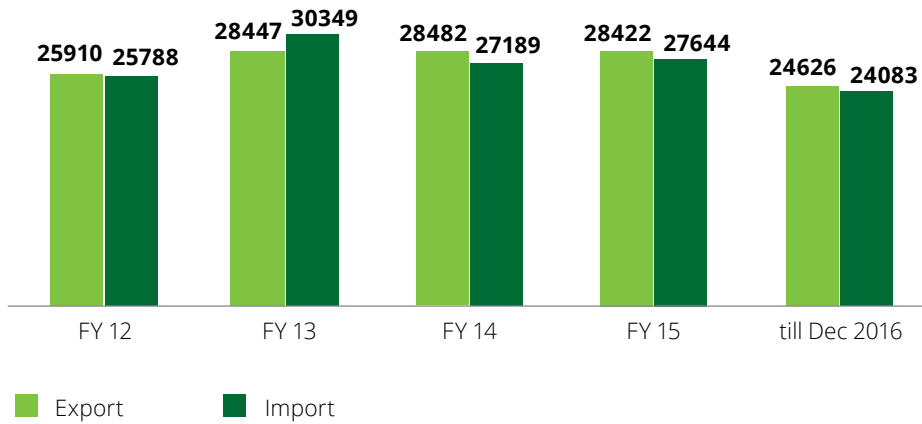
Figure 58: Consulting market share



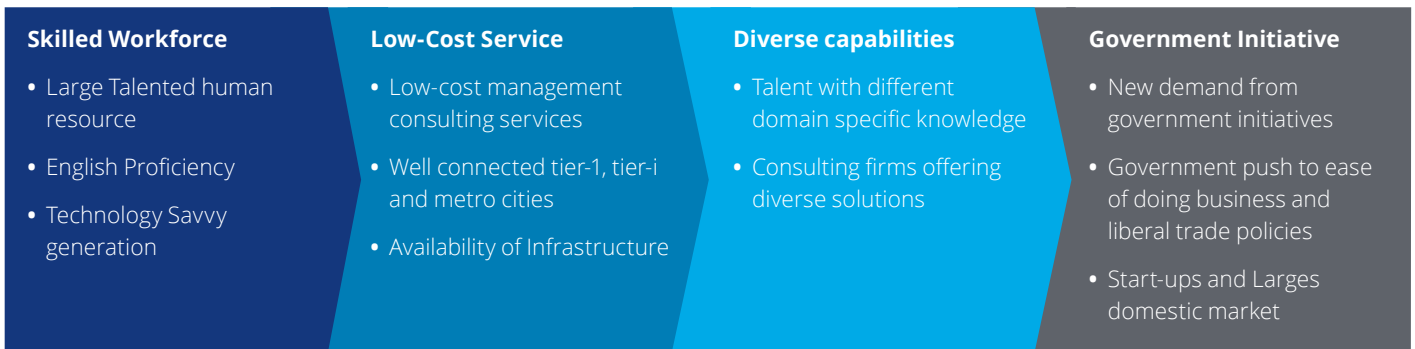
Source: Global Management & Marketing Consultancy Report, MarketLine

Export market:

The Management consulting service sector in India has changed its stance, from being an import market to becoming a major exporter in the last few years due to rise of management consultant firms both in domestic as well as international market. The US and Europe are the major export destinations.

Figure 59: Export/Import market in \$million

Source: RBI

Growth Drivers

Source: Deloitte Analysis

Future prospects for the industry

The Indian economy has witnessed strong growth in the last few years amidst global economy crisis, political instability and changing regulatory environment. The government has introduced numerous

initiatives to make India an attractive market for manufacturing, service outsourcing, research and development, etc. Initiatives like make in India, liberalization of FDI policy, etc. has opened the market to the global investors.

- Make in India initiative and liberal FDI policy has attracted many foreign investors to start business in India which will create a huge demand for consulting services.

Recommendations:

Subject	Present Status	Recommendations
Promotion and Branding	Low	<ul style="list-style-type: none"> A promotional branding strategy is required to promote Indian firms in the international arena
Funding	Need Based	<ul style="list-style-type: none"> Homegrown small Indian firms need high financial support
Make in India	Manufacturing	<ul style="list-style-type: none"> Expansion of make in India activities to support export market
Export promotion council	Not present in India	<ul style="list-style-type: none"> Export promotion councils can help in export growth
Understanding Global Market	Low access to global market data	<ul style="list-style-type: none"> Research on global market to gain market knowledge Bilateral trade agreement to promote export growth Information through affiliates and subsidiaries to understand the market

- India is the fastest growing startup ecosystem in the world and government initiative “startup India” along with technology savvy young population with entrepreneurial mindset are bringing new ideas into business. These fast growing startups are creating a demand for professional services in the country.
- Liberal trade agreements are also helping more and more trade export to the US and European countries.

Architecture and Engineering Services

For a developing country like India, infrastructure development is a key driver of growth. And that signifies the importance of architecture and engineering services in the country. Architecture and engineering services are the backbone of the construction services and covers several related activities, such as advisory and pre-design architectural services, architectural design, contract administration services, urban planning, etc. Architectural and Engineering services are often combined into projects offered by one company.

The government initiative in India to promote infrastructure development services are creating a large demand for architectural and engineering services in India. There are several policy changes like allowing 100% FDI in the real-estate sector has made the market attractive for foreign investors. India’s architectural and engineering sector is mostly fragmented with more than 50,000 players in the market. The top players represent only 5% of the total market. The Architectural and Engineering services in India is expected to reach around \$1.5 billion by 2018 growing at a CAGR of 14.2%²⁸³. The sector mostly consists of B2B segment which represents around 99% of the total size. Public administrator, defense and social security are the major areas of investment. With rising demand there is a need for more man power as well as skilled labors in the sector.

Global and domestic potential:

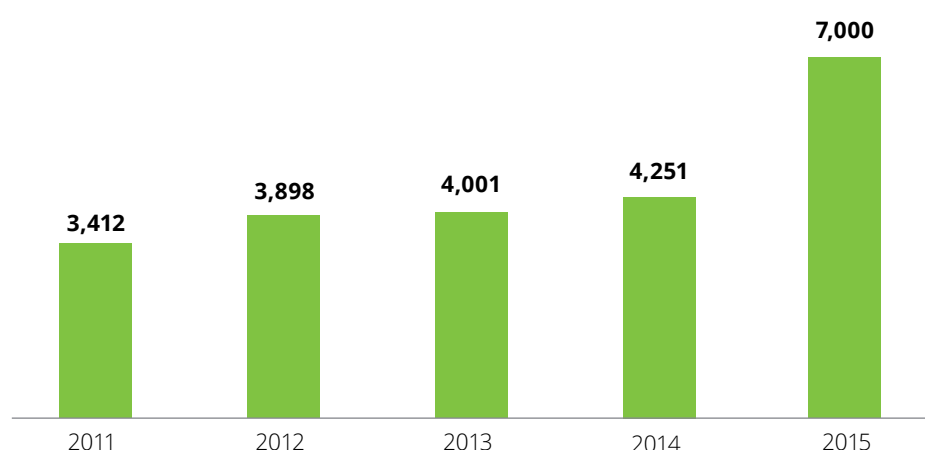
Rapid urbanization and industrialization of the Indian economy has generated huge demand for business and residential premises, especially in urban India, with rising investment in the real estate. Public and private spending on different infrastructure and real estate projects such as housing projects, railway projects, roads, ports and airport, etc. has given significant opportunity to the sector. Government spending on smart city projects are also providing a platform for innovative architecture and engineering services. India’s exports in architectural and engineering services were approximately \$6.9 million in 2014. In a global scenario

high spending in architectural and engineering services in European countries like the UK, France, Germany, Spain and Italy as well as APAC countries like South Korea, Japan and Australia are the leading export market. Engineering products exports from India was \$62 billion in FY 2013-14²⁸⁴. South America, Caribbean, Kenya, Iran and developing nations like Cambodia, Peru, and Sri Lanka are the leading export market for engineering services²⁸⁵.

Talent/Skill requirement

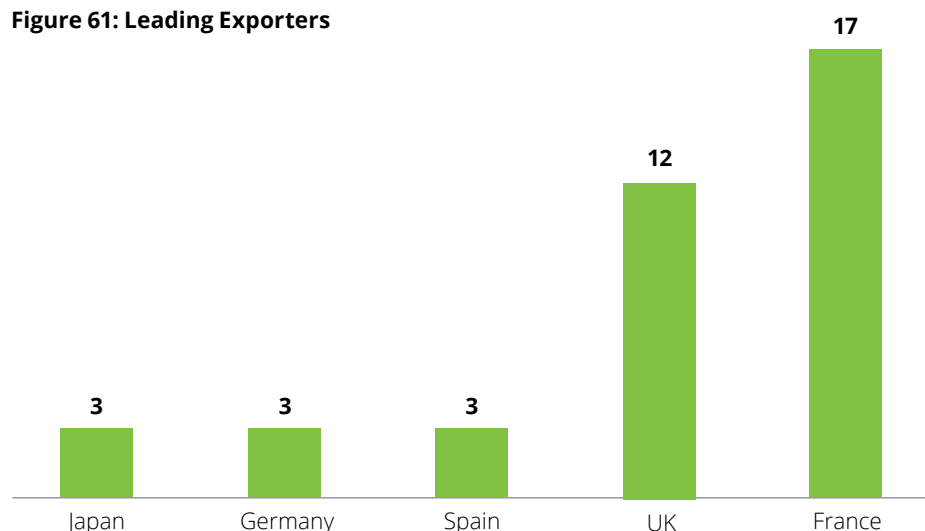
The country has total 6431 approved Engineering and technology institutes while 171 architecture and 8 town

Figure 60: Architecture Enrolment



Source: AICTE

Figure 61: Leading Exporters



Source: Euromonitor via ISI Emerging Markets

planning institutes. The Engineering and technology institutes constitute of 3,364 undergraduate colleges, and 2,305 post graduate colleges while 3,851 diploma colleges.²⁸⁶ More investment in the architecture skill development is the need of the hour. According to India Council of Architecture, there are 40,000 registered architectural professionals in India²⁸⁷ and the demand is too high with 1.25 billion population in the country and high demand for urbanization. The gap in demand means finding international talent. Though there are an ample amount of engineering institutes, the quality of education is still a worry as only few top level institutes manage to provide high quality education and employment opportunity.

Competitive profile: The US, Western Europe, and China are the major exporters of architectural and engineering services and are challenges to Indian architectural and engineering firms. Japan, Germany, Spain, and France are other leading competitors in terms of architectural and engineering services market.

Growth drivers: India has transforming from a restrictive market to a platform for huge global investment. Though architecture and engineering services are in its nascent stage of development there is ample opportunity of growth in the sector due to liberal government policies, growing domestic market, government initiatives like make in India, smart city projects etc. In a global environment low cost structure, high availability of skilled workforce and language proficiency are the drivers of growth. Large presence of knowledge process outsourcing for both architectural and engineering services make India a potential hub for R&D activities.

Future prospects:

- **Talent:** There is a need to spend more on skilling and talent building. Number of professionals in the service sector specifically in the architectural services are not enough to cater to the future demand from urbanization and industrialization.

- **Outsourcing spends:** As per some global analysts the spending in engineering outsourcing services market is set to increase as the demand for such services keep growing due to huge development initiatives across the world and rising outsourcing competition from other countries.

- **Expectation of shorter project lifecycle:** Consumers today are well-informed and knowledgeable when it comes to the new technologies being used in engineering domain. Clients expect to have very short project lifecycles and service providers are pressurized to meet these demands and stay ahead of the competition in the market and grab the market share.

- **Start-up ecosystem:** The emerging startup ecosystem in India will be helpful to generate domestic demand as well as to create innovative architectural and engineering service solutions to cater to the rising domestic and global demand. Start-ups with innovative architectural idea can provide new solution to the lack of infrastructure issue in India.

Recommendations:

Subject	Present Status	Recommendations
Trade Agreement	Low activity	<ul style="list-style-type: none"> • Promote trade agreements for easier promotion of Architectural and Engineering Services
Export Body	Not Present	<ul style="list-style-type: none"> • Agencies in different countries to promote architectural and Engineering services by connecting Indian companies to new clients
Promoting India's Expertise	Low	<ul style="list-style-type: none"> • Participate and promote in global events
Mutual Recognition Agreements	Unknown	<ul style="list-style-type: none"> • Mutual Agreement with statutory bodies of other countries with potential demand for services
LLPs with private companies	Not Allowed	<ul style="list-style-type: none"> • Allowing will help in the growth of the sector with higher compensation and investments

Legal

Proper implementation of laws and regulations requires a well-functioning legal service sector. With increasing globalization and constant policy reforms in India, more and more companies are willing to setup their business in India which creates a demand for domestic legal services. Increased level of globalization and international trade has helped the Indian legal services sector to expand as there is more requirement of documentation, legal advice on setting up and structuring the business. The sector is one of the most restricted sectors both in India as well as globally. The market grew by 6% in 2015 in comparison to 17% CAGR growth over 2010-2015.²⁸⁸ While the revenue growth is fueled by government initiatives to ease regulations on foreign investments and rising demand of domestic market, the decline in the mergers and acquisitions deal value is a barrier to the revenue growth. Also Indian companies enhancing their footprints globally (subsidiaries, associates, etc.), there is an increased level of compliance requirements. This opens up opportunity for Indian law firms to increase their sphere of operations.

Domestic and global demand:

Under current regulations, foreign law firms are not allowed to practice in India. But there is an increasing number of foreign multinational companies are looking to enter India for other business opportunities in the legal sector. Some of the Indian companies are also eager to

Growth Drivers

Large Talent Pool

- Large talented human resource
- Skilled workforce with English proficiency
- 1200 Law colleges
- 70-80 thousand enrolments in law colleges every year

Versatile Skills

- Expertise in legal activities like Merger and Acquisition
- Infrastructure financing
- Public Private Partnership

enter the international market (including tie-ups with global players) which is putting pressure on Indian government for liberalization of the sector. The US and UK are the largest legal markets and provides export potential for India.

Talent pool:

India's legal profession is the world's second-largest, with more than 600,000 lawyers in more than 500 legal practices nationwide.²⁸⁹ There are around 1200 law schools in India with around 70,000-80,000 enrolments every year.²⁹⁰

Competitive profile: Countries like the US and UK has the advantage of organized law firms and are home to most of the big players in the sector. The sector's trade surplus has nearly doubled over the past decade to £3.4 billion in 2015, while the sector's contribution to the UK economy increased to a record £25.7 billion in 2015 (1.6% of GDP). According to TheCityUK

estimates, the UK accounts for around 10% of the global market for legal services, second only to the US. It is also the largest market in Europe, accounting for around a fifth of its legal services fee revenue.²⁹¹ The UK is the world's most international market for legal services and it offers unrestricted access to foreign firms with over 200 foreign law firms from around 40 jurisdictions present in the UK. The US is another major market in the Legal Service exports. China has started legal exports with major law firms setting up offices in China.

Recommendations:

Subject	Present Status	Recommendations
Liberalization	Restricted	• Requires FDI allowance for better growth, allowing foreign firms to enter Indian marketServices
Increasing Entry threshold	Low entry threshold	• All India Bar Exam need to increase the entry threshold to create raise the quality of legal professionals in India like ICAI
Legal Infrastructure	Poor	• Requires more courtrooms and infrastructure
Right to Advertise	Unknown	• Advocates and Legal firms can create greater brands when allowed to advertise. This will help in better quality of service

18. Tourism & Hospitality

Industry profile



The value of the restaurant and hotel industry is expected to continue to grow at a rate (averaging 8.1% annually throughout the forecast period), as India seeks to develop and diversify the types of tourists served. Its value will increase from \$28.1 billion in 2016 to \$39.8 billion by 2020.²⁹² While the hotel and restaurant industry contributes less than 1.5% of GDP—a share that will be maintained in the next five years—this merely attests to the diversity and strength of other industries, such as IT, mining and infrastructure, which remain

very important to the economy. There are around 2,333 number of hotels spread across various categories; 1/2/3/4/5 star, heritage hotels, apartment hotels, etc. in India, which serves around 79,000 rooms, in the Country, as on 31 December, 2014.

India ranks third among 184 countries in terms of total contribution of tourism to GDP of 7.5% in 2016.

Direct contribution of the sector is in India's GDP estimated to be \$47 billion in 2016. The sector's total contribution to GDP is expected to increase to \$136.2 billion by the end of 2016. The total contribution of travel & tourism to Indian GDP is forecasted to increase by 4.97% per annum to \$280.5 billion by 2026.

In 2015, the total contribution of Travel and Tourism to employment was 8.7% of the total employment. It is expected to rise by 3.0% in 2016 and by 1.9% pa to 9% in 2026.²⁹³

Figure 62: Total contribution to GDP (in \$ billion)

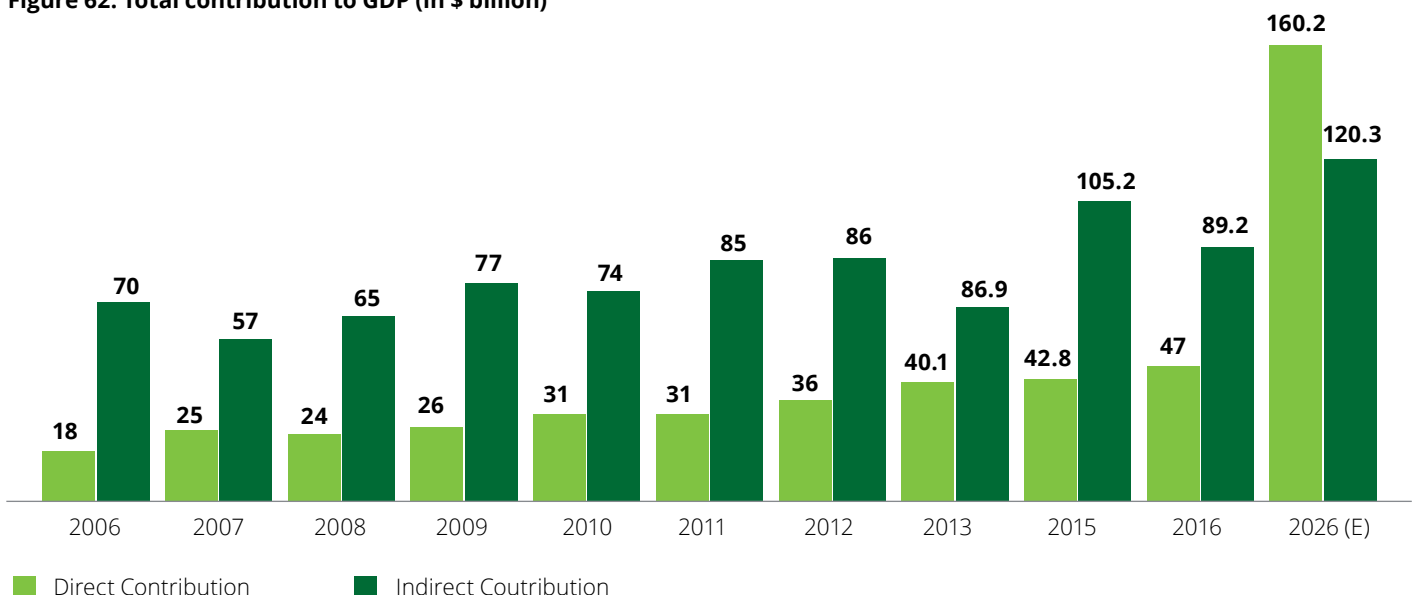
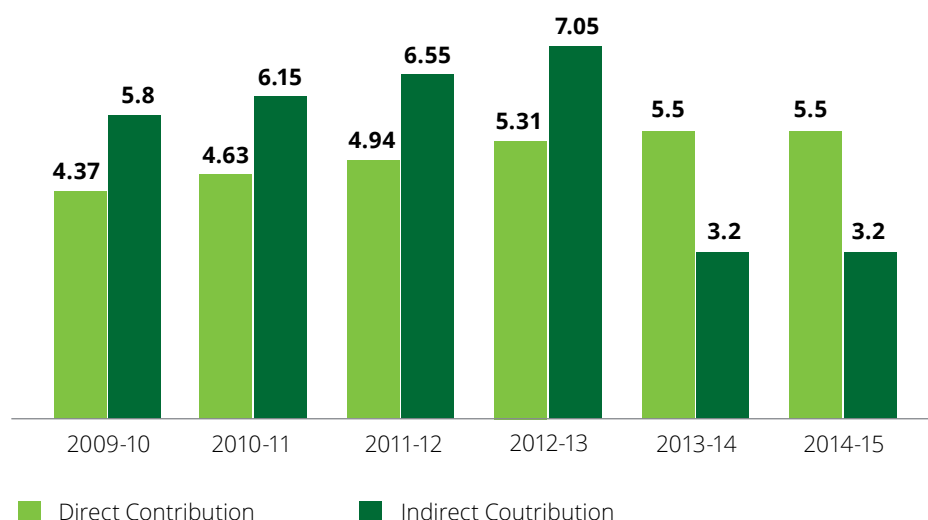


Figure 63: Total contribution to Employment (in %)



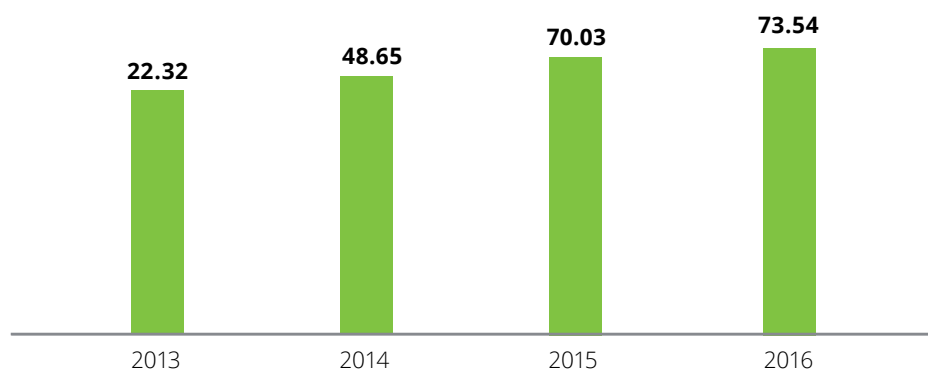
In 2016, Foreign Tourist Arrivals (FTAs) in India was 8.9 million as compared to 8.3 million in 2015²⁹⁴. This is forecasted to increase at a CAGR of 7.1% during 2005–2025. According to the World Tourism Organisation, foreign tourist arrivals in India is expected to reach 15.3 million by 2025.

The share of FTAs in India during December 2016 among the top 15 source countries was highest from US (18.33%) followed by, Bangladesh (13.02%), UK (11.71%), Australia (5.43%), Russian Fed (4.18%), Canada (4.13%), Malaysia (3.38%), Germany (2.80%), China (2.53%), Sri Lanka (2.25%), Singapore (2.12%), France (2.01%), Japan (1.79%), Afghanistan (1.38%), and Nepal (1.34%).²⁹⁵

During January–December 2016, a total of 1.07 million tourists arrived on e-Tourist Visa as compared to 0.44 during January–December 2015, registering a growth of 142.5%. The growth was mainly attributed to introduction of e-Tourist Visa for 161 countries as against the earlier coverage of 113 countries.²⁹⁶

Foreign exchange Earnings (FEEs) from tourism was INR 1,556.50 billion in 2016, witnessing growth of 15.1% from 2015.

Figure 64: FDI in Tourism (in INR billion)



FDI in tourism and hospitality sector

The tourism and hospitality sector generated FDI inflows of INR 73.5 billion in 2016, and a cumulative inflow of INR 544.48 billion during Jan 2000 to Dec 2016.²⁹⁷

Currently, 100% FDI is allowed under the automatic route in the tourism & hospitality sector. 100% FDI is also allowed in tourism construction projects, which include development of hotels, resorts & recreational facilities.²⁹⁸

• Domestic expenditure on tourism:

Domestic expenditure on tourism has grown significantly; by the end of 2016, the market is projected to reach \$96 billion, representing growth at a CAGR of 5.4% during 2008–16, which is further anticipated to increase to \$332.4 billion by 2025.²⁹⁹

• Capital investment in the tourism sector:

Capital investment in the tourism and hospitality sector is expected to increase at a CAGR of 6.2% during 2009–16. By 2025, investments are expected to increase to \$125.9 billion.³⁰⁰ International hotel chains are increasing their presence in the country, as it will account for around 47% share in the Tourism and Hospitality sector of India by 2020 and 50% by 2022, increasing from 44% in 2016.

• Collective government spending on tourism:

Government's collective spending on tourism and hospitality sector, in 2016, stood at around \$2.2 billion.³⁰¹ During 2008–2016 (till March 2016), collective government spending on tourism sector is expected to grow at a CAGR of 6.8%. By 2025, the government's collective spending is expected to increase to \$7.0 billion.

• **Online travel (OTA):** OTAs offer single marketplace for all travel related needs. Online Accommodation Reservation Services specialize in accommodation look-up and bookings. Rate parity is the offering of same price for the same room night regardless of the distribution channel. Indian online hotel industry to be \$1.8 billion by 2016 from the current

\$0.8 billion. Hotel bookings is one of the least penetrated segment within the travel categories in India; online bookings account for 16% of the hotel booking currently. In Europe, 70% of hotel rooms are booked via online booking portals while it stands at 35%-50% in the US.

• Destination Management

Organization (DMO): These are marketing organisations which initiate a standardized procedure to market a destination. They are designed to bring visitors in touch with marketers (providers of tourism products and services). They are perceived to manage a destination evolving into a "total destination management system". Some of the international DMOs are present in India.

Growth drivers for the industry

- **Robust demand:** Foreign tourist arrivals expected to increase at CAGR of 7.1% over 2005–25. India recorded 8.9 million foreign tourist arrivals in 2016, listing an annual growth of 4.5% over the previous year. By 2020, medical tourism industry of India is expected to touch \$8 billion.³⁰² A separate board has been formed by the Ministry of Tourism for this purpose which is expected to drive the growth in coming years.
- **Growing demand:** Domestic expenditure on tourism is expected to rise due to the growing income of households. A number of niche offerings such as medical tourism & eco-tourism are expected to create more demand.
- **Attractive opportunities:** India has a diverse portfolio of niche tourism products—cruises, adventure, medical, wellness, sports, MICE, ecotourism, film, rural, and religious tourism.
- **Diverse attractions:** India offers geographical diversity, attractive beaches, 30 World Heritage Sites and 25 biogeographic zone.
- **Policy support:** The Visa on Arrival scheme was extended to 180 countries in 2016. A five-year tax holiday has been offered for 2-, 3-, and 4- star category

hotels located around UNESCO World Heritage sites (except Delhi and Mumbai). 100% FDI is allowed under the automatic route in tourism & hospitality, subject to applicable regulations and laws. 100% FDI allowed in tourism construction projects, including the development of hotels, resorts & recreational facilities

- **State incentives:** Incentives offered by state governments include subsidised land cost, relaxation in stamp duty, and exemption on sale/lease of land, power tariff incentives, concessional rate of interest on loans, investment subsidies/ tax incentives, backward areas subsidies and special incentive packages for mega projects. Incentives are provided for setting up projects in special areas – the North-east, Jammu & Kashmir, Himachal Pradesh and Uttarakhand.
- **Incentives from the Ministry Of Tourism:** These include assistance in large revenue-generating projects, Support to PPPs in infrastructure development such as viability gap funding, Schemes for capacity-building of service providers.
- **Infrastructure:** More than half of the Ministry of Tourism's Plan budget is channelized for funding the development of destinations, circuits, mega projects as well as rural tourism infrastructure projects.

Government Initiatives

- **Swadesh Darshan:** 13 thematic circuits have been identified for development: North-East India Circuit, Buddhist Circuit, Himalayan Circuit, Coastal Circuit, Krishna Circuit, Desert Circuit, Tribal Circuit, Eco Circuit, Wildlife Circuit, Rural Circuit, Spiritual Circuit, Ramayana Circuit & Heritage Circuit. During FY2016-17, the ministry has sanctioned 31 projects under this scheme, with Central Financial Assistance of INR 26 billion and INR 5 billion.
- **Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASAD):** 25 sites of religious significance have been identified for development under the PRASAD Scheme. The

projects sanctioned during FY2016-17 include Belur (West Bengal), Dwarka (Gujarat), Hazratbal (Jammu & Kashmir), Kanchipuram and Vellankani (Tamil Nadu).

- **Visa approvals:** As on 31 December, 2016 the 'e-visa' facility is available under 3 sub-categories i.e. 'e- Tourist Visa', e – Business Visa' and 'e – Medical Visa'. E –Visa facility has been extended to the nationals of 161 countries.³⁰³ E-medical Visa provides visa for foreign travellers visiting India for medical treatment under Indian systems of medicine.
- **Pre-loaded sim cards to foreign tourists:** In February 2017, the Ministry of Tourism announced to provide pre-loaded sim cards to foreign tourists arriving India on e-Visa. Bharat Sanchar Nigam Ltd. (BSNL) will distribute pre-loaded SIM cards to foreign tourists on e-Visa, initially at New Delhi airport and later in the remaining 15 international airports.³⁰⁴
- **Multi-Lingual Tourist Info Line:** The ministry operates a 24x7 Toll Free Multi-Lingual Tourist Info Line in 10 International Languages to provide information and assistance to domestic and international tourists while travelling in India.
- **Set up of National Medical and Wellness Tourism Board:** The ministry has constituted a National Medical & Wellness and Tourism Board to provide institutional framework and promote medical tourism, wellness tourism and Yoga, Ayurveda Tourism and any other format of Indian medicine covered by Ayurveda, Yoga, Unani, Siddha and Homeopathy (AYUSH).
- **Adventure Tourism:** The Ministry has issued guidelines for the approval of Adventure Tour Operators. It has also formulated a set of guidelines on Safety and Quality Norms on Adventure Tourism as basic minimum standards for adventure tourism activities.
- **Trained manpower:** As part of the Ministry's initiative to generate professionally trained manpower to meet the needs of the tourism &

hospitality industry, 42 Institutes of Hotel Management (IHMs) (21 Central IHMs and 21 State IHMs), and 10 Food Craft Institutes (FCIs), have been set up with financial assistance from the Ministry of Tourism.

• International Advertisement

Campaign: The ministry has launched an International Advertisement Campaign in electronic and digital media for FY 2016-17 on leading Television Channels including CNN, BBC, Discovery & TLC, Euro News, History, CNBC, Travel Channel, CBS (USA), Tabi (Japan) and RMC (France) and Google.

• MoUs for developing tourist places in states:

As on February 2017, the State Governments of Chhattisgarh, Gujarat, Karnataka, Rajasthan and Uttarakhand have signed 86 MoUs for developing tourist places in their respective states.

• Allocation for North- Eastern regions:

The Ministry provides complimentary space to the North Eastern States, in the India Pavilions set up at major international travel fairs and exhibitions. It also provides Marketing Development Assistance (MDA) to tourism service providers to undertake promotional activities overseas and also in India.

• **Special boards:** The Ministry has set up a Hospitality Development and Promotion Board (HDPB), which will monitor and facilitate hotel project clearances/ approvals.

• **Project Mausam:** Under 'Project Mausam' the government has proposed to establish cross cultural linkages and to revive historic maritime cultural and economic ties with 39 Indian Ocean countries. In 2015, Government of India linked China Silk Road project with Project Mausam.

Future prospects of the industry

• **Medical tourism:** The presence of world-class hospitals and skilled medical professionals makes India a preferred destination for medical tourism. India's earnings from medical tourism could exceed \$8 billion by 2020.³⁰⁵ Tour operators are teaming up with hospitals to tap this market.

• **Cruise tourism:** Cruise shipping is one of the most dynamic and fastest growing segments of the global leisure industry. Government of India has estimated that India would emerge with a market size of 1.2 million cruise visitors by 2030 – 31. Moreover, India is looking to take

advantage of its 7,500 km coastline to tap growth potential of the cruise tourism segment through its Sagarmala Project which was established in July 2015.

• **Rural tourism:** The potential for the development of rural tourism in India is high as most of its population resides in rural areas. This can benefit the local community economically and socially, and facilitate interaction between tourists and locals for a mutually enriching experience.

• **Eco-tourism:** India is often termed as a hotspot of biodiversity and this rich natural heritage is unparalleled in many ways. Such a valuable resource base gives impetus for the practice of variety of alternate tourism forms, many of which are already in existence.

Potential for global expansion

The rising number of foreign tourist arrivals from different parts of the world suggests that there is huge scope for India to attract the foreign tourists. Below is the comparison of number of arrivals in India during 2014 and 2015 with some of the countries/geographies experiencing high number of arrivals.³⁰⁶

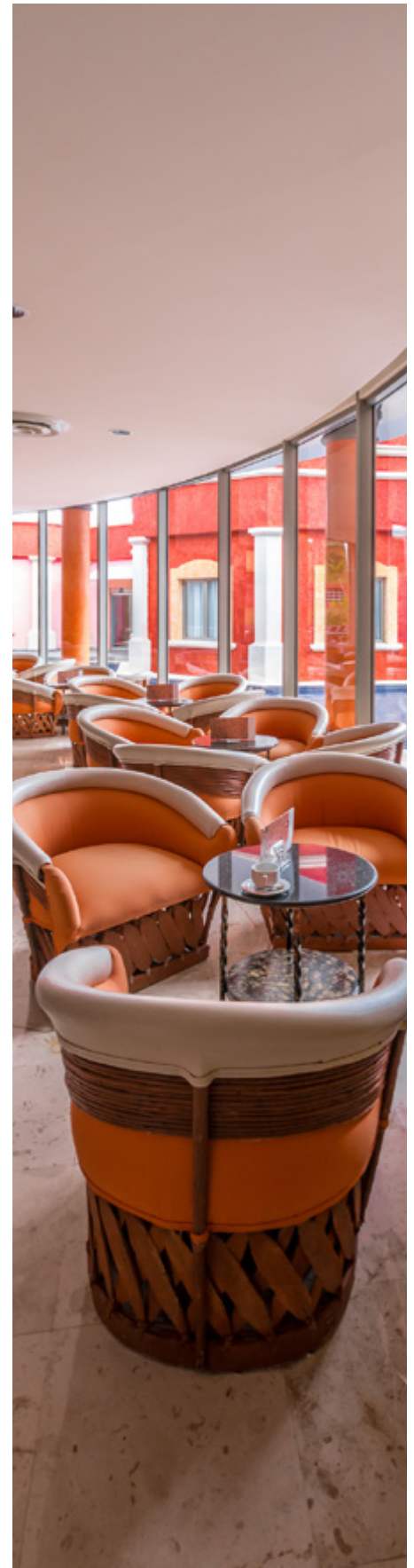
Country/Geography	2014	2015	Percentage change 2015/14
South Asia	1694857	1946207	14.8
Western Europe	1860580	1880203	1.1
North America	1387468	1494930	7.7
South East Asia	685805	700298	2.1
East Asia	546792	555770	1.6
West Asia	413678	417616	1
Eastern Europe	422278	331051	-21.6
Australasia	286294	312101	9
Africa	280754	293569	4.6
Central & South America	69926	70831	1.3
Not Classified	30667	24557	-19.9

Improving inner capabilities such as Quality of People engaged in Tourism & Hospitality – through better program/trainings for deploying quality people across this sector; Infrastructure and Connectivity of the network spread for tourism, Professionalism, Hygiene and Safety to provide world class facilities for tourism.

Conclusion and recommendations

To promote multiple tourism (Rural, Adventure, Medical, Heritage, Luxury, Eco-tourism and Pilgrimage) tourism, the following factors need to be considered:

- **Allow corporate sponsorship for heritage buildings:** An effective solution for this would be to outsource the maintenance and exterior lighting of the heritage monument to corporate giants in return for some branding opportunity at the monument.
- **Create experiences, not sightseeing spots:** The tourism industry which includes the government and private players, needs to manipulate destinations as experiences and not sightseeing point alone. Be it botanical gardens, architectural monuments, backwaters, the Himalayas, the tourism ministry should see the potential of a place to attract tourists rather than merely banking on the natural beauty of a place.
- **Build great roads and access points:** It is critical to build good roads and approach points to a certain tourist destination. Packaged train travel, easy bus connections and safe car hire services with knowledgeable personnel combines with great freeways and highways should be explored.
- **Aggressive tourism marketing strategies:** Tourism ministry should surely pursue aggressive online and other marketing strategies to promote India as a must-visit location. Whether it is broadcasting 'Incredible India' campaigns abroad, holding tourism seminars or offering Indian locations to promote foreign film productions in the country.
- **Sell niche tourism areas separately:** India is currently in a position where it can make a cash cow out of selling customized experiences, luxury spa sessions, rare animal sanctuaries, religious pilgrimage tours and extreme Himalaya tours.



19. Wellness

Industry profile

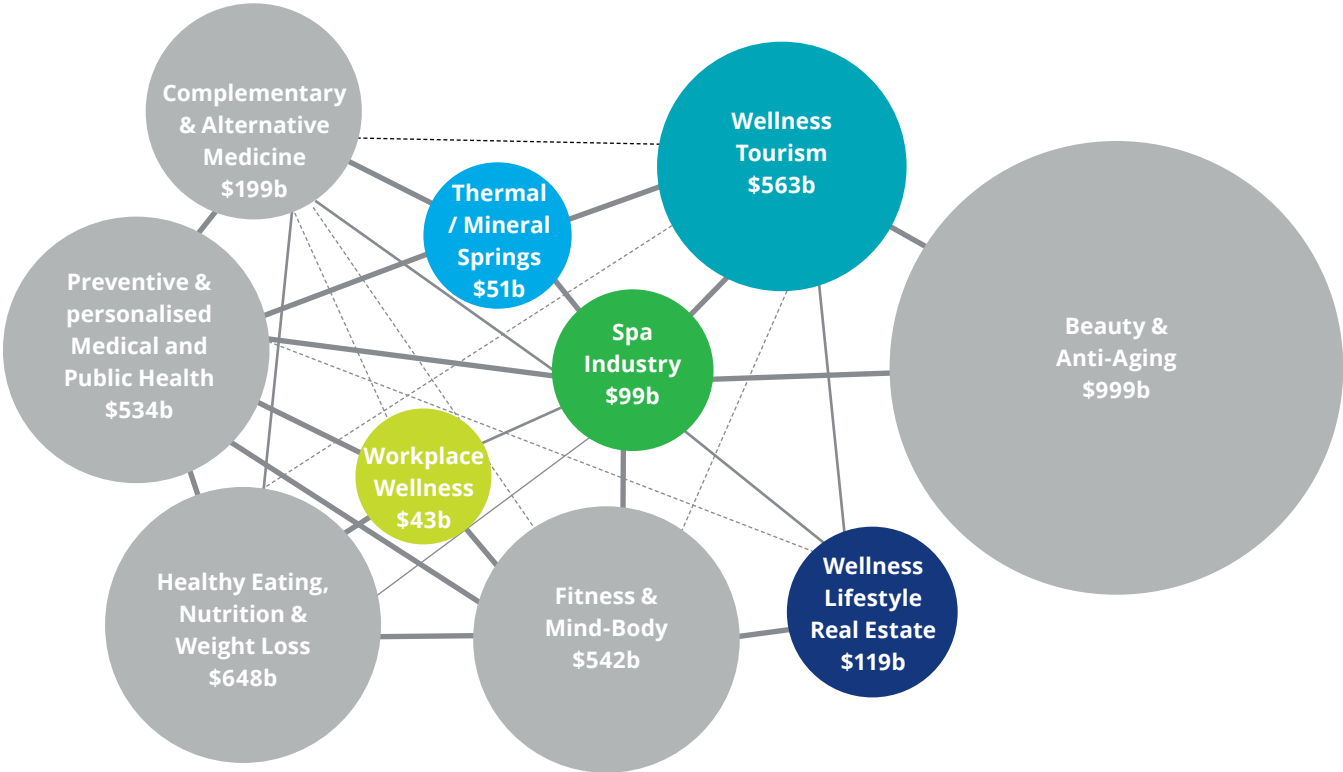


Influenced by modern lifestyles and increased awareness, wellness industry is growing at a tremendous pace with an increasing share of the global economy. Wellness is defined as the active pursuit of activities, choices, and lifestyles that

lead to a state of holistic health, ranging from physical, mental, social to emotional, spiritual wellbeing. The whole idea of wellness is going back to the ancient times—becoming preventive rather than curative.

Globally, wellness industry represents a \$3.7 trillion economy, with a growth of 10.6% from 2013-2015.³⁰⁷ Majorly there are ten sectors which are part of the wellness ecosystem, including beauty, tourism, spa, fitness.

Figure 65: Global wellness economy



Source: Global Wellness Institute

Around two to three decades back, the wellness industry saw its nascent and unstructured, yet promising beginnings. The concept of wellness has since become a globally accepted phenomenon. Indian traditional yoga, interestingly, has become the favorite flavor and an integral part of all wellness spas, centers and festivals worldwide. There has been an unprecedented and steady growth in this sector, marked with sectors like

healthcare, beauty, hospitality and more, participating in it directly or otherwise. The young population; emerging middle class; rising disposable incomes; and growing consumer interest in health, travel, and new experiences are all fueling strong demand—leading the Indian wellness industry on a growth trajectory. India's wellness market in 2015 was estimated at approximately \$13 billion and it is expected to grow at a CAGR of nearly 12% for the

next 5 years.³⁰⁸ The industry can achieve about \$23 billion by 2020.³⁰⁹ The rural population too is joining the mainstream with improvement in linkages with the cities by roads, telecommunication and the firms reaching out to the people in villages and small towns.

The wellness market offerings are segmented on the basis of services as follows:

Segments	Services
Beauty Care	Salons and Beauty Centers, Cosmetic treatments
Alternate Therapy	Treatment Centers for Ayurveda, Homeopathy, Unani, Naturopathy, etc.
Spa & Wellness Centers	Spas & Rejuvenation Resorts
Nutraceutical	Dietary Supplements and Functional Foods
Fitness Products & Centers	Fitness Centers, Slimming Centers, Gyms

Beauty Care

Increasing awareness and growing aspirations of consumers to look good has opened up the beauty and wellness market. Currently, it is estimated at \$6.5 billion with a focus of moving the sector towards a more organised space.³¹⁰ This sector is expected to grow with a CAGR of 24% in next ten years posing huge growth opportunities for FMCG and other companies.³¹¹ We are also seeing a shift in consumers from modern beauty methods to traditional remedies, including herbal, Ayurveda etc. A few of the factors driving growth in this industry are as follows:

01. Demographics of India, approximately 60% population are in the age bracket of 15-54.³¹² Interestingly, there is a rising aspiration among Indian/India's men towards the beauty care which has resulted in a growth of 42% in the last five years in the men's grooming market.
02. Easy access to beauty and wellness products through online shopping; currently around 62% young consumers buy online in metro cities.³¹³
03. Increase in the number of beauty salons and spas in the country.
04. Rise in awareness and availability of Herbal and Ayurveda products.

Alternate Therapy

India has an unmatched heritage represented by its ancient systems of medicine which are a treasure house of knowledge for both preventive and curative healthcare. Under its prime focused 'Make in India' campaign, government is giving impetus to meet the rising demand in India and abroad for the ancient healthcare systems. The Government of India has set up a dedicated Department of Yoga, Ayurveda, Naturopathy, Unani, Siddha and Homoeopathy (AYUSH). The department is entrusted with the responsibility of developing and propagating officially recognized systems, namely, Ayurveda, Yoga, Naturopathy Siddha, Unani, and Homoeopathy.

The AYUSH sector has an annual turnover of approximately \$2 billion.³¹⁴ The sector is dominated by micro, small and medium enterprises, accounting for more than 80% of the enterprises, located in identifiable geographical clusters.

SPA & Wellness Centers

Substantial expansion in travel and tourism industry as well as a rise in income has made Spa as one of the fastest growing industry in India after America and Europe. Annually, Spa industry in India is

generating approximately \$0.6 billion. India will continue to be a hot spot for medical tourists that seek travel services that incorporate diverse wellness packages.

The India's Spa Industry is relatively young by global standards, however, it is also the home to key pillars of the ancient and modern spa industry, Ayurveda, Yoga, Meditation, etc. Such very authentic services related to the country can be incorporated at a level not as easily obtained around the globe.

Regionally, it is mainly dominated by North India followed by Mumbai in West. South India is more known for its Ayurvedic flavor. Thermal bathing, advanced beauty treatments, medi-spa services, and male grooming are becoming increasingly popular around the world. However, India has yet to fully explore application of these trends within its own spa and wellness market. Horwath Health and Wellness strongly believes that, in India, financial opportunities exist beyond luxury hotel spas. The fact that Ananda in the Himalayas, located in Narendra Nagar, Uttarakhand, is India's only currently operational destination spa of global repute clearly demonstrates room for growth in this market segment.

On the other hand, the large domestic audience also likes to experience 'western/modern/foreign' spa and wellness modalities. So, a clearly identified and well-structured differentiator for every respective spa needs to be developed. Drawbacks are the scarcity of trained team members and the missing know how of modern management of spa's services and processes. In addition, Indian developers tend to call in specialists (like us) far too late, thus leading to not always well conceptualized spas.

Nutraceutical

Riding high on around 20% annual growth in past six year, the nutraceuticals market in India is expected to double to \$4.1 billion by 2020.³¹⁵ Drug Marketing and Manufacturing Association (DMMA) estimates that the nutraceutical industry is likely to grow by 16% CAGR over the next five years. Rise in lifestyle diseases such as diabetes, blood pressure, obesity and cardio vascular problems are driving the high demand of nutrition supplements. Currently this market is dominated by multinationals and pharma giants. The sector also has issues regarding quality, consistency and compliance. Therefore, there is a strong push by the industry association towards encouraging small players to create sufficient infrastructure to meet labelling, global manufacturing practices and quality control norms so that they are able to compete with bigger players.

Fitness Products & Centers

The health and fitness industry in India is poised at an inflection point and is chiefly driven towards wellness, fitness, presentability, and confidence. Fitness industry in India is worth \$1.1 billion and is expected to cross \$1.1 billion by 2017.³¹⁶ The market penetration rate in India is as low as 0.5% and is mainly fragmented with majority of the market dominated by unorganized and independent gyms. The organized fitness market is concentrated in top eight cities of India—Delhi NCR, Mumbai, Bengaluru, Chennai, Kolkata, Pune, Hyderabad and Ahmedabad with more than 60% of top companies located here. While the market will continue to

grow in these cities, high real estate costs will drive players to look at tier 2 and 3 cities for growth. Hence, a higher growth in the premium and mid-end of the market is anticipated.

Growth drivers for the industry

- An emerging global middle class with rising disposable income and favorable (young) demographics focused on improving the quality of life and their future outlook.
- An increasing consumer interest in maintaining and improving lifestyle and health and moving from curative to preventive healthcare
- A collective, growing awareness and education among the consumers around wellness.
- A strong support by the Government by recognizing "Wellness" as one of the priority sectors in its Make in India campaign.
- An increasing interest in natural remedies and old traditions of Ayurveda, Yoga, Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) and herbal products. A vast reservoir of natural flora and fauna and also ancient texts and knowledge that have made it an authority in the field of AYUSH.
- A global trend of seeking experiences that are rooted in authenticity and nature therefore leading towards a global recognition of tradition India wellness practices.
- A rising cost of unwell workers is encouraging the employers to spend more on employee wellness as a means to lower healthcare costs, improve morale and recruitment, raise productivity, and stay competitive in the market. As companies increase their workplace wellness expenditures, it generates many related business opportunities, including a proliferating number of third-party providers that supply services, products, and platforms (e.g., screening assessments, diagnostic tests, incentive programs, wearable devices, counselling services, etc.)

- A vast infrastructure with a dedicated Central Council of Indian Medicine, Central Councils of Homoeopathy (Regulatory Councils) and five Central Councils for Research, one for each AYUSH system. There are seven National Institutes (two for Ayurveda and one each for other systems), two North-eastern institutes to cater to needs of a specific area, two Pharmacopoeia Laboratories, one Pharmacopoeia Commission for Indian Medicine, a National Medicinal Plants Board and a public sector undertaking for manufacture of standardized Ayurveda and Unani medicine.
- An increasing inbound tourism from the USA, UK, Australia, and UAE for Ayurveda, Yoga, etc.
- A strong growth in wellness tourism, faster than global tourism, as more consumers aspire to higher levels of wellness and incorporate this intention into their travels. India is ranked 12th in the Global Wellness Tourism ranking in 2015.
- Switzerland recognized CAM (complementary and alternative medicines) in its public health system in 2009. The recognition of Ayurveda in Swiss public health system exemplifies its efficacy in the public health system and therefore it could be replicated in other countries of the world.
- CAM has witnessed an increase in use in recent times not only in North America, Europe and Australia but also in Asian countries including India.³¹⁷

Competitive profile

Characteristics of the stakeholders and key growth drivers of the wellness market/network are as follows:

- Consumers:** Consumers mainly comprise young population with rising income levels. Increasing need to look good and feel good has led these young consumers to seek wellness solutions to meet lifestyle challenges.
 - Indian youth (in the age group of 15 to 34 years) is the core target group, comprising over 34% of the total population. This is expected to cross over 400mn by 2016 and

forms the core target group for wellness products and services.³¹⁸

- India's growing middle-class is fueling demand for wellness products.
- Increase in discretionary spends is positive for the industry.
 - Rising incomes are resulting in increasing discretionary expenditures.
 - Aspirational products and services are finding many takers.
- Growing urbanization is resulting in higher awareness levels.
 - The urban population constituted 28% of total population in 2001, this is estimated to increase to 37% in 2025.

B. **Providers:** Providers offer wellness services and products to meet the hygiene, curative and enhancement needs of the consumer. Wellness services bouquet accounts for 40% of the total wellness market in India. The beauty care market comprises of cosmetic products, salons and cosmetic treatment centers

- The nutraceutical segment comprises of Health & Wellness Food and Beverages, Dietary supplements.
 - Health and wellness food and beverage's includes three sub-segments; Fortified foods and beverages (FFB), Naturally healthy (NH) products, Better for you (BFY) products
- The spa and wellness centers segment is in the nascent stage but growing rapidly.
 - The industry is highly fragmented with no clear industry leader and there is an opportunity for new players to create value in this segment

C. **Adjacent industries:** Adjacent industries such as healthcare, hospitality, education, media, retail and gaming are capitalizing on the growth of the wellness sector to generate additional revenue streams, leverage existing competencies and offer a wider array of services/products to customers.

D. **Facilitators:** Facilitators include employers, insurance companies and schools, who are likely to play a key role in encouraging and inculcating pro-wellness habits among consumers going forward. Employers, too, have started providing a supportive environment to promote wellness as part of employee's lifestyle.

E. **Government:** The Government wears multiple hats in its roles as a provider, facilitator, enabler and regulator in the industry. Recognizing the importance of this industry, the Government has already initiated some measures to stimulate growth.

Government initiatives

- **Make in India:** In India, a separate Ministry named AYUSH has been formed, which will have a Department for YOGA. The market has the potential to generate three million job opportunities. India is also the second largest exporter of Ayurvedic and alternative medicine in the world. The country has also developed vast AYUSH infrastructure comprising of 736,538 registered practitioners.
- **Skill India:** A national level initiative with the partnership of the government, employers and other important stakeholders to create and lead a skill development initiative for the beauty and wellness industry has been envisaged. Beauty and Wellness Skill Development Council (BWSSC) established to ensure the generation of skilled manpower in the sector, create career paths in roles existing within the unorganized and organized segments of the Beauty and Wellness industry and ensure active participation of the different stakeholders, i.e., Industry, Academia and learners to ensure a holistic development of skilled manpower.
- **Digital India:** National Health Portal to provide general information on health and diseases and multiple mobile apps such as the Swasthya Bharat App have been initiated.³¹⁹

Conclusion and recommendations

As more people around the world turn to wellness focused activities and lifestyles to mitigate their mounting stress and deteriorating health, the wellness economy is positioned to expand at a healthy pace. Wellness sectors are positioned to grow as an increasing share of the India economy, propelled by demographic and consumer trends, as well as an evolving collective consciousness toward global wellbeing. Given the potential in this sector, a gradual improvement over the below aspects would surely lay a strong foundation to tap this uncommon sector, with high potential business opportunities:

- **Skilled manpower:** There is an urgent need to skill the workforce and standards need to be defined which should be followed across the industry. Private players can work with government to formulate guidelines on education and training institutes.
- **Minimum wage rate:** There is need to fix the minimum salaries for different levels of training with standard pay scale for skilled manpower.
- **Curb malpractices:** To create strong industry lobby to liaison with government for better monitoring and compliance within the industry. Further, a team should be setup to conduct surprise checks on a regular basis to check the usage of sub-standard, ineffective and harmful products by service providers with a view to regulate costs.
- **Introduce quality norms:** Government should define quality norms to bring standardization and uniformity within the industry.
- **Awareness campaign:** Consumer awareness programs in the form of road shows and media channels to advertise benefits of accredited and non-accredited center.

20. Facility Management Industry profile



Facilities management services revolve around people. It involves maintaining and managing the building facility and carrying out several non-core business activities for the organization. These include hard services like management and maintenance of an entire building facility, soft services or business support services, and energy management services. Services in this sector can range from a single service, bundled service, or an entire range of business support functions for the client organizations.

The facility management services spans across sectors - infrastructure, manufacturing, IT, and other services (along with future investments). Among end-users, IT/ITES/ BFSI contributes more than 21% of revenue generated by the facility management services market due to the recent boom and investment in the segment. Other sectors like healthcare, retail, manufacturing, and infrastructure are also gaining momentum because growth is stemming from increased investments and initiatives undertaken by the Government of India.

Global facility management market was estimated at \$1.12 trillion in 2016. The US leads the sector with some of its large multinationals present worldwide. It is expected that the Indian market for

facilities management will grow at a CAGR of 17% and reach \$19 billion by 2020.³²⁰ The Indian facility management services market is largely unorganized in the current state of things.

Facility management services are primarily concentrated in and around metros with low penetration in Tier II and Tier III cities. This is due to the presence of a majority of office facilities, building spaces, and developed infrastructure in these areas. Among all Indian cities, the two cities of Mumbai and Pune contribute the maximum share of over 20% to the facility management services market followed by Delhi-NCR and Bangalore.³²¹

Within the end-user segments, information technology (IT)/information technology enabled services (ITES)/Banking, Financial Services, and Insurance (BFSI) occupy the maximum share of facility management services, followed by manufacturing and infrastructure sectors. The demand for facility management services is high with growing emphasis on urban development and modernization of office spaces. The Indian real estate sector is the major driver for the facility management services market. With advances in infrastructure facilities, any positive activity in the real estate sector will benefit the market in future.

With growth expected in the facility management market, several large multinational corporations are entering and looking to enter the market. Some of the leading US players are already operating in India.

Future prospects of the industry

- Businesses are constantly making efforts to ensure that their facilities and workplaces are properly maintained, focusing attention on the core business activities. Facility management vendors provide flexibility of outsourcing their non-core activities like heating, ventilation and air conditioning (HVAC), maintenance and cleaning, plumbing, and several other support functions.
- The facility management services market in India is slowly gaining momentum owing to the rapid infrastructural growth expected in the forecast period. The facility management sector will strengthen its hold in the services sector and penetrate into other developing sectors like manufacturing, healthcare, and retail.
- The growth in BPO, IT, and ITES sectors has stimulated the demand for facility management services in India. The country is the world's largest IT industry, accounting for approximately 65% of the

Figure 66: Facility Management Services in end user industries

IT/ITES/BPO/BFSI	<ul style="list-style-type: none"> • Electrical services like HVAC and maintaining power stations for office buildings • Water management for regulating water usage in canteens and washrooms • Housekeeping • Security • Pantry and cleaning
Manufacturing	<ul style="list-style-type: none"> • Operation and maintenance of HVAC systems • Energy management for utilities • Soft services like security, pantry, transportation
Retail	<ul style="list-style-type: none"> • Electrical and mechanical services • Housekeeping • Security
Healthcare	<ul style="list-style-type: none"> • Electrical maintenance of OPD, ICU, and other critical areas • Housekeeping • Pantry and cleaning
Infrastructure	<ul style="list-style-type: none"> • HVAC • Housekeeping • Security
Government	<ul style="list-style-type: none"> • Housekeeping • Catering • Security
IT/ITES/BPO/BFSI	<ul style="list-style-type: none"> • Electrical and mechanical services • Security • Housekeeping • Catering and cleaning • Horticulture • Transportation

global IT market. Various hard services and soft services are required in most of the offices, resulting in a bright future for the facility management services market. It is projected that by 2020, an additional 325 million sq. ft. of land in Tier I cities and 300 million sq. ft. of land in Tier II and III cities for office space would be created in the IT/ITES industry. The rapidly expanding office spaces in IT sector signals positive signs for the facility management industry. Facility management services in the industry have gradually transformed their role from an outsourcing service arm to a more solution-based channel for business enhancement. With advances in technology, it is expected that facility management services will evolve from workplace management to cloud-based solutions and services underlined by Computer Aided Facility Management.

- Big and established vendors can cater to a wide variety of facilities services compared with small and local vendors. Technology will also play a decisive role in ensuring delivery capability of facility management services, encouraging the need for constant technological upgrades. Facility management has become a tool that allows businesses to integrate their noncore activities, focusing attention on core activities.

Government Initiatives

The various policy initiatives such as RERA (The Real Estate (Regulation and Development) Act, 2016), GST, Infrastructure Status for Affordable Housing, coupled with a strong infrastructure development plan, is making India an attractive destination for foreign companies to set up operations in the country.

Conclusions and recommendations

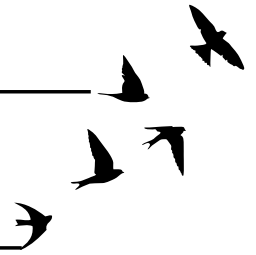
- Within the next few years, the facilities management and real estate industries will experience a considerable increase in the demand for outsourcing, integration and globalization of services.
- Among all service lines, facilities management services are—and will continue to be—the most highly integrated industry purchase.
- Increasing competition coming from new players in emerging markets will force companies to search for greater differentiation, and to be innovative in how they adjust their business models and deliver extra value to clients.
- Global warming will be one of the main sustainability challenges for the coming century. To become more energy and carbon-efficient, societies around the world may be forced to restructure their economies and infrastructure. Technological development is squeezing low-quality labour out of the market and creating new demands for skill sets. People and organizations expect tailored products, services and solutions.
- Companies expect their facility management and services industry providers to supply individualized services that maximize their value proposition. Additionally, companies will experience increasing employee turnover. Individualization will be prominent as employees and customers increase their demands for individual attention.
- Corporations are implementing alternative workplace practices and new ways of working to promote corporate identity and foster more efficient collaboration, knowledge sharing, flexibility, speed, innovation, and productivity.
- Introduction of foreign players in this market is expected to increase in the coming times. The next wave of urban development will occur in areas already prone to natural disasters. Facility management and services industry managers should prepare contingency and continuity plans for a number of challenges.
- Government regulations including Private Security Agencies (Regulation) Act 2005 and Foreign Direct Investment Policy and Goods and Services Tax is building the foundation for a key segment of this sector.

- The Industry is moving towards consolidation and 'Integrated Facility Management Services' is the emerging trend. Even customers are more comfortable with a single vendor providing multiple services rather than dealing with multiple vendors. The integrated services approach gives major cost benefits to the facility management company as well as to the customers, making it a win-win situation for both. The growing regulatory and compliance requirements have furthered the case of integrated services and customers are happy to rely on the service providers to take care of these unwanted regulatory complexities.

The government is also looking towards professional facility management service providers rather than relying on in-house manpower. The government is becoming more and more stringent with its quality and delivery parameters. This is a welcome change for the professional facility management service providers as it opens more avenues for them in the government sector. Also, with infrastructure development being one of the major focus of the government, the facility management industry is set to grow with leaps and bounds as every new infrastructural facility needs a facility manager.

21. Exhibition and Event Services

Industry profile



Exhibitions are a medium for effective promotion of businesses, products, and services. They help in lead generation and are more effective than advertising campaigns such as online banner adverts and newspapers. Companies that participate in the events, maximize the return from the events by combining it with various marketing techniques such as direct mail, public relations, and e-newsletters. An event is a forum for interaction of prospective buyers and sellers.

Business to consumer (B2C) and Business-to-business (B2B) exhibitions held worldwide help provide a platform to promote products and services to a wide group of target customers. Vendors organize exhibitions to provide interaction between the exhibitors and the prospective buyers. Exhibition organizations stage and manage exhibitions. They select the venue and make provision for facilities and logistics.

The interactive forum enables sellers to pitch their products according to the preferences of the customers.

Global exhibition market was estimated at \$55 billion and attracts around 260 million visitors annually. It is growing at a significant rate worldwide. The market is poised to witness a huge demand in the APAC region and the MEA region. The US, Germany, France, the UK and Spain are top 5 countries in the world in organizing meetings.

The Global Exhibition Organizing market generates revenue from the organizations of the following exhibitions: One-time events and permanent facilities. These exhibitions are not recurring in nature and are conducted for a few months or may be prolonged for years. Exhibitions which are recurring in nature, are conducted in permanent facilities and have a dedicated exhibition centre.

Indian event industry is projected around INR 960 billion (\$14.5 billion) growing at the rate of ~5.2% year-on-year.

MICE (Meetings, Incentives, Conventions and Exhibitions) tourism is growing and contributing significantly to the global tourism industry. The entire world has witnessed the immense potential of MICE Tourism. The government is working towards promoting India as a

MICE destination. India has major MICE centers located in New Delhi, Mumbai, Agra, Bangalore, Chennai, Cochin, Goa, Hyderabad, Jaipur and Kolkata. Also major 5 star and 7 star hotel chains at these locations have excellent facilities for such activities.

Growth drivers for the industry

The Global Exhibition Organizing market is largely driven by an increase in the need for specialized, effective, and high-quality exhibition events, which would attract international buyers to take part in local exhibitions. Social media and search engine marketing are also driving the growth in the sector. Ministry of Tourism is emphasizing on the potential of MICE Tourism and the new tourism policy has identified it as an important product to increase tourism revenue.

The exhibitions provide a platform for increased brand awareness, media exposure, networking, and competitive monitoring. They enhance direct interaction between buyers and sellers, which is essential for doing effective business. The exhibitions could generate ancillary services, new clients, and partnerships.

Figure 67: Drivers in the Global Exhibition Organising market



Source: Deloitte Analysis

'The Exhibition industry is growing at a robust pace in developing countries such as China, India, Brazil, Russia, and South America. However, the Exhibition Organizing market in China is larger than other developing countries. This is mainly because the country has stable economic growth, and has a higher demand for the Exhibition industry.

Conclusion and recommendations

Despite these challenges, the Global Exhibition Organizing market is growing significantly because of some emerging trends. Increased innovation in exhibition formats is one of the trends. These innovations allow organizers to offer a customized experience to buyers and sellers by strategically bringing them

together. The innovations reduce the probability of disinterested parties interacting with each other, thereby increasing the throughput for the exhibitors. Both social media and search engine marketing have a strong effect on the Exhibition industry and are also expected to drive the market during the forecast period.

Overall, the market will continue growing at a high rate during the forecast period due to an increasing number of organizations establishing themselves in developing countries. Supportive government policies and regulations, outstanding infrastructure for MICE and connectivity with other major destinations worldwide would strengthen growth.



Emerging Opportunities

1. Cyber Security

Industry profile



Cyber security is related to securing and preventing unauthorized access of any enterprise asset in which digital data can reside or transcend. The key principles on which cyber security operates on are

- **Secure:** securing and reducing the risk to the asset
- **Vigilant:** monitoring the enterprise and the assets continuously to ensure that there are no threats and
- **Resilient:** ensuring the resilience of the asset, to self-heal or be able to recover to original state in case of a compromise.

The Assets can fall into the area of information technology, communication Infrastructure, Internet of Things (IoT), physical access and other digital assets through which Digital Information can transcend

Defense and military, government, financial institutions and corporation etc. collect and store confidential information on computers and transfer that data across networks. In order to protect this data and information from being compromised, cyber security becomes necessary. Increasing threats such computer intrusion (hacking), virus deployment and denial of services are increasing the demand for cyber security solutions and services.

Market trends

There are a number of trends that are creating a need for a focused effort to solve cybersecurity issues:

- **Increased sophistication & number of attacks:** Despite company efforts, these attacks continue. Clients agree they need to change the way they defend against and recover from cyber-attacks.
- **Rising costs:** It used to be that a cyber breach would cost only the company remediation but now the costs are increasing with the average cost \$6.75 million.
- **Increased mobility:** Companies IT infrastructure continues to extend beyond the walls of their data center. With Bring Your Own Device, business partnerships, mobile and cloud proliferation, data is increasingly exposed to higher risks.
- **Underdeveloped cybersecurity workforce:** With the increase in sophistication of attacks companies find it easier to outsource cyber services to firms who can leverage resources for many clients, thereby decreasing costs while retaining expertise.
- **Changing regulations and guidelines:** Governments around the world are implementing more stringent regulations.

• Rising risks

- **Social Media Risks:** Social media can be a valuable sales and marketing tool. Inherent in these applications are security risks that can put the individual or a company in a compromising position or at serious operational, regulatory as well as reputational risks.
- **Cloud Infrastructure Risks:** Lack of best practices on the method and content of a cloud services risk assessment. Non-transparency of service providers presents challenges to security professionals charged with assessing the risk of cloud services. Poorly defined business requirements on the part of cloud services buyers create additional areas of potential risk.
- **Malware Follows Users to Mobile:** With increase in usage of services through mobiles and tablets, malware pose a threat even to the mobile devices. With these networks growing more and more common, with increase in complexity, keeping a check on the spread of malware has become an increasingly difficult task.

Market segments

The Cyber Security market can be broadly segmented into three major types into

• Security Original Equipment

Manufacturer (OEM): The cyber security ecosystem comprises cyber security OEM's such as Intel Security Symantec Corporation, Hewlett Packard Enterprise, IBM Corporation, Cisco Systems, Inc., Rapid7, Inc., EMC RSA, FireEye, Inc., Trend Micro, Inc., Sophos Ltd., service providers; system integrators; and enterprises.

• Services:

This sub-segment includes consulting – risk and compliance, design and integration, training, analytics, forensic, etc. Other service providers include security service providers, IT service providers, resellers and technology providers.

• Applications & Solutions:

This sub-segment has solutions categorized in the following broad categories namely risk and compliance, identity and access, information leakage and rights management, Infrastructure management (firewall, encryption, PKI, anti-malware and anti-virus, web filtering, DAC, IDS, etc.), Threat & Incident management, vulnerability management, resilience and business continuity and analytics/correlation. This sub-segment

further gets segmented based on customizations and needs of specific Industry sectors and regions.

Market size

While it is intuitive to understand the expanding market size of Cyber Security, it further gets validated by several research / reports:

- The global cyber security market size is estimated to grow from \$122.45 billion in 2016 to \$202.36 billion by 2021, at a CAGR of 10.6%.
- According to Data Security Council of India (DSCI), the Indian Cyber Security market is expected to grow nine fold from \$4 billion to \$35 billion by 2025.
- Government spending has increased at an average annual rate of 14.5% from 2006 – 2017, outpacing investments in any other program, according to Scott Homa, Senior Vice President for Mid-Atlantic Research at Jones Lang Lasalle (JLL).
- A 2016 report from BI Intelligence, estimates that \$655 billion will be spent globally on cyber security initiatives to protect computer systems, mobile devices, and IOT from 2015-2020.

Opportunities

The growing concern over geo political issues, regulatory matters, organized cyber-crime and rising adoption of digital technologies like social, mobile cloud, and IoT, etc. that further increase the risk of compromise, provide new frontiers and growth opportunities for Cyber Security. India's large pool of cost effective English speaking talent (with proven capabilities in ITES, BPO, KPO types of services), rising smartphone and internet penetration, along with public sector investments in digital economy initiatives in India would enable the industry address domestic and global opportunities in Cyber Security.

The rise of Uber, AirBnb, etc. which have disrupted/transformed their respective sectors, has been an awakening call for several enterprises across the world and this has caused rapid acceleration of disruptions / adoption of digital technologies like social, mobile, cloud, and IoT, etc. as businesses strive to be competitive and relevant.

These businesses in their desire to Uberize within and become more Digital in an accelerated window of time, further increase the risk of compromise, thus providing new frontiers and growth opportunities for cyber security.

Cloud Services

- Global Cloud Market \$208.4 billion
- Indian Cloud Market \$ 16 billion by 2020
- Growth Drivers for IT Services
- Digitisation
- Payment Sector
- Government Services
- Aadhar, e-KYC

IoT

- Global IoT Market Size: \$1.7 trillion by 2020
- Indian IoT Market Size: \$15 billion by 2020
- Growth Drivers for IT Services
- High IoT Security Spending (348 million in 2016)
- Security Services

Cyber Security

- Enterprise security spending(hardware, software, services) in India is around 1.12 billion in 2016, upto 10.6 percent from \$1.01 billion in 2015 and is expected to reach \$1.24 Billion In 2017
- As per Gartner, India Security Market is expected to grow 10.6 Percent in 2016

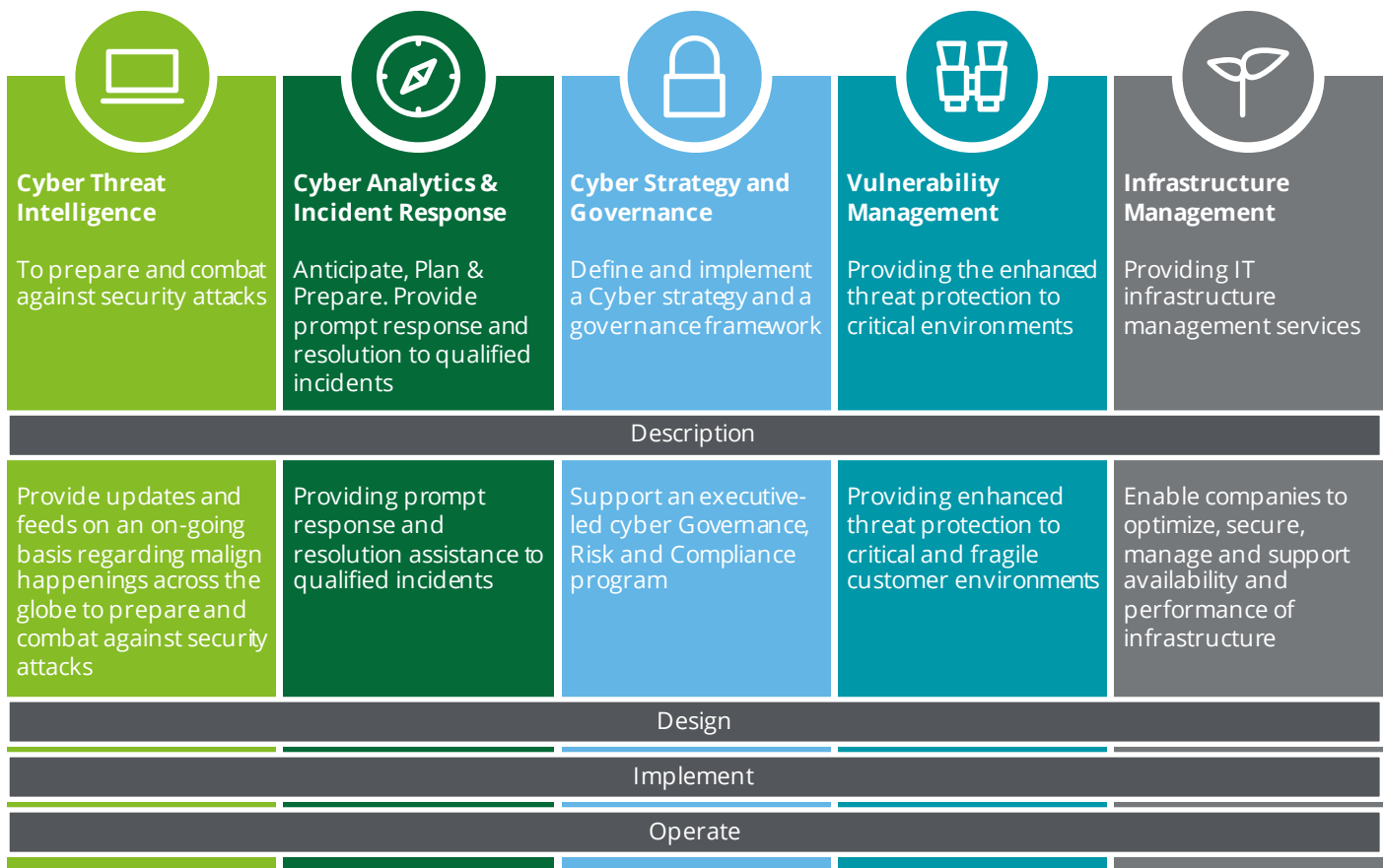
The market in India has a high potential of growth driven by digital economy initiatives of the government, along with digitisation and automation. The digital transformation drive by government creates huge demand for cyber security services in the country and provides new opportunity for the vendors. Further mature markets such as Americas and EMEA where there is a severe shortage of cyber security professionals and additionally the emerging markets like APAC, Middle East & Africa which face similar challenges, provide new opportunities for growth for Indian cyber security vendors.

Competitive landscape

As one analyzes the cyber security competitive landscape, one can draw an analogy and learning from the technology and business process outsourcing industry, where Indian vendors face competition from both large global service providers as well as niche firms. Further in this space Latin America and Eastern European countries traditionally compete with India for near-shore and offshore delivery infrastructure and countries like Philippines, Vietnam, Malaysia, and Indonesia are also destinations for delivering cost effective IT/BPO services.

Conclusion and recommendations

Cyber security is no different, we will face competition from all fronts. We as a country need to capitalize on the advantages that we have and rapidly accelerate our capabilities and capacity in the cyber security space by offering a complete portfolio of services to assist enterprises establish their cyber security programs, and assist them in the ongoing management and monitoring of these programs, and continue to be trusted advisor who partakes in their business transformation and assist in managing of cyber risk as the threat environment constantly evolves. The complete portfolio is described below:



In this journey of race to the top, India needs to position itself as the security provider to the world, by building an ecosystem of cyber security services, solution and technology providers. This segment will need further incentives to incubate and grow at a rapid space to capture market share from the competition. Thus India should take bold steps in the following:

- **Cyber Skilling India:** Revisit the curriculum at school and colleges and revamp it to adapt to the changing needs and establish a strong foundation in cyber security at a very early stage. Further incentivize private and government training institutes to establish and impart re-skilling of cyber security training to the vast pool of professionals in existing work force. This will create a vast pool of skilled workforce that can be used to support domestic and global needs.
- **National talent search:** Create the ability to constantly search and identify the best talent across the country and provide them state of art facilities to further enhance and develop their cyber security skills and contribute to the nation and the private industry.
- **Ease of doing business in India:** Simplify procurement processes within the government, to provide a major boost to the domestic security industry and help security service providers address emerging digital economy opportunities in India.
- **Cyber Security Incubation, R&D and #MakeInIndia:** Create cyber security parks or expand the mandate of STPI, SEZ etc. and create special incentives for creating products intellectual property, innovation of services in cyber security areas. This will help Indian companies innovate and provide cost effective security solutions and services (#MakeInIndia) for the global markets, which is currently dominated by the US and European vendors.
- **Data Protection, Ownership and Jurisdictional Rights:** As India embarks on being the security capital of the world, providing managed security services from state of art cyber security centres, we should consider provide explicit Data Protection, Ownership & Jurisdictional rights to businesses who may want to have their data reside in India, as a logical extension of their own country. This will further turbo-charge the adoption of remote cyber security centres.
- **Authentication as a Service:** Authentication will continue to be a challenge across the world. Leveraging the state of art authentication capabilities and significant scale established by the Government of India for the Aadhaar environment, we should explore the opportunity of establishing a trusted environment to provide authentication as a service across the world.



2. Northeast India

Industry profile



Northeast India comprises eight states—Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura,

and Sikkim. It is one of the most resource rich regions in the country and is endowed with a diverse range of natural resources.

Some of the driving factors are discussed below:

Driving factors for NE



Strategic Location

- The region has a long international border of almost 4500 km and shares border with – Bangladesh, Bhutan China, Myanmar and Nepal
- It has potential to be developed for boosting trade with ASEAN countries



Affordable Labour

- Most state in North East have an education index above 60 and the level of education is alleged to be higher than that in other parts of the country
- Presence of a youthful population and labour at affordable rates



Natural Resources

- Presence of a diverse range of natural resources and crops – tea, bamboo, etc.
- Almost 52% of the region has forest cover and has abundant water resources
- NER supplies 10% of the gas and 12% of the oil requirements of India



Cultural

- Each of the eight states offers its distinct culture and heritage
- There are 3 UNESCO identified world heritage sites located in this region
- NE Tourism Circuit being developed under the Swadesh Darshan scheme



Government Focus

- Plans of investing INR 920 billion for development of roads and railways
- Under the “Special Accelerated Road Development Programme in North- East (SARDP-NE), the Trans-Arunachal highway is being developed
- Each Central Ministry is required to spend 10% of its budget in the North East
- Government has a INR 1.3 trillion plan to double O&G production in NE

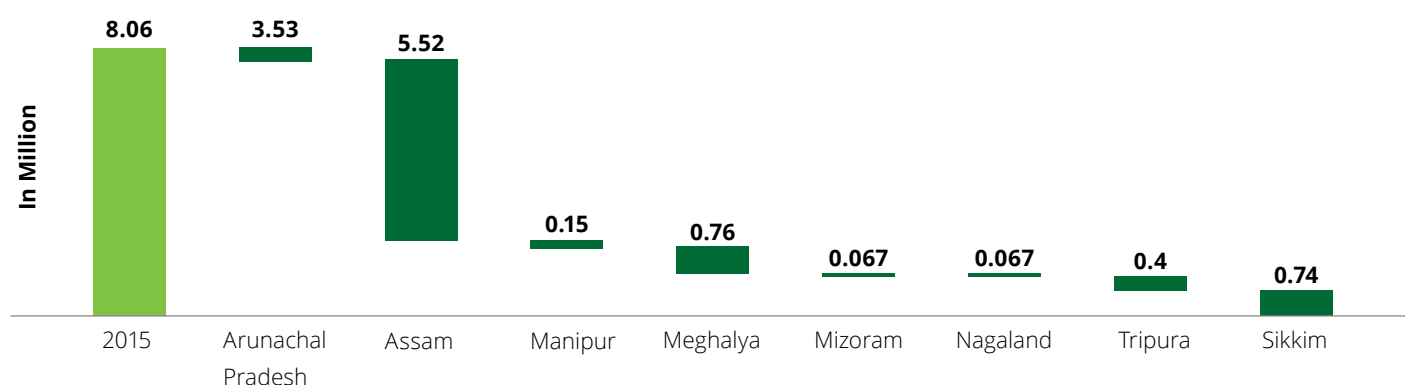
Combining the strengths of the Northeast region and the focus of the Central Government, certain industries (Tourism, Logistics, Food Processing, IT & ITES) with potential for attracting investment in the Northeast region have been detailed in this document.

Tourism in Northeast

Northeast India comprises eight states namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim. The location of the region is strategically important as it shares its border with Bangladesh, Bhutan, China, and Myanmar. The natural beauty of the place, rivers and mountains, Buddhist monasteries, serene natural environment, exotic flora and fauna, unique tribal culture,

folk dance and music in the Northeastern region together offers an opportunity for development of tourism in the region. Each state in the region has its own distinct feature and together the region is endowed with diverse tourist attractions. Of the 35 UNESCO identified World Heritage Sites in India, three are in this region—Kaziranga Wildlife Sanctuary and Manas Wildlife Sanctuary in Assam; and Khangchendzonga National Park in Sikkim.

Figure 68: Total number of tourist arrivals in North East India in 2015 (in million)³²²



Source: Annual Reports of Ministry of Tourism, Government of India

The number of tourist arrivals in Northeast India has increased from 6.43 million in the year 2011 to 8.06 million in 2015 at a CAGR of almost 5.8%. In the last few years there has been a steady rise in the number of domestic and foreign tourist arrivals in the region, however Northeast India still accounts for less than 1% of the total tourist arrivals in India. This may be attributed to the lack of proper infrastructure, inadequate marketing, and scarcity of skilled manpower and absence of a broad tourism policy for the region as a whole.

Government initiatives

The Ministry of Tourism has taken a plethora of initiatives to promote tourism in the country and specifically in Northeast India. From formulation of the National Tourism Policy 2015 to introduction of new initiatives like Swadesh Darshan and PRASAD many steps are being taken to boost the tourism industry. The Ministry has also set up a Hospitality Development

and Promotion Board to monitor and facilitate hotel project clearances. Some of the key initiatives are mentioned below:

- Introduction of the Swadesh Darshan scheme to promote theme based tourist circuits in the country. The Northeast India Circuit (Paradise Unexplored) has been identified as one of the twelve thematic circuits under this scheme. Infrastructure projects amounting to around INR 3.5 billion has already been sanctioned under this scheme for the Northeastern region.
- Introduction of the PRASAD scheme (Pilgrimage Rejuvenation and Spiritual Augmentation Drive) to promote places with pilgrimages. Kamakhya in Assam is one such center identified.
- 10% of the plan allocation of the Ministry of Tourism is earmarked for North East India.
- Provision of complimentary space to the Northeastern states in India Pavilions set up at International Travel Fairs and Exhibitions.
- 100% central financial assistance to the Northeastern states for organizing fairs and festivals.
- Ministry of Tourism, as part of its ongoing activities undertake several outdoor media campaigns in the international and domestic market to promote various tourist destinations. It undertakes special campaigns on Northeast region to promote tourism in this region.
- International Tourism Mart (ITM) is organized annually with the objective of showcasing the largely untapped potential of Northeast India in the domestic and international markets. Already four ITMs have been conducted so far.

- Five year tax holiday for two, three, and four star category hotels located around UNESCO world heritage sites in India. Three such UNESCO sites exist in this region—two in Assam and one in Sikkim.
- A six week training program has been launched for the age group 18-28 years to achieve better tourist satisfaction in terms of availability of skilled tourist facilitators in Northeast.

Future prospects for the industry

- Niche tourism sectors like medical tourism, eco-tourism, and wellness tourism offer good opportunities in the tourism industry. Northeast has a plethora of attractions to be developed for niche tourism.
- Development of the tourism sector has potential to benefit other ancillary services providers such as facility management, banking and financial services providers, and entertainment service providers.
- Northeast India has been largely untapped till date and the focus of the Central Government on this region under the Swadesh Darshan and Prasad schemes will provide the requisite impetus to tourism related infrastructure projects in this region. In 2016 alone, four projects have already been sanctioned.
- Skill development initiatives targeted for tourism will create requisite talent pool for the tourism industry in Northeast India and that too at affordable rates.
- The development of the Northeast India Circuit under the Swadesh Darshan is expected to generate greater demand for tourism and accommodation facilities. The expected increase in demand combined with the five year tax holiday offered to two, three and four star category hotels located around UNESCO World Heritage sites by the Government is expected to attract investment in this region.

Conclusion and recommendations

Investment in tourism and hospitality has been rising consistently. With the renewed focus of the Central Government

on the northeastern states of the country, this virtually unexplored region can be developed as a tourism hub based on different themes such as adventure, wildlife, eco-tourism, wellness tourism, cultural tourism, tea-tourism and pilgrimage. The region's proximity to the South-East Asian Tourism Hub is an added advantage.

Food Processing in Northeast

The North Eastern Region holds lot of potential for food processing as the weather and adequate availability of water are conducive to food cultivation and suitable for growing large variety of fruits and vegetables. The Central Government is trying to develop food processing sector in Northeast through its schemes of Mega Food Park, Cold Chain, Abattoir, and development of Food Testing Laboratories.

Government initiatives

The Government of India approved a package of fiscal incentives and other concessions for the North-Eastern region including Sikkim namely, 'The North East Industrial and Investment Promotion Policy (NEIIP), 2007', effective from 1 April, 2007, which envisages large number of incentives/subsidies namely, Excise Duty exemption, Income Tax exemption, Capital Investment Subsidy, Interest Subsidy, etc.³²³

- 3 Mega Food Parks have been sanctioned for this region, one each in Assam (which has been made operational), Mizoram and in Tripura.
- 5 Cold Chain projects have also been sanctioned in Assam, Manipur, Mizoram which have a capacity of 11500 MT of cold storage, 0.75 MT/per Hr. of IQF capacity and 68 Reefer Trucks.
- 8 Abattoirs projects have also been sanctioned which are aimed at establishing modern Abattoirs and ensuring hygienic and scientific meat processing.
- 6 Food Testing Labs for creating infrastructure for food safety and quality testing.

NERAMAC (North Eastern Regional Agricultural Marketing Corporation Limited) is considering setting up the following three projects—a Central Packaging Centre at Guwahati, multi-food processing plant at Silchar, Assam, and modernization of pineapple concentration plant at Tripura.³²⁴

Future prospects for the industry

- Northeast, and in particular the state of Assam, is the largest tea producing state in India. Development of blending and mixing services holds good potential in the region provided new infrastructure like that of the existing ICD (Inland Container Depot) Amingaon, Tea parks, etc. are developed in the region.
- The demand for organic products is growing and the North East region has the potential to become the organic farming hub of India. Sikkim has already turned completely organic and farmers in other region can be educated and supported to completely reject chemicals. This can create huge impetus to the setting up of various food processing services and organic value chains in the region.
- Agricultural extension programs are conducted in Assam for technology transfer to the tea growing farmers. Similar extension services can be provided to the food processing setups in order to improve competence of the farmers and adoption of new technologies.³²⁵

Conclusion and recommendations

There is a lot of potential around developing food processing industry in the Northeast, given its proximity to South East Asian markets, being home to diverse variety of fruits and other crops and the huge potential of organic farming in the region. The continuous focus of the Government of India in setting up modern infrastructure like food parks, export zones and cold chain and efficient policy making can make the North East one of the potential food processing zones in India.

Logistics in North East

Infrastructure snapshot of the north east region

Table 7: Key activities / services in logistics

	Transportation	Distribution	Import/Export
Plan	Network Design Carrier contracting Shipment optimization	Facility Design Project Management	Coordination of global freight movement
Execute	Carrier selection Shipment tracking Freight payment	Warehouse management Value added services	Customs clearance Freight forwarding

Source: IEEE³²⁶

Road: The North Eastern region has close to 8480 Km of National Highways³²⁷ running across the eight states (including Sikkim). The lion's share of freight movement across the region happens through roadways and movement across the Chicken's Neck region (the stretch of land connecting this region to the rest of India through Siliguri in North Bengal) has resulted in extreme congestion.

Rail: The railways network across the north eastern states is ~2600 km with broad gauge limited majorly to Assam.

Air: Civil aviation holds the key of not only connecting this region with the rest of India but also boosting trade and commerce (both within the region as well as providing

linkages to international trade). There are 11 operational airports (includes two international airports at Guwahati and Imphal) in the Northeast and 10 non-operational airports with one green field airport coming up in Itanagar.³²⁸

Waterways: The Brahmaputra River which flows through the region provides Assam with the largest network of navigable waterways in the country. Along with river Barak, which was recently was declared part of National Waterways (NW16), nine other rivers the Aai, the Subansiri, the Gangadhar, the Beki, the Dehing, the Dikhow, the Puthimari, the Kapili and the Dhansiri are being developed as a part of the national waterways³²⁹ where the state inland water transport department

operates ferry services. The current budget also proposed construction and operation of water taxis as one of the key projects in the region.

Growth drivers for the industry

- **Emergence of new hubs in tier-II cities:** Locations like Guwahati (Assam), Agartala (Tripura), and Imphal (Manipur) in north east are some of the key emerging hubs³³⁰ catering to the increasing demand across the north eastern states.
- **International Trade:** The region shares border with Bangladesh, Myanmar, and Nepal (BBIN Corridor) and has huge potential for improving trade with these regions and the entire South Asia.

Table 8: Snapshot of infrastructure in the North Eastern States of India

State	Roadways Length (Km.)	Rail Network Length (Km.)	Operational Airports	Non-operational Airports
Assam	2836	2434.99	6	1
Arunachal Pradesh	1992	1.26		5
Manipur	959	1.35	1	
Mizoram	927	1.50	1	1
Meghalaya	810		1	
Nagaland	494	12.85	1	
Tripura	400	151.4	1	3
Sikkim	62			
Total	8480	2602.35	11	10

Source: Ministry of Development of NER website and AAI Presentation on North East Connectivity Summit 2015

- **Growing E-retail segment:** Online sales in this region has seen considerable traction, especially in categories like music, apparels and books³³¹. The presence of a relatively young population has further accelerated this growth. With the penetration of online retail across all tier-II cities in India, there has not only been a sustained growth of existing courier players but also emergence of dedicated logistics providers. There is a lot of potential for growth for these players as they plan to invest in logistics services and manpower training.

Government initiatives

- **Railway Connectivity in North East:** The Northeast Frontier Railway zone has received a massive push from the government and is expected to complete connectivity across the states within 2020³³². Some of the key tracks in the region include:
 - Jiribam-Imphal, 110.63 km in Manipur
 - Badarpur (Assam)-Agartala (Tripura), 227 km in Tripura
 - Katakhal (Assam) to Sairang (Mizoram), 135.38 km
 - Tetelia (near Guwahati)-Shillong (Meghalaya), 129.9 km
 - Dhansiri-Zubza, 91.75 km in Nagaland
 - Harmuti (Assam)-Naharlagun (Arunachal Pradesh), 21.75 km
 - Sivok (Bengal)-Rangpo (Sikkim), 44.96 km
- **Development of multi-modal hubs:** The government is looking at development of multi-modal hubs including road, railway, ports and aviation and inland waterways which would act as great logistics hubs. Proposals to convert Inland Waterways Terminal in Jogighopa (Assam) into a multi-modal transport hub for cargo movement and trade between Bangladesh and Bhutan is currently under consideration by the government.³³³ Other locations which could be explored on similar lines include Dhubri and Badarpur in Assam.
- The government is also looking at developing a viable road network in this region by increasing the lanes of the existing ones and laying out new lanes through PPP model to improve connectivity.
- North Eastern Development Finance Corporation set up by the government to predominantly cater to the financial needs of the MSME sector in this region can resolve the working capital issue for businesses venturing in this industry.
- **Regional Connectivity** plan in airlines sector may not only revive the dormant airports (along with development of ancillary services industry) but will reduce commuting time in a cost effective manner - existing Guwahati Airport, Dibrugarh Airport, Silchar Airport, Agartala Airport, Shillong Airport, Imphal Airport, and Dimapur Airport to be; and upcoming new airports at Itanagar, Ceithu (Kohima), Pakyong (Gangtok) to be benefitted.³³⁴

Future prospects for the industry

- **Organized retail:** With emergence of organized players, key trends in the industry as seen in the last few years include:
 - Growing acceptance of 3PL (third party logistics) players
 - Government focus on providing support for cold chain and logistics industry
 - Emergence of 4PL players which are involved in management of 3PL players and looks at the entire supply chain of the organization
- **High quality warehouses:** With the development of new warehouses in emerging hub locations, most organizations are looking at bringing in global best practices and high standards in these warehouses. Improved warehouse management and tracking systems, automated conveyor systems fire sprinklers, etc. are expected to improve the standards of the warehouses as India prepares for post-GST operations.

- **Cold Chains:** Considering the current levels of food wastage and food security issues, there is a huge demand for cold chains in India. The segment is expected to grow at 28% CAGR to reach \$13 billion by 2017.³³⁵ The market is highly fragmented with organized players contributing only 8-10%. The segment has been given infrastructure status and FDI is allowed through automatic route to attract investments in this emerging sector.

Conclusion and recommendations

Development of transportation and logistics-related infrastructure such as dedicated freight corridors, logistics parks, free trade warehousing zones, and container freight stations are expected to improve efficiency and transform the logistics sector in India. The north east region offers significant opportunities in the logistics sector both from the point of view of attracting private and foreign players as also for expansion of Indian start-ups and logistics service providers. With increasing focus of the current government on improving infrastructure across India and efficient policy making the logistics sector is going to be one of the key sectors to watch out for.

IT/ITES in Northeast

A large chunk of highly educated, computer literate, English speaking youths from the Northeast are now working in ITES-BPOs across the country. The fact that the Northeastern states have a legacy of missionary schools, where good English is taught is coming in handy for the industry and offers a huge potential for BPO firms.

Growth drivers for the industry

- **Availability of skilled resources:** The northeastern region has, as of 2016, 1 IIM, 1 IIT and 8 NITs to fulfill the technological resource required for the IT/ITES industry. Along with a legacy of missionary education and exposure to English language from a very early age, the population of the region has a distinct advantage for the IT/ITES industry. Companies such as NIIT Planetworkz, has set up close to 30 Time Machines, an online recruitment kiosk, at different places in Northeastern states.

- **Thrust on IT Connectivity:** There is a focused plan and sustained investment from Government of India may result in better tele-services required for setting up of industries and Smart Cities, with Guwahati being selected for the first batch of Smart Cities to come up in India.
- **Focus on IT infrastructure:** With the exception of Arunachal Pradesh and Nagaland, all other states have dedicated Software Technology Parks set up. The IT Park in Manipur and Tripura have been allotted a massive 20,000 sq. ft. and 35,000 sq. ft. respectively.
- **Lower manpower & Real estate costs:** The Northeast region, being one of the most underdeveloped part of India, has relatively lower manpower and real estate cost of approximately 50% and 40% respectively when compared to Tier 1 cities.
- **Favorable Policies:** The government has undertaken several policy initiatives to incentivize and uplift the state of IT/ITES industry in the Northeast. The Northeast BPO Promotion scheme, which was envisaged under the Digital India Program offers capital incentives, and other incentives for training, diversity and employment along with incentives for setting up of BPO/ITES operations.

Government initiatives

There are several Government schemes running to support the development of IT/ITES industry in NER.

- **The North East BPO Promotion Scheme (NEBPS)** seeks to incentivize establishment of 5,000 seats in respect of BPO/ITES operations in Northeast region at an outlay of INR 500 million creating employment opportunities for about 15,000 persons in BPO/ITES operations. NEBPS provides the financial supports with overall ceiling of INR 100,000/seat in the form of Viability Gap Funding (VGF) to eligible companies, to encourage the growth of the IT/ITES Industry in the North Eastern Region (NER) through BPO/ITES operations³³⁶:

- Capital Support:** Up to 50% of one time expenditure incurred on admissible items subject to an upper ceiling of INR 100,000/Seat.
- Special Incentives:** The following special incentives will be provided within the ceiling of total financial support, i.e., INR 100,000/Seat.
- Training Incentive:** Upto 50% of training expenditure with cap of INR 6,000/employee for total regular employees up to the 1.5 times (employment target) the number of approved seats of BPO/ITES operation.
- Incentive for diversity & inclusion:** Special incentive (% of eligible capital support) for Units providing employment to women and persons with disability will be provided as
 - 5% for 50% women employment
 - 7.5% for 75% women employment
 - 2% for employment for persons with disability
- Incentive for providing employment beyond target:** Special incentive (% of eligible capital support) for units providing employment beyond employment target (1.5 times the number of seats) will be provided as follows:
 - 5% for 2X number of seats
 - 7.5% for 2.5X number of seats
 - 10% for 3X number of seats
- Incentive for promoting local entrepreneur:** Special Incentive (5% of eligible capital support) for units setting up BPO/ITES operations as a consortium with local.

- In addition, **North Eastern Development Finance Corporation Limited (NEDFi)** in association with **Ministry of Development of North Eastern Region (M-DoNER)** has launched the first dedicated venture capital fund for the Northeast region namely “North East Venture Fund”. With a corpus of INR 1 billion with the primary objective of North East Venture Fund (NEVF) to invest in enterprises focused IT & ITES located in the Northeast region.³³⁷

Future prospects for the industry

Provision of IT/ITES services to

International Markets: Northeast India is strategically located for foreign and domestic investors to tap the vast contiguous markets of Bangladesh, Myanmar, China, Malaysia, Thailand, Singapore, Philippines, Indonesia and other East and South East Asian countries. India being the eighth largest trading partner of ASEAN countries (as of June 2016) and close proximity to SAARC countries, the Northeast region of India is positioned to cater to the huge demand in the international market.³³⁸

Conclusion and recommendations

- Improvement in connectivity to be a focus area and participation of more private players to be encouraged through the North East BPO Promotion Scheme (NEBPS).
- The North East Development Finance Corporation Limited supports entrepreneurs and startups to set up IT/ITES operations through its North East Venture Fund with investment limit up to INR 100 million for each project.³³⁹
- Software Technology Parks of India (STPI) set up in the five Northeast regions may expand to all eight states.
- Availability of skilled manpower, low cost of infrastructure and huge potential for providing IT/ITES services to both developed and emerging economies makes Northeast the hot bed for potential investment in the sector.

3. Research & Development

Industry profile



India is the sixth largest in R&D spending across globe totaling over \$66 billion in 2015 for both in-house and contract R&D and accounted for 2.7% of global expenditure. In 2016, government spending on R&D was 0.85% of the GDP and is expected to reach 2.4% of the GDP by 2034. The government has declared 2010-2020 as 'decade of innovation' giving a push to R&D. Around 30% of the top 1,000 global R&D spending organisations are present in India.³⁴⁰

India has the third largest scientific and technical talent pool in the world. There are 162 universities awarding around 4,000 doctorates and around 35,000 postgraduate degrees every year. The Council of Scientific and Industrial Research runs 38 research laboratories.³⁴¹

However, as per US Chamber of Commerce report published in February 2017, India stood at the 43rd position out of 45 nations in Global Innovation Index,³⁴² with Indian professionals largely providing engineering services in India for the global companies which have set up their R&D centres in India. India is re-establishing itself as the most preferred location for Engineering Services and Clinical trials globally.

Engineering Services sector

The US, Japan, Germany, France, the UK, Italy, Netherlands, and Sweden are the world's largest spenders of Engineering Services.

The outsourced engineering services market in India would reach \$15 billion by 2020 from \$7.8 billion in 2015 at a CAGR of 14%.³⁴³

As products become smarter and global companies seek to provide services through internet, they use India's traditional technology and the emerging engineering skills. In this context focus on IP, end-to-end solutions, higher sales, and marketing investments seems to fit into what India has to offer.³⁴⁴

Engineering Services sector growth drivers

Atal Innovation Mission has been created to facilitate the academicians, entrepreneurs and researchers for working on innovative ideas.³⁴⁵

According to Union Budget 2017-18, the government of India is planning to establish 100 India International Skills centres across the country. Also, the government has

allocated funds for various R&D projects such as \$72 million for National Automotive Testing and R&D Infrastructure Project (NATRIP) program. The IITs across India plan to nurture start-ups and house the R&D centres for established firms in order to forge closer industry-academic collaboration.³⁴⁶

Engineering Services sector opportunities

Given the natural advantage of India, the engineering services market is expected to reach \$42 billion at a CAGR of 14% by 2020. However, CRO market includes trial by global companies as well.³⁴⁷

Contract Research Organization (CRO) market

The Indian pharmaceutical industry spends about 6-8% of their sales on R&D, compared to 15-20% by companies in the developed world.³⁴⁸

The Indian clinical trials industry stagnated post 2012 after government tightened the regulations and due to attention from media and activists. There was a sharp drop in the number of trials approved (from 262 in 2012 to just 107 in 2013). The industry is re-orienting towards growth

after new regulatory framework has been implemented which has made the approval process quicker and in line with the global practices.³⁴⁹

Joint ventures, alliances and licensing agreements have increased R&D investment in recent years. However, the definition of “innovation” under Patents Act and the issuance of India's first compulsory licence in 2012 have slowed down the efforts of R&D companies in India.³⁵⁰

CRO market growth drivers

With large number of volunteers for clinical trial, qualified medical professionals, clinicians and data specialists, and good regulatory policies, Indian clinical research market is poised for growth.

The global companies are looking to achieve greater efficiency on R&D expenditure resulting in growing demand for outsourcing of analytical testing and clinical trial services and regulations requiring companies to conduct clinical trial before it is approved.

CRO market opportunities

Clinical trial and research is now a major business in India with over 100 companies currently conducting the clinical trials. India has been increasingly attracting collaborative contract proposals for conducting clinical trials and many entrepreneurs have already come forward to set up their Clinical Research Organisations (CROs).³⁵¹

Prevalence of chronic diseases, relatively low cost of talent and a large pool of volunteers for clinical research makes India a preferred destination for clinical trials.

Clinical trial growth and maturity in India is important as with a large and ageing population, India will need to invest in novel and targeted therapies to treat its own growing population of the diseased.

CRO sector potential for global expansion

The global pharmaceutical companies and Indian entrepreneurs have set up CROs in India as the cost of conducting a clinical trial is more than 50% cheaper than in the United States or the Europe. The reasons for low cost of drug development is the relatively low cost human resource availability for conducting clinical research.³⁵²

CRO sector regulations

01. New regulatory changes have made the approval process quicker.
02. The CDSCO has relaxed the restriction of not allowing trial investigators to conduct more than 3 clinical trials at any given period in time in the country.³⁵³

Government initiatives

- As part of DIGITAL India initiative, online licensing portal SUGAM has been set up by the Central Drugs Standard Control Organization (CDSCO) in March 2016 for the online application of clinical trial requests by pharma companies.³⁵⁴
- The government is planning a major multi-billion dollar initiative with 50% public funding through public private partnership (PPP) model to harness India's innovation capability. The vision is to push India into one of the top-five Pharma innovation hubs by 2020 with one out of every 5 to 10 drugs discovered in India at global scale.³⁵⁵
- The Department of Pharmaceuticals has prepared a “Pharma Vision 2020” document, with a focus to establish India as a leading country for end-to-end drug manufacturing and innovation.³⁵⁶
- \$149.11 million venture capital fund has been planned by the Department of Pharmaceuticals to support R&D start-ups in the pharmaceutical and biotech industry.³⁵⁷

Conclusion and recommendations

As per the 2015 estimates, the private sector investments in R&D in India was about half of the public sector which is generally around 2:1 in case of developed economies. It indicates that there is an enormous potential for private players participation and government could incentivise collaboration of public and private R&D.

The ‘Make in India’ initiative which encourages global companies to manufacture in India will lead to increased R&D investments provided issues such as ease of doing business and complex regulations are addressed.



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