2047

SPECIAL FOUNDATION COURSE · ALL INDIA SERVICES & CENTRAL CIVIL SERVICES

India’s Tech Sector

From Building a Global Industry to Powering Viksit Bharat@2047

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From IT to Tech

THEN · INFORMATION TECHNOLOGY

Key in, process, print

Computers that store and process information, mostly after the event

- Typed in on data-entry machines
- Batch-processed; printed reports days later

NOW · TECHNOLOGY

Sense, decide, act

Connected systems that sense, compute and act in real time

- Captured at source by phone or sensor
- Processed instantly; decisions in real time

HOW COMPUTING EVOLVED

1960s–70s	1980s	1990s	2000s	2010s	2020s
Punch cards, mainframes	Terminals, PCs	Internet	Mobile, cloud	Digital platforms	**AI, real time**

ONE COMPANY'S ARC

1991	1997	2023	2025
Cyient founded	Listed on NSE & BSE	Manufacturing: DLM IPO	Silicon: chip design

THE JOURNEY IN ONE SLIDE

Four phases of India’s tech sector

PHASE 1 · 1985–1996

Foundations

Satellite links through software technology parks; the 1991 reforms open India to the world

PHASE 2 · 1997–2007

Global scale

Y2K and offshoring create India’s global delivery model

PHASE 3 · 2008–2015

Digital rails

Engineering R&D and startups grow; Aadhaar, Jan Dhan and mobile phones connect every citizen

PHASE 4 · 2016 →

Scale and deep tech

UPI, cheap data and 5G; Global Capability Centres, AI and semiconductors

At every stage, government’s best role was to enable: connectivity, policy, institutions and public digital infrastructure.

The state built the rails; everyone built on them

2010	**Identity · Aadhaar**	144 crore enrolments
2013	**Delivery · DBT**	₹51 lakh crore+ sent directly
2014	**Banking · Jan Dhan**	57.8 crore accounts
2015	**Documents · DigiLocker**	70.7 crore users
2016	**Payments · UPI**	2 crore to 24,162 crore transactions a year
Today	**Connectivity · 4G/5G**	109 crore people online

BUILT ON TOP

- Banks and fintechs
- E-commerce and startups
- Government services

NEXT

AI services for every citizen

Source: Government of India data, March–June 2026, via IANS

WHAT MADE IT WORK

Three pillars of a lasting ecosystem

ENTERPRISE

Cyient

$821M

FY26 revenue · 17,000+ engineers · 30+ countries

A 1991 startup, now one of the few Indian groups in design, silicon and manufacturing

TALENT

IIT Hyderabad

#7

NIRF Engineering · #6 in Innovation

17,450+ students since 2008; 300+ startups with ₹1,500 Cr+ revenue

ECOSYSTEM

T-Hub

3,300+

Active startups · 600+ corporates · $2.5B+ raised

Part of a state-built ecosystem with T-Works, WE Hub, TSIC, TASK and RICH

None of these was built by industry alone. Each needed an enabling government.

Data: Cyient FY26; IIT Hyderabad as of Aug 2026; T-Hub

India’s tech industry today

TOTAL REVENUE

$315B

Up 6.1% over FY2025

Exports	**$246B**
Domestic	**$69B**
Employees	**~6 mn, +2.3%**

REVENUE BY SEGMENT

IT services	**$149B**
Engineering R&D	**$63B**
Business process management	**$59B**
Software products	**$23B**
Hardware	**$21B**

Engineering R&D exports grew fastest, at 7.7%

AI MOMENTUM

$10–12B+

AI revenue

20 lakh+

trained in AI, 2–3 lakh in advanced skills

86% of global buyers expect steady or higher demand; **90%** will spend more on AI

Where it is heading: **Human + AI** delivery, GCCs and ER&D owning IP and products, and a shift from AI applications to AI foundations.

Source: NASSCOM, FY2026 estimates published February 2026

PART 2 · POWERING VIKSIT BHARAT

2047: India at 100. You will be at the helm.

Technology will change faster in these 21 years than at any time in our history.

2026

Foundation course

2030s

Leading districts and state departments

2040s

Shaping national policy and ministries

2047

Viksit Bharat: a developed India

A turbulent world and a young India

A turbulent world

- Conflicts, including in West Asia
- Tariffs and fragmented trade
- Supply chains being rewired
- Slower growth, high debt in many economies
- Curbs on talent mobility

A young India

~29 median age of Indians; China ~40, Japan ~49

2 in 3 Indians of working age

~2055 when the window starts to close

India’s young population is its biggest advantage, if it is skilled and employed.

Sources: UN World Population Prospects 2024; UNFPA

THE DESTINATION

Viksit Bharat: many engines, one multiplier

2047	$30 tn	~$18,000	For all
100 years of independence	economy	income per person, high-income status	good jobs, health, education, quality of life

THE ENGINES OF GROWTH

Infrastructure
Roads, rail, ports and power

Manufacturing and auto
Make in India, EVs, PLI

Pharma and health
Medicines for India and the world

Agriculture and food
Farm incomes and food processing

Services
Finance, logistics, tourism

Technology
An engine, and the multiplier for all

Every engine matters. Tech is the one that makes all the others run faster.

Targets: NITI Aayog, Vision for Viksit Bharat@2047

Tech's two roles: engine and multiplier

AS AN ENGINE: A GROWING INDUSTRY

Segment	Where it is heading
IT services & BPM	AI-led, outcome-based services
Engineering R&D	From services to owning IP and whole products
GCCs	$98B today → $105B+ by 2030; spreading to tier-2 cities
AI & software products	From AI applications to Indian AI models and platforms
Electronics manufacturing	₹11.3 lakh crore today → $500B output by 2030–31
Semiconductors	12 projects, ₹1.64 lakh crore → ~$110B market by 2030

AS A MULTIPLIER

Farms: advice, markets, credit

Factories: design, automation, quality

Health: screening, telemedicine

Classrooms: learning in every language

Government: services on digital rails

Tech is an industry in its own right, and the multiplier for every other engine of Viksit Bharat.

Sources: NASSCOM FY26E; Zinnov (Aug 2026); MeitY; ISM. Today's revenue by segment: slide 6.

TECHNOLOGY AT GALLOPING SPEED

Four forces, accelerating together

Computing

More power, lower cost; GPUs drive AI

Connectivity

4G to 5G to 6G, to every village

Sensors

Low-cost sensors in soil, roads, machines

AI algorithms

Models that see, speak, write and reason

BEYOND AI: OTHER DISRUPTIVE TECHNOLOGIES

Quantum | **Robotics, drones** | **3D printing** | **AR / VR** | **Biotech** | **Space tech** | **EVs, batteries**

Backed by national missions: Quantum Mission, drone PLI, BioE3, space reforms, battery PLI

AI is "more profound than electricity or fire." Sundar Pichai, CEO, Google, 2018

HOW AI IS BUILT

The five layers of the AI stack

5 · Applications	AI in health, farming, education, services	**Among the world's largest user bases: strong**
4 · Models	Algorithms trained on data	BharatGen and Bhashini: Indian-language models
3 · Compute	GPUs and semiconductor chips	38,000 GPUs, 20,000+ more coming
2 · Infrastructure	Data centres and networks	Under 1 GW today, about 10x by 2030
1 · Energy	Power for the whole stack	500+ GW installed, over half non-fossil

India is extremely strong in **using** technology, not yet in **developing** it. Viksit Bharat needs us to build every layer.

Framework and figures: Ashwini Vaishnaw, Union Minister for Electronics & IT, India AI Impact Summit, Feb 2026

THE MULTIPLIER AT WORK

AI across every engine of growth

Agriculture and food
Crop advice, pest alerts and fish-farm water sensors, in local languages

Manufacturing and auto
Predictive maintenance, quality checks, faster EV and product design

Pharma and health
Faster drug discovery; early screening and remote diagnosis

Infrastructure
Monitoring roads, bridges and grids; smarter traffic and power

Services
Credit for small businesses, fraud detection, logistics routing

Education
Personalised learning in every Indian language

Energy
Grid forecasting and the move to clean power

Governance
Faster services, grievance redress, better targeting of schemes

Every district has most of these. Every officer will touch them.

THE PRIZE

For every Indian, and for humanity

Better off economically

- A farmer gets crop advice and fair prices
- A small business borrows on its digital record
- Young people find jobs in new industries
- Indian products reach world markets

A more comfortable life

- A village patient sees a specialist remotely
- A child learns in her own language
- Pensions and certificates without queues
- Safer roads, faster emergency response

Solved for 140 crore Indians, solved for the world

What works at India’s scale and cost can serve billions across the Global South; UPI already runs in several countries.

WHAT WILL DECIDE IT

Tailwinds and headwinds

Tailwinds: what is going for us

Technology

The forces and AI we have just seen, running on India's digital rails

Demographic dividend

A young workforce while much of the world ages

Headwinds: what holds us back

Education

A strong policy in NEP 2020; weak execution

R&D

Too little investment, mostly by government

Innovation

Rote learning over critical thinking and risk-taking

Startups

Too little research becomes products

The tailwinds are strong. Reaching 2047 depends on how fast we fix the headwinds.

THE KEY CHALLENGE

Education: NEP 2020 points the way

Strong foundations

5+3+3+4 structure from age 3; literacy and numeracy for every child

Mother tongue

Learning in the home language in the early years

Skills early

Vocational exposure from Grade 6, with internships

Multidisciplinary

Science, arts and commerce without rigid walls

Flexibility

Multiple entry and exit; Academic Bank of Credits

Ambition

50% enrolment in higher education by 2035

The policy is right. Where we lag is execution, in every school, college and district.

Source: National Education Policy 2020, Ministry of Education

WHAT WE MISSED

From rote learning to innovation

WHAT OUR SYSTEM REWARDS

- Memorising answers
- Clearing exams
- Avoiding failure
- Following the textbook

WHAT INNOVATION NEEDS

- Critical thinking and curiosity
- Asking the right questions
- Taking risks
- Persistence after failure

0.64% of GDP spent on R&D in India; the US, China and Israel spend over 2%

50%+ of R&D is funded by companies in advanced economies; in India, mostly by government

Disruption creates opportunity



Research must travel from the lab to the market: Technology Readiness Levels (TRL)

1	2	3	4	5	6	7	8	9
Principles	Concept	Proof of concept	Lab tested	Field setting	Demo	Real-world prototype	Complete	In use

TRL 3–4: where most academic research stops today

TRL 7 and beyond: where products and startups are born

Research in IITs, IISc, CSIR and DRDO labs must become products. The ₹1 lakh crore RDI scheme now funds this journey.

The momentum is with India

GROWTH

7.7%

Real GDP growth in 2025–26

The fastest-growing major economy

7.8% in the last quarter, January–March 2026

CONSISTENT POLICY DIRECTION

2014	Make in India	**2020**	PLI schemes for manufacturing
2015	Digital India	**2021**	India Semiconductor Mission
2016	Startup India	**2023**	National Quantum Mission
2017	GST: one national market	**2024**	IndiaAI Mission

Plus digital public infrastructure at population scale, and a trusted place in global supply chains

Growth, a young workforce, digital rails and policy continuity: India has rarely been better placed. What remains is execution.

Source: National Statistics Office, provisional estimates, June 2026

YOUR ROLE

From promise to progress

AI can transform every sector. Deployment is your everyday job, and each headwind has a lever:

LEVER	WHAT YOU CAN DO	ALREADY WORKING
Deployment	Put AI into health, farms and schools, on our digital rails	Aadhaar, UPI, DigiLocker; now DIGIPIN
Education	Make NEP 2020 real in every school and college in your charge	Foundational literacy missions
R&D	Bring local problems to universities and labs; use what they build	I-STEM opens research instruments to all
Innovation	Open your data and problems; accept honest failure	Atal Tinkering Labs in schools
Startups	Be the first customer; run challenges and paid pilots	iDEX: 70+ challenges, ₹251 Cr+ in orders

TAKE THESE WITH YOU

Five rules for the officer of 2047

1	**Enable, don’t control**	The tech sector grew fastest where the state cleared the path
2	**Move at the speed of citizens**	Pilot in weeks, scale in months, not years
3	**Treat data as a public asset**	Clean, shared responsibly and protected
4	**Partner widely**	Industry, academia and startups are your force multipliers
5	**Build institutions that outlast you**	Cyient at 35 years, IIT Hyderabad at 18, T-Hub at 11, and all still growing

In 2047, you will be at the helm.

Make technology serve every citizen.

Thank you. Questions welcome.

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