

Assessment of Global and India IT Services, Integrated Digital Solutions Market, and Data Centre, Cloud Services Industry, Optical Fibre Design and Deployment Industry in India

April 2025



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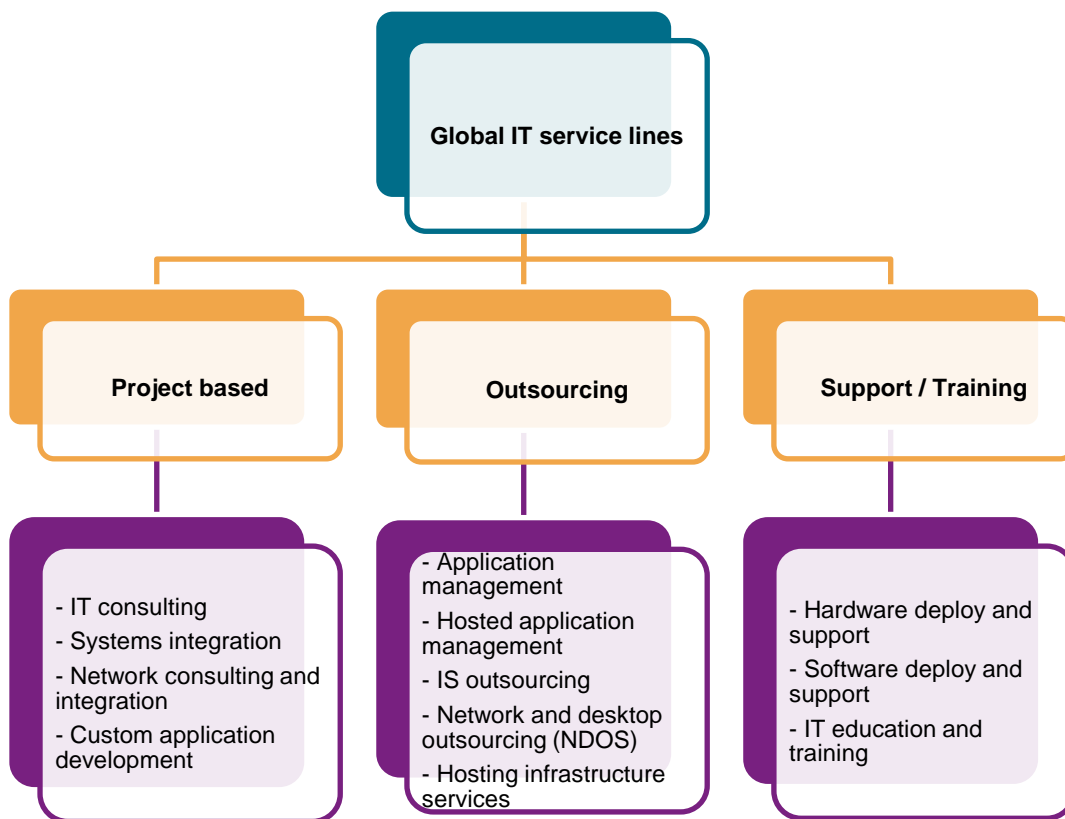
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1. Assessment of IT services and IT-enabled services market

Overview of the structure of Global IT Services industry

The global IT services industry is dynamic and multifaceted, encompassing a wide range of services that support organisations in managing and leveraging technology for their business objectives. The industry can be defined based on the service lines. The industry provides a diverse array of solutions that cater to the multifaceted requirements of businesses worldwide. Categorised into three key pillars, these services encompass project-based initiatives, outsourcing solutions, and support/training services.



In the realm of project-based services, IT consulting takes the centre stage, offering strategic insights and recommendations for technology adoption and optimisation. Systems integration and network consulting and integration services ensure the seamless interoperability of IT systems, fostering connectivity across the organisational landscape. Custom application development is a pivotal component, tailoring software solutions to meet specific business requirements and promoting innovation.

Outsourcing services constitute a substantial part of the IT service lines, providing organisations with opportunities to streamline operations and enhance efficiency. Application management services deliver ongoing support and maintenance for software applications, ensuring their optimal performance throughout their lifecycle. Hosted application management

and network/desktop outsourcing (NDOS) extend these capabilities, enabling businesses to delegate specific IT functions and infrastructure services for improved operational agility.

The third category, support and training services, is integral for empowering organizations with the necessary resources and knowledge to maximise their IT investments. Hardware deployment and support services guarantee the smooth integration and functionality of IT hardware, complemented by software deployment and support services that efficiently implement and maintain software solutions. IT education and training services play a pivotal role in upskilling personnel, ensuring that they possess the expertise to navigate the dynamic IT landscape effectively.

Key business drivers of the IT services business

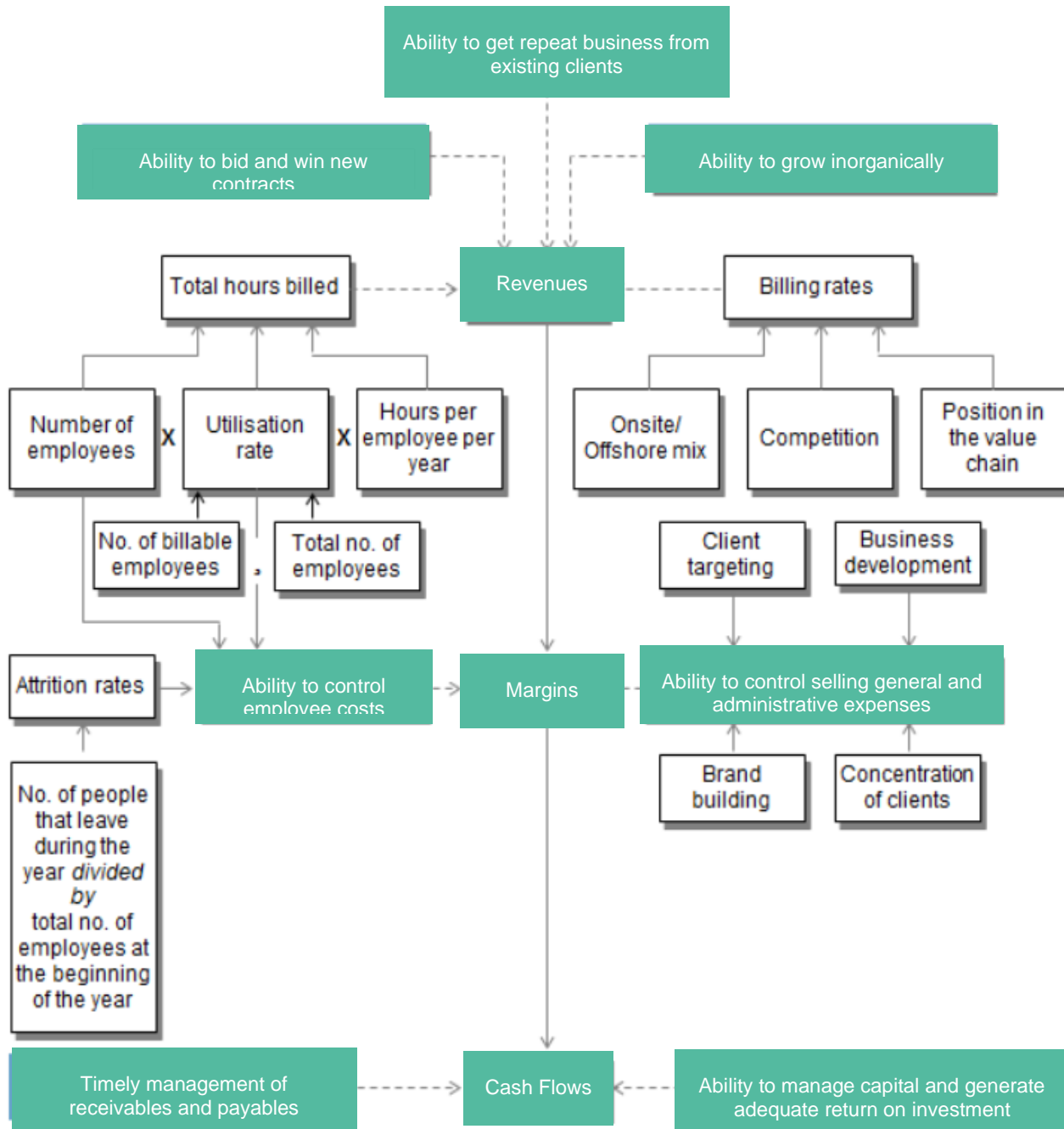
In the dynamic landscape of IT services, achieving sustained success hinges upon several crucial business drivers that propel companies forward. The ability to secure repeat business from existing clients stands out as a foundational pillar. Building and maintaining strong relationships with clients not only fosters trust and loyalty but also positions IT services providers for long-term partnerships and continued collaboration.

Equally essential is the capability to bid for and win new contracts. In a competitive marketplace, organisations need to showcase their expertise, innovation, and reliability to attract new clients. A successful track record, coupled with a forward-looking approach enhances the chances of securing fresh contracts, expanding the client portfolio, and diversifying the business.

Embracing inorganic growth is another pivotal driver for IT services providers. This involves strategic mergers, acquisitions, or partnerships that can rapidly expand the company's capabilities, reach, and service offerings. Inorganic growth acts as a catalyst, enabling organisations to tap into new markets, access complementary technologies, and strengthen their overall market positioning.

The synergy of these key business drivers forms a robust strategy for navigating the competitive landscape of IT services. By fostering client relationships, consistently winning new contracts, and strategically pursuing inorganic growth opportunities, IT service providers position themselves not only for immediate success but also for sustained growth and relevance in an ever-evolving industry.

Business model of IT services and IT enabled services



Source: Crisil Intelligence

Digital transformation and product engineering among the key trends of IT industry

The global IT services industry has undergone a significant transformation, with a strong focus on digital transformation and product engineering. These trends have reshaped the industry structure, influencing service offerings, client engagements, and the overall competitive landscape.

Digital transformation:

Digital transformation has emerged as a driving force within the IT services industry. Organisations across sectors are leveraging technology to enhance their operations, customer experiences, and business models. IT service providers play a pivotal role in guiding companies through this transformative journey. Services encompass digital strategy consulting, data analytics, cloud adoption, and the implementation of emerging technologies, such as AI, ML, and IoT.

The industry's structure has adapted to accommodate the growing demand for digital transformation services. Traditional IT services providers have diversified their offerings, incorporating specialized digital capabilities. This includes expertise in user experience design, agile methodologies, and the integration of advanced technologies to help clients navigate the complexities of digital evolution.

Product engineering

Product engineering, another key facet of the industry's evolution, emphasises the development and innovation of software and hardware products. IT service providers are increasingly involved in the entire product lifecycle, from conceptualisation to design, development, testing, and maintenance. This shift reflects the industry's move beyond conventional IT services to a more comprehensive approach encompassing product ideation and creation.

Product engineering within the IT services industry often involves collaboration with clients to bring their ideas to fruition. This collaborative model has given rise to a more strategic partnership between service providers and businesses, with a shared focus on innovation and product excellence. Service providers are investing in research and development capabilities to stay at the forefront of technological advancements, driving product innovation for their clients.

Impact on IT services industry from Cloud adoption

Cloud adoption has had a profound impact on the IT services industry, influencing various aspects of service delivery, business models, and client relationships. Here are some key impacts:

Parameter	Description
Shift in service offerings	Cloud adoption has prompted a shift from traditional on-premises IT services to cloud-based solutions. Service providers now offer a range of cloud-related services, including cloud consulting, migration, management, and optimisation

Parameter	Description
Transformation to "as-a-Service" models	The emergence of cloud computing has led to the rise of "as-a-Service" models such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). IT service providers are adapting their offerings to align with these cloud-based consumption models.
Digital transformation enabler	Cloud adoption is a key enabler of digital transformation. IT service providers play a crucial role in helping organizations leverage cloud technologies to innovate, automate processes, and enhance their overall digital capabilities.
Agility and scalability	Cloud computing allows organizations to scale their IT resources based on demand, providing greater agility and flexibility. IT service providers help clients harness the scalability of the cloud, enabling them to adapt to changing business needs more effectively.
Managed cloud services	The demand for managed cloud services has risen as organizations seek expertise in operating and optimizing their cloud environments. IT service providers offer services for managing infrastructure, security, compliance, and performance in the cloud.
Cost optimisation and efficiency	Cloud adoption offers potential cost savings through pay-as-you-go models and reduced upfront capital expenditures. IT service providers assist clients in optimizing costs, ensuring efficient resource utilization, and providing insights into cloud cost management.
Security and compliance challenges	The shift to the cloud introduces new security challenges and compliance considerations. IT service providers specialize in implementing robust security measures, ensuring data protection, and assisting organizations in navigating compliance requirements in the cloud.
Skills evolution	Cloud adoption has led to a shift in the skills required within the IT services industry. There is an increased demand for professionals with expertise in cloud architecture, cloud security, and cloud management. Service providers are investing in upskilling their workforce to meet these demands.
Global reach and collaboration	Cloud services enable organizations to operate globally without the need for extensive physical infrastructure. IT service providers leverage cloud capabilities to facilitate collaboration, communication, and the seamless integration of operations across geographies.

Parameter	Description
Evolving client relationships	Cloud adoption has changed the dynamics of client relationships. IT service providers are becoming strategic partners in helping clients navigate digital transformations and achieve business goals through the effective use of cloud technologies.
Increased competition and innovation	The growing demand for cloud services has led to increased competition among IT service providers. This competitive landscape has driven innovation, with companies continuously enhancing their offerings to stay ahead in the rapidly evolving cloud market.

Source: *Crisil Intelligence*

Overall, cloud adoption has not only impacted the services offered by IT service providers, but has also transformed how organisations approach technology, innovation, and business operations. The industry continues to evolve, as new cloud technologies and services emerge.

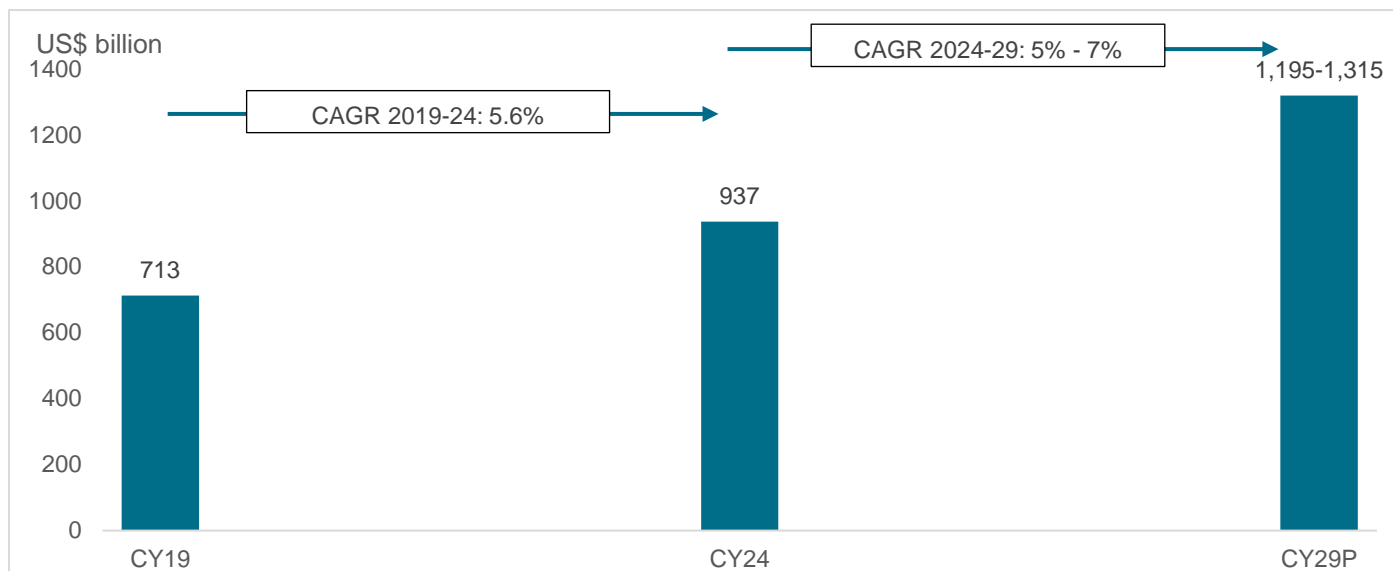
Global IT services market

The constantly evolving global IT sector plays a crucial role in our interconnected world, encompassing a diverse array of technologies and services, such as software development, hardware manufacturing, cybersecurity, and cloud computing.

Between CY2019 to CY2024, the IT industry has seen a growth of 5.6% CAGR. In recent years, the IT industry has been characterized by rapid innovation and digital transformation due to emerging technologies like artificial intelligence, blockchain, and the Internet of Things. Moreover, the COVID-19 pandemic accelerated the adoption of remote work and digital solutions, further highlighting the industry's significance.

Moving forward, as global business organizations continue to rely on IT to drive efficiency, connectivity, and innovation, the global IT industry is poised to grow at a considerable pace. The industry is expected to grow at CAGR of 5%-7% from CY2024 to CY2029 reaching \$ 1,195 – 1,315 billion by CY2029.

Global IT services industry



Note: The above values include revenues from project-oriented services, ITO services, IT support and training services, and enterprise cloud computing services segments

P :Projected

Source: Grand View Research, Crisil Intelligence

Recent trends and growth drivers in global IT industry

Parameter	Description
Growing use of edge computing and quantum computing	Demand of edge and quantum computing is continuously growing due to their benefits like improved response times, enhanced bandwidth availability, faster insights, better data security are helping companies strengthen their operations.
Increasing focus on digital services across sectors	Digital services are gaining traction across all the major sectors due to which IT companies are increasingly shifting their focus on their digital solutions offering portfolio. Additionally, increasing adoption of digital-first strategy by brands is further expected to boast this trend.
Increasing adoption of IT in emerging economies	As the emerging economies continue to develop economically and technologically, they are recognizing the pivotal role that IT services play in enhancing productivity, fostering innovation, and driving economic growth. With the growing availability of affordable hardware and internet connectivity, businesses and governments in emerging economies are leveraging IT services to streamline operations, improve public services, and bolster their global competitiveness.
Increasing focus on sustainability	Companies are increasingly incorporating sustainability into their IT strategies. Green IT services, energy-efficient data centres, and environmentally friendly practices are gaining prominence to reduce the environmental impact of IT operations

Source: Crisil Intelligence

Indian IT services industry

Evolution of Indian IT services market

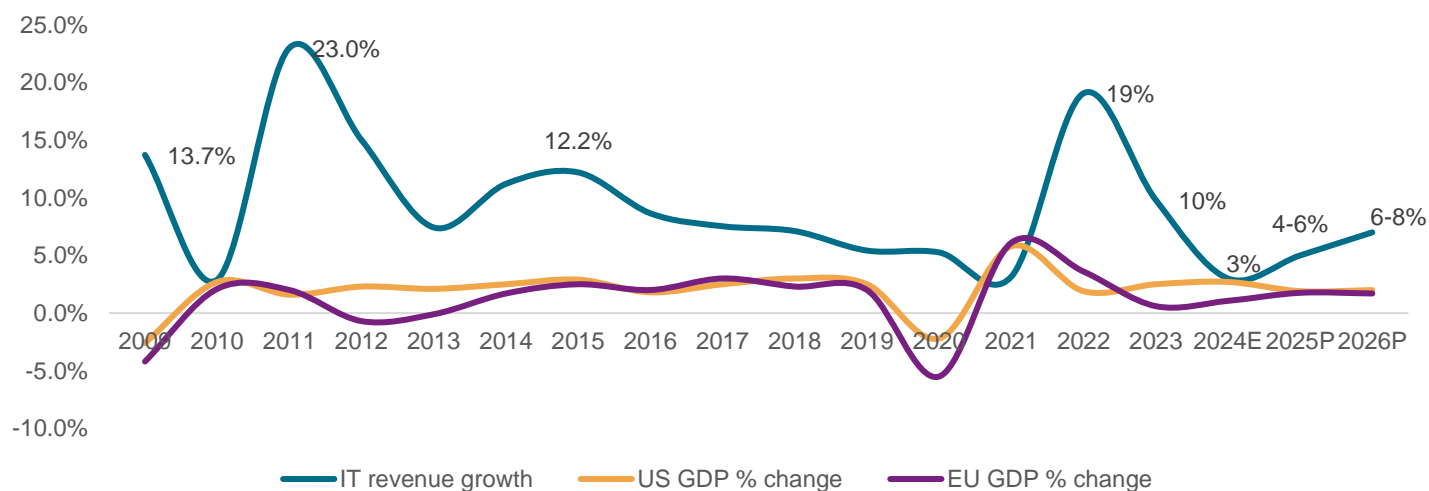
IT Services Industry Pre 2010	IT Services Industry from 2011 to 2020	IT Services Industry from 2021 to present
<p>Products: Customized software development, re-engineering, implementation, and maintenance</p> <p>Key industry needs: To reduce cost, build a robust, scalable, secure solution, to keep up with regulatory compliance requirements, decrease time to market, increase collaboration</p> <p>Key Industry characteristics during the period:</p> <ul style="list-style-type: none"> • Major sales ~90% came from repeat transactions. • Companies started focusing on de-risking product lines • Inorganic growth through global acquisitions • Building and investing software development centres globally • Investment into research and innovation • IT services market affected less in comparison with hardware and software market post global slowdown • IT players implementing global delivery model 	<p>Products: Custom application development, application management, system integration services</p> <p>Key industry needs: Automate, mobile solutions, pay as you use solutions, Cloud solutions, social media, Enterprise mobility, Business Intelligence, Analytics, Internet of Things, change from run the business solutions to change the business solutions, usability on multiple devices</p> <p>Key Industry characteristics during the period:</p> <ul style="list-style-type: none"> • IT players focused on growing through non-linear growth model • Cloud enabled services • Focus on freedom from infrastructure (cloud solutions) • Vendor consolidation • Increased local recruitment to ride protectionism in major markets seen after global financial crisis • Companies providing end to end services portfolio • IT players also formed various strategic alliances 	<p>Products: Custom application development, software testing, IT consulting, System Integration, Infrastructure Management services, support, and training.</p> <p>Key industry needs: Hyper personalized products and services, AI, mixed reality, digital engineering, blockchain, multi-cloud, edge computing, cybersecurity, 5G/6G, RPA</p> <p>Key Industry characteristics during the period:</p> <ul style="list-style-type: none"> • Covid-19 pandemic highlighting need for operational resilience and enterprise adaptability • Industries leveraging technology to differentiate themselves in the market • IT players increasing digital workforce • Increase in productivity on account of Generative AI • Clients demand for real time analysis and insights

Source: Crisil Intelligence

Trend of IT services in India & correlation with US and EU GDP growth

Majority of the revenue for the IT players are derived from key markets in North America and Europe, especially from the consumer and banking sector, understating the dependence of Indian IT players on the key markets. On account of the global slowdown, clients in the key markets have cut back on digital transformation spending. Indian IT players have matured and become resilient over time after witnessing major world-wide crisis in the last two decades. Post the Covid-19 crisis, IT players have resorted to measures such as improving productivity, and providing newer tech services such as Generative AI to increase margin.

Historical trends indicate that a potential stable-growth phase supported by steady economic growth of major economy



Note: US GDP % change calculated on basis of GDP at constant prices; Source: IMF, Crisil Intelligence

Key past trends seen in the IT Service Industry in correlation with EU and US market

IT industry grew from the late 1990s when global companies like IBM, Microsoft came into the country. India provided the global players with abundant talent and cost reductions at the lowest end of the value chain. In a short span of time, Indian IT players started expanding their delivery networks and established various delivery centres in multiple locations to increase near-shore or on-shore services. With respect to products, IT players started to provide integrated service offerings providing full suite of cost-saving options and conforming to the highest quality standards. Players also adopted outcome-based pricing model from the previous cost models like fixed price and T& M (Time and Material). Post the global financial crisis in 2008, companies followed a de-risking strategy, wherein instead of giving large deal orders to IT vendors, they moved to smaller deals, also to get price advantage. Another growth-driver post the 2008 crisis was the increasing regulatory compliance requirements in the US and European markets enabling IT to drive solutions.

In 2010s, Indian IT players started bidding for large scale turnaround projects which was the domain experience of global players. To upgrade their respective tech capabilities, Indian IT players had to undergo changes in business processes. Post 2010, cloud adoption emerged as the possible solution for the IT transformation, to reduce operating costs and improve agility. The aim of IT players was changed from cost reduction to improved productivity with being able to manage new business demands. As the Indian IT industry reconfigured and matured, new trends emerged as part of the process. Companies shifted their focus & moved data in different IT systems available to company executives in real time and in a seamless manner. Indian IT players recognized the need to process real time data and integrate the IT processes with core business activities including company’s clients and suppliers.

Next set of disruptions that hit the Indian IT industry included digital services like automation, Internet of Things, cloud adoption among others. Companies started looking for digital transformation and wanted to become a digital enterprise.

The advisory and design approach was provided by IT players, first deployed in a native cloud environment, and later deployed in the business. Digital and automation moved from point deployments to enterprise-wide adoption. Also, there was a shift in market buying patterns with “as a service” outsourcing growing at a faster rate as compared to traditional sourcing.

While Covid-19 pandemic impacted economic activity across most geographies, IT services industry faced minimal headwinds. Top IT had a diverse portfolio consisting of various sectors which ultimately helped them in the pandemic. Also, banks faced increased regulatory oversight on account of pandemic, and since the sector contributed the highest revenue, IT companies faced lesser than expected brunt on account of pandemic. Post the pandemic, there was strong demand for IT services industry which helped the overall industry. Industries such as Banking, Telecom and Healthcare were particularly favourable for the industry. However, the pandemic taught the IT sector that it needs to invest more in digital skill and to pursue client diversification.

Government’s digital India missions to aid growth over medium term in India’s domestic IT services industry

IT services industry comprises of an array of services encompassing Artificial Intelligence, Machine Learning, Data engineering, enterprise risk management, cybersecurity, software management, consultancy services across industries ranging from BFSI, healthcare to automotive. The industry also provides sector specific such as digital patient management, supply chain optimization.

The domestic revenues of the IT sector have grown significantly, driven by the Digital India and e-governance initiatives. From fiscal 2020 to 2025, the domestic revenues have grown at a Compound Annual Growth Rate (CAGR) of 6.5%, reaching approximately Rs 1,685 billion by fiscal 2025. This growth is attributed to the increased focus on data analytics, Machine Learning, and Artificial Intelligence, enabling the development of products with mass personalization

Furthermore, the Domestic revenue is expected to grow by 6% to 8% from fiscal 2025 to fiscal 2030, led by demand for differentiated digital offerings. Government spending on Digital India initiatives has also supported the domestic growth for IT sector. For upcoming years, demand is estimated to remain intact majorly driven by rapid digitalization across all industries and the government's push for Digital India.

Long-term growth is also expected from technology and platform upgrades and e-governance initiatives of the central and state governments. In fact, the government and its various agencies are expected to remain the largest contributor to domestic IT revenue.

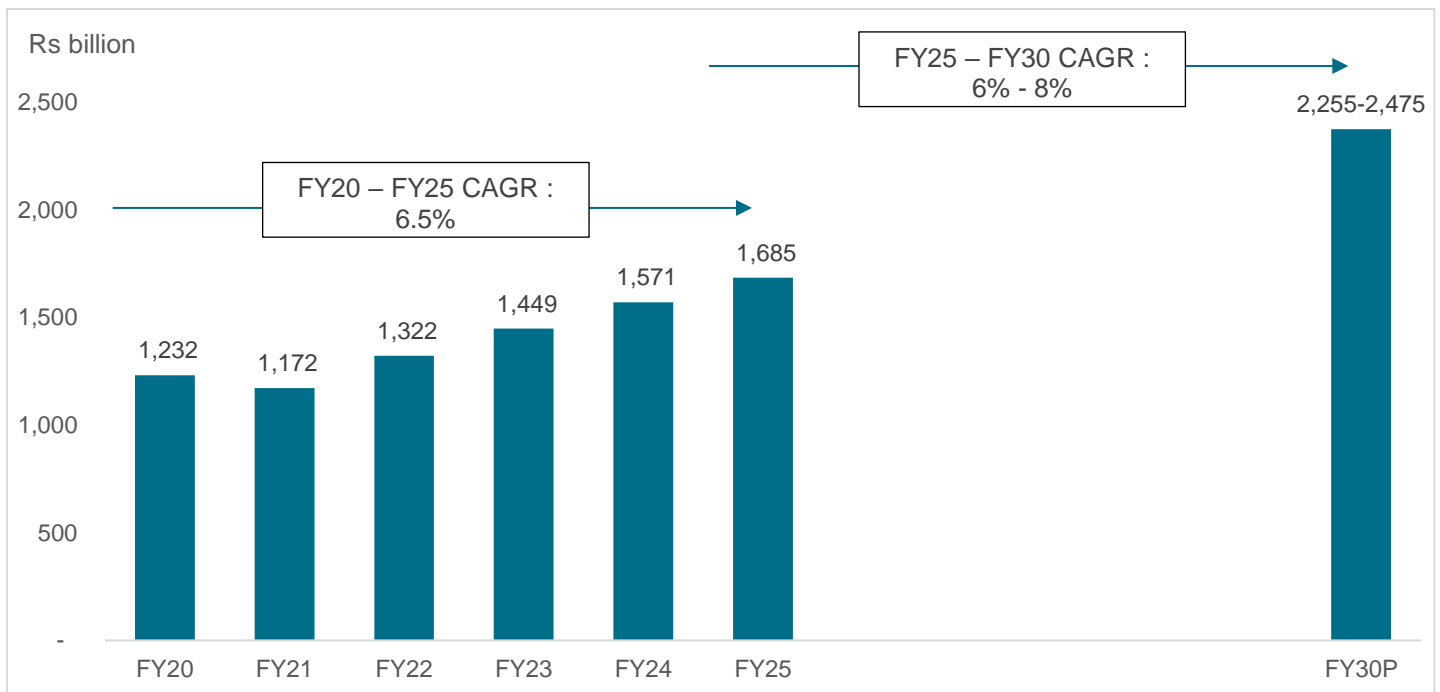
As per National Association of Software and Services Companies (NASSCOM) estimates, government spend on digitization; IT infrastructure improvement; and implementation of technology in healthcare, manufacturing and agriculture under the Digital India initiative is expected to translate into a \$6 billion opportunity for IT players. However, issues such as slow pace of implementation, clearances and stretched receivables in the case of government contracts still exist.

NASSCOM reports that Indian players account for over 65% of the domestic market, with global IT vendors holding the remaining share. Additionally, approximately 40-50% of the domestic IT services market consists of unorganized players.

The domestic market poses high risks and low returns for vendors, who often face significant execution challenges disproportionate to their profitability. Lower billing rates, along with lengthy tendering and bidding processes for government contracts, make this market less appealing for large players. This is evident in the fact that Tata Consultancy Services, Infosys, Wipro, and HCL Technologies collectively accounted for 55-60% of export revenue in fiscal 2024. The ticket size of domestic projects ranges from ₹2-5 million, compared to over ₹65 million for export projects. The smaller size of domestic contracts attracts many bidders, leading to a highly competitive market with reduced margins.

However, between fiscals 2016 and 2021, while domestic IT services revenue clocked ~6.5% CAGR, exports surged ~9% CAGR in rupee terms. In fiscal 2022, the rupee depreciation aided the rupee revenue realization for the exports segment, making the export segment to grow at a higher pace than the domestic market. Sustained stable export growth, along with larger ticket sizes, underlines the industry's preference for overseas markets, which is not set to change in the medium term.

Trend and outlook of domestic IT services industry



Note: E: Estimated, P: Projected;
Source: Company Reports, NASSCOM, Crisil Intelligence

Indian IT services export market

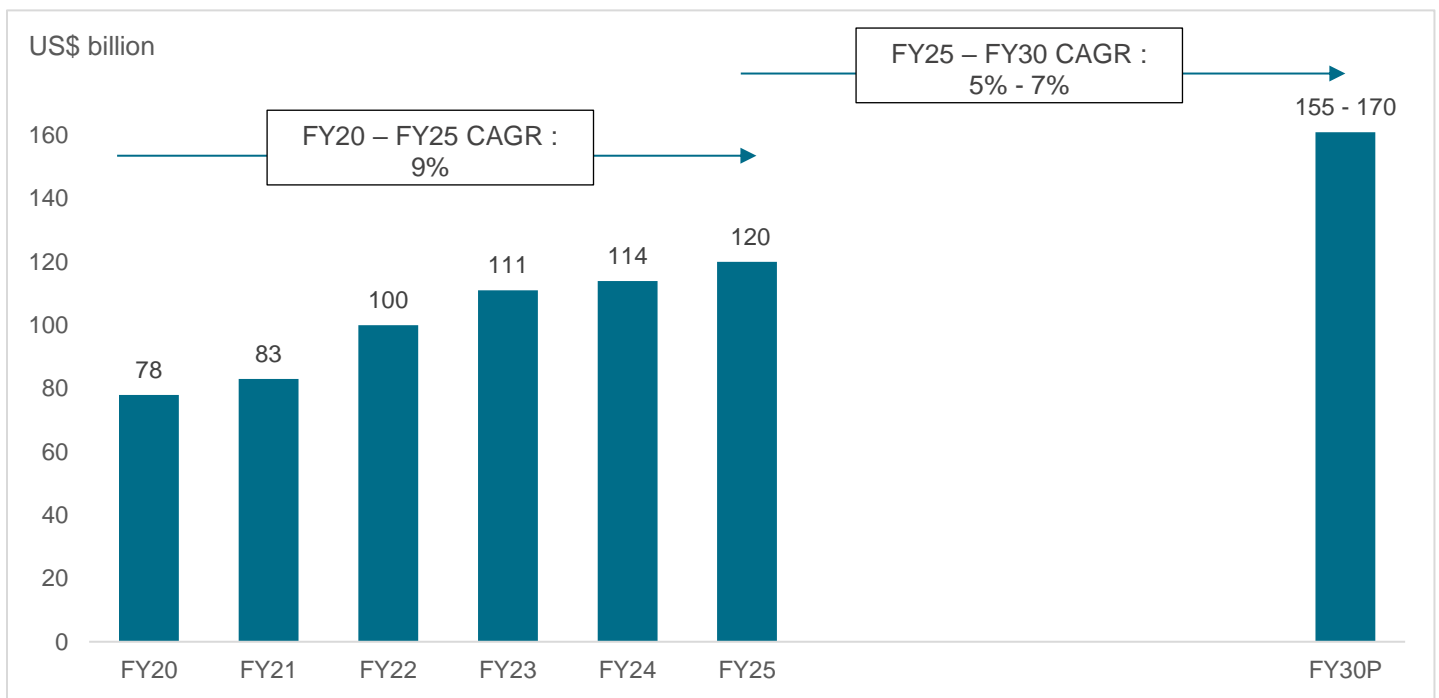
Export growth to remain modest in fiscal 2025 amid high interest rates

Despite a challenging fiscal 2024, marked by high inflation and a macroeconomic slowdown in developed markets that led to reduced tech budgets across sectors, the IT services industry has shown a promising recovery in FY25, achieving a 5% YoY growth. This uptick is expected to continue as the industry benefits from new order inflows and the resumption of previously deferred projects, particularly in regions like North America and the BFSI sector, which had seen significant project postponements earlier.

Along with companies focusing on front-to-back digitization, a new set of services in terms of differentiation is also expected to drive growth. The large-scale shift by customers and consumers to digital channels over the previous fiscal years is expected to make it important for enterprises to differentiate themselves in these channels using technology. This further entails more use of data analytics, AI, and ML for mass personalization.

Over fiscals 2025-2030, Crisil Intelligence expects IT services' export revenue to log a compounded annual growth rate (CAGR) of 5% – 7%, compared with ~9% in the previous five fiscal years from 2020 to 2025. The growth will be led by digital export services in cloud services, RPA, and AI, along with offer differentiation, which is expected to provide an opportunity for Indian IT players to collaborate with product-based companies. Additionally, global in-house centers (GIC) have found increased traction in India, with players setting up digital innovation hubs to experiment with newer technologies.

Trend and outlook of export IT services industry



Note: E: Estimated, P: Projected; Source: Company Reports, NASSCOM, Crisil Intelligence

Service line classification of Indian IT services exports

Based on service line, the IT services exports can be classified into three broad categories namely Project-oriented services, Outsourcing services, and Support and training. These segments can be further bifurcated as follows:

Sector	Performance
Project oriented services	<p>Custom application development includes Customised development of software applications and interfaces, enhancements to existing package applications.</p> <p>Software testing includes black and white box testing of all applications, software, network systems to check all aspects of desired intention.</p> <p>IT consulting includes information systems strategy, IT and network planning, architectural assessments, technical systems and network design, supplier assessment and maintenance planning.</p> <p>System integration includes planning, design, implementation and project management of a solution that addresses a customer's specific technical or business needs.</p>
Outsourcing services	Infrastructure management services includes administering and managing technology, information and data in a proactive way. Its scope ranges from the desktop to networking, storage, data, security and cloud-based services.
Support and training	Under this comprehensive support solutions are provided to global clients in order to ensure smooth operations. These include technical support, software training, and skill development programs.

Vertical wise performance of IT services export industry

Demand for IT services has revived in sectors such as manufacturing and retail. The banking, financial services, and insurance (BFSI) sector is expected to remain the leading spender, followed by telecom. The healthcare sector will largely be driven by transformation spending.

Sector	Performance
Banking and Financial services (BFSI)	Historically, the banking, financial services and insurance (BFSI) segment has been the largest vertical, accounting for ~27-30% of information technology (IT) services exports. The vertical has spent on customer service, mortgage transformation and lending services despite pressure on demand for loan. The focus is on digitization of the core systems, improving customer experience, and using technology is mitigate risks and implement controls. Recently, Tata Consultancy Services (TCS) has entered a deal with a Swedish bank Ikano to provide banking solutions through its SaaS platform TCS BaNCS™.
Insurance	In the insurance segment, players have been increasingly investing in data and analytics to make smarter decisions and gain customer insights into the development of new products and services. Recently TCS has entered a deal with ReAssure a phoenix group holding company to digital transform its insurance business.
Telecom	The telecom industry has seen a significant increase in technology spending in recent years, driven by the global penetration of 4G VoLTE services and the need for network virtualization and customer retention through telecom analytics. As a result, spending as a proportion of revenue has risen for major

Sector	Performance
	players. The upcoming 5G rollout is expected to further boost IT exports, with companies like Infosys already capitalizing on opportunities, such as its recent deal with Liberty Global to build and scale entertainment and connectivity platforms.
Healthcare	Healthcare and pharma industries focus on patient care platforms, customer experience, predictive patient care and dynamic health monitoring. Further, the industry is experiencing traction towards research and development-based analytics services.
Retail	The key retail markets for Indian players continue to be the US, the UK and the EU. As per industry interactions, retail is fast witnessing digital service adoption, with retail majors seeking to go omni-channel to counter the threat from e-commerce companies. Thus, the drive for retail firms to go digital and improve their omni-channel capabilities is expected to provide avenues for Indian IT players in the retail space in the current fiscal. Recently, TCS has entered in a contract with a global fashion retailer, as the strategic partner to accelerate their AI/Data journey. This includes decommissioning of their legacy platforms.
Manufacturing	Manufacturing companies have started adopting digital technologies. BMW utilises data analytics to reduce the chances of an assembly failure. Firms have also been investing in IoT, for instance, Rolls-Royce uses sensors to collect data to monitor performance of engines, and big data, AI and analytics to extract live inputs from data, resulting in operational savings for customers due to real-time preventive maintenance of engines.

Source: Crisil Intelligence

Emerging trends in the Indian IT services Industry

Technological disruptions are changing the IT landscape. Technological spending is critical in today's world as companies transform into a scalable, secure and connected organisation. Some of the emerging trends such as AI, ML, augmented and virtual reality (AR/VR), and Metaverse are detailed below.

Trend	Advantages	Use cases
Metaverse/AR and VR	Increased collaboration, new communication opportunities, reduction of costs in testing model concepts, innovative marketing tool, Lower employee training and onboarding costs	<ul style="list-style-type: none"> Home improvement companies using Metaverse to elevate customer experience in digital shopping - immersive and interactive Gaming companies using AR and VR to give an immersive customer experience Medical companies using AR and VR for medical imaging
IoT	Access to real-time visibility, smart solutions, reduced costs and data-driven operational efficiency	<ul style="list-style-type: none"> Manufacturing companies using IoT driven devices to improve operations Healthcare industry using IoT to monitor health via wearables

Trend	Advantages	Use cases
AI/ML/ Natural Language Processing (NLP)	Reduction of human error, perform repetitive tasks and saving time	<ul style="list-style-type: none"> E-commerce companies using AI to better understand customer preference, personalise the customer journey and help in sales forecasting Banks using conversational AI chatbots to ensure the balance between chatbots and giving customers the human experience. Human workforce management platforms using NLP to scan thousands of applications
Cloud computing	Cost savings, mobility, flexibility, data driven insight and increased collaboration	<ul style="list-style-type: none"> Banks using cloud services for fraud detection Healthcare industry using cloud to let patients access lab results, prescriptions, etc
Blockchain	Reduced costs, traceability, security and speed	<ul style="list-style-type: none"> Companies using blockchain technology to make smart contracts
Automation	Cost savings, fulfill compliance requirement, error reduction, customer satisfaction and increased productivity	<ul style="list-style-type: none"> Automating driving such as robo taxis, etc Reinsurance companies using automation to streamline processes and incorporating it as a part of the business model
Big data analytics	Modernising business models, enhanced decision making, improved customer experience, enhanced data security and transfer of data into models	<ul style="list-style-type: none"> Home improvement companies using visual analytics to deliver an immersive customer experience and AI solutions for smart inventory solutions Online streaming companies using analytics to predict customer choices
Cybersecurity	Protect sensitive data, fulfill compliance requirement, increased customer trust, early detection and response mechanism and remote work security	<ul style="list-style-type: none"> Banks using cybersecurity to ensure highest level of security for customer's personal data Aerospace and defense companies using robotics to automate processes
RPA	Increase efficiency, reduce human error, time saving and better security	<ul style="list-style-type: none"> Process manufacturing companies using RPA to automate repetitive processes

Source: Crisil Intelligence

Companies are adapting these digital processes in their businesses. A few instances are listed below:

1. Aditya Birla Sun Life Insurance has launched a 3D virtual lounge, enabling customers to interact with experts and agents and increase communication opportunities
2. Airtel has partnered with Secure Motors to enable 1.3 million Narrow Band IoT smart meters in Bihar, ensuring uninterrupted data transfer
3. NVIDIA has partnered with Reliance Industries and Tata Group to build on AI, cloud and generative applications
4. Apollo Hospitals has partnered with Google Cloud to boost its healthcare services in India
5. JP Morgan has partnered with six Indian banks to settle interbank transactions using its blockchain trading platform

Long-term trends in the Indian IT services industry

Increasing pace of digitisation

Businesses continue to invest in digitisation by making more cost-conscious decisions and value-driven investments to support long-term sustainability. The aim is to mitigate risks and insulate from financial and regulatory shocks. India is a

preferred global IT services outsourcing location for global clients because of its digitally skilled workforce, supportive policies, robust infrastructure, and lower cost. Some of the sectors that are at the forefront of digitisation are as follows:

Sector	Business processes undergoing digitisation
BFSI	Credit underwriting, loan processing, payment systems, customer service, customer onboarding and identity verification
Transportation	Online bookings, customer support, price optimisation and customer experience
Media and entertainment	Content production, analytics-based marketing, predicting customer preference and customer experience
Government	Self-service portals, e-governance, digital payment system and digital public platforms

Source: Crisil Intelligence

The pace of digitisation in India has picked up led by higher mobile penetration, improved data connectivity and faster and cheaper data. Wireless data consumption in India has grown ~12 times in the past five fiscals at a CAGR of ~65%. The proportion of data subscribers is, hence, expected to rise to ~78% in fiscal 2025 from ~62% at fiscal 2020. India's 4G data rates are also among the lowest in the world. Private players are finding new opportunities driven by the digitisation drive. For instance, the quantum of retail digital payments has catapulted from Rs 140 trillion in fiscal 2017 to Rs 606 trillion in fiscal 2023. Within UPI, the quantum of person-to-merchant payments has jumped from Rs 6.2 trillion in fiscal 2021 to Rs 30.7 trillion in fiscal 2023. This increase has created a digital footprint of customers, which can be potentially used for credit analysis of customers, for which the IT players can build the infrastructure.

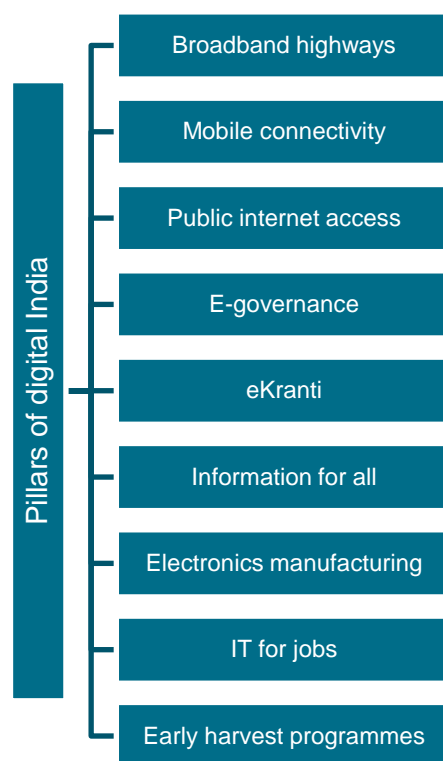
Revenue shift towards cloud, IT and analytics

Growth in digital services such as 3D printing, AI, Metaverse, block chain and big data analytics are expected to increase going forward. Crisil Intelligence expects that within the ambit of digital services, cybersecurity and cloud computing will be the two main areas of focus. Here are a few use cases: using AI for predicting business parameters such as sales and margins; using IoT for real-time tracking in logistics; and using generative AI-led chatbots as front-office aids.

Digital India drive

In fiscal 2023, Crisil Intelligence estimates that Indian IT services revenue grew 9-11% on-year, driven by the core digital transformation and the increasing demand from businesses to adopt digital technologies. Furthermore, the government's significant investment in digital initiatives, such as the digital census, is expected to contribute to this growth. The growth rate will, however, be constrained owing to pressure on billing rates because of increased competition in the domestic market.

While the establishment of digital infrastructure includes schemes such as BharatNet and the provision of free Wi-Fi at railway stations, the provision of digital services represents a significant growth area for domestic service providers. Many government service delivery programmes such as Meghraj (the government cloud platform), necessitate involvement from the private sector. This project encompasses nine major components, and among them, four pertain to IT services: e-Kranti, e-governance, Information for All and IT for Jobs.



Source: Digital India, Crisil Intelligence

Digital transformation boosts sector performance

In India, digital transformation is being led by three sectors – government, BFSI and telecom. Banks are adopting IT solutions for regulatory compliance as well as customer convenience. The telecom industry is digitising due to huge volume of voice and data, and networks. The government has pledged substantial investments in IT infrastructure as part of the Digital India and Smart Cities Mission initiatives. However, speed of implementation is a key monitorable. Healthcare expenditure has also seen an uptick due to the need in improving operational efficiencies through technology.

Key risks and challenges faced by the Indian IT services industry

Parameter	Description
Global economic uncertainty	The IT services industry is highly dependent on global economic conditions. Economic downturns or uncertainties in major markets, such as the US and Europe, can impact outsourcing decisions and IT budgets of client companies.
Currency exchange rate fluctuations	The IT services industry earns a significant portion of its revenue in foreign currencies, primarily the US dollar. Exchange rate fluctuations can impact profit margins and overall financial performance.
Competition from other countries	India faces increasing competition from other countries offering IT services such as the Philippines, China and Eastern European nations. The rise of nearshore and onshore outsourcing options may pose a threat to India's traditional dominance in offshoring.
Technological disruptions	Rapid advancements in technology, including automation, AI and robotic process automation, pose challenges to traditional IT service models. Companies need to continually adapt and invest in new skills to remain relevant.

Parameter	Description
Data security and privacy concerns	With the increasing prevalence of cyber threats and stringent data protection regulations globally, the IT services industry must continually invest in robust cybersecurity measures to protect client data and comply with international privacy standards.
Talent shortage and skill gap	There is a constant demand for highly skilled IT professionals. However, there is a challenge in sourcing and retaining top talent, particularly in emerging technologies. The industry needs to address the skill gap through training programmes and education initiatives.
Regulatory changes	Changes in global and domestic regulations can impact the operating environment for IT services companies. Compliance with regulations related to data protection, taxation and intellectual property rights is crucial.
Political and geopolitical risks	Political instability and geopolitical tensions can impact the outsourcing decisions of client companies. Trade policies, visa regulations, and political changes in key markets may affect the industry's growth prospects.
Client dependency	A high concentration of clients in specific industries or regions can expose IT services companies to the risk of disruption or downturn in those sectors.
Infrastructure challenges	Despite significant improvements, India still faces infrastructure challenges, including power shortages, transportation issues and connectivity problems, which can impact the smooth operation of IT services.

Source: Crisil Intelligence

Overview of IT Infrastructure services market in India

The IT infrastructure market is a critical component of the modern business landscape, providing the foundation for all business operations and enabling organizations to achieve their goals and objectives. IT infrastructure refers to the underlying systems, hardware, software, and networks that enable the storage, processing, and transmission of data within an organization. It is the backbone of any organization's technology ecosystem, providing the platform for all business applications and services. A well-designed and well-managed IT infrastructure is essential for organizations to operate efficiently, effectively, and securely.

In today's digital age, IT infrastructure plays a vital role in enabling organizations to compete in a rapidly changing business environment. It enables organizations to respond quickly to changing market conditions, innovate and develop new products and services, and provide high-quality customer service. The importance of IT infrastructure cannot be overstated, as it is the foundation upon which all business operations are built. A robust and reliable IT infrastructure is essential for organizations to achieve their goals and objectives, and to remain competitive in a rapidly changing business environment.

The IT infrastructure market includes a range of services, such as network services, intelligent industry services, infrastructure support application services, infrastructure safety and security services, and managed services. These services are critical to facilitating seamless IT operation and maintenance of an organization's IT infrastructure. The demand for these services is increasing, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth. The Indian government's initiatives to promote digitalization and smart city projects are also driving the growth of the domestic IT infrastructure.

The IT infrastructure market is expected to experience significant growth in the coming years, driven by the increasing demand for digital transformation, cloud computing, and cybersecurity. Businesses are seeking to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth. The adoption of cloud computing is increasing, driven by the need for flexible and scalable IT infrastructure. The hybrid and public clouds segments are expected to experience exponential growth, driven by enterprises seeking flexible and scalable infrastructure solutions.

The demand for endpoint security solutions is increasing, driven by the growing number of remote employees and the adoption of bring-your-own-device (BYOD) policies among businesses. The telecom industry is playing a crucial role in driving the growth of India's IT industry, with telecom companies investing in IT infrastructure and network solutions. The demand for data center infrastructure is increasing, driven by need for scalable and efficient IT infrastructure. Overall, the IT infrastructure market is expected to experience significant growth in the coming years, driven by the increasing demand for digital transformation, cloud computing, and cybersecurity.

As organizations continue to evolve and grow, their IT infrastructure must also evolve to meet changing business needs. This requires ongoing investment in new technologies, such as cloud computing, artificial intelligence, and the Internet of Things (IoT), as well as ongoing maintenance and management of existing infrastructure. The IT infrastructure market is a critical component of the modern business landscape, providing the foundation for all business operations and enabling organizations to achieve their goals and objectives. With the increasing demand for digital transformation, cloud computing, and cybersecurity, the IT infrastructure market is expected to experience significant growth in the coming years.

Growth drivers of Indian IT infrastructure services

Parameter	Description
Digital Transformation	Increasing demand for digital transformation is driving the growth of the IT infrastructure market. Businesses are seeking to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth. The focus on digital transformation and modernization is also pushing businesses to invest more in IT infrastructure and services. As organizations continue to evolve and grow, their IT infrastructure must also evolve to meet changing business needs, requiring ongoing investment in new technologies, such as cloud computing, artificial intelligence, and the Internet of Things (IoT)
Adoption of cloud computing	The adoption of cloud computing is increasing, driven by the need for flexible and scalable IT infrastructure. The hybrid and public clouds segments are expected to experience exponential growth, driven by enterprises seeking flexible and scalable infrastructure solutions that combine on-premises resources with public cloud capabilities. The rising popularity of the Infrastructure-as-a-Service (IaaS) industry in India has been stimulated by the government's initiative for cloud adoption as well as the growing need for scalable and affordable IT infrastructure.

Parameter	Description
Increasing endpoint security	The demand for endpoint security solutions continues to be stimulated by the growing number of remote employees in India and the increasing adoption of bring-your-own-device (BYOD) policies among businesses. Businesses are increasingly investing in cutting-edge endpoint protection systems to protect their distributed IT infrastructures. The demand for cybersecurity solutions is increasing, driven by the growing number of cyber threats and the need for organizations to protect their sensitive information and prevent data breaches.
Government Initiatives	Increased government expenditure on digital initiatives and smart city projects is boosting IT adoption across public sectors. This has encouraged the improvement and growth of the domestic IT infrastructure, such as internet access, data centers, and cloud computing. The Indian government's initiatives to promote digitalization and smart city projects are driving the growth of the domestic IT infrastructure market, as organizations seek to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.
Growth of Telecom sector	The telecom industry continues to play an important role in driving the growth of India's IT industry. Telecom companies are increasingly investing in IT infrastructure and network solutions, focusing on the rollout of 5G networks and increasingly focusing on digital services. These initiatives are crucial, as they serve as a backbone for digital transformation initiatives among businesses in India. The demand for telecom services is increasing, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.
Data Center Infrastructure	Demand for data center infrastructure is increasing, driven by the need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth. To meet their rising business requirements and demand, organizations are investing in updating and expanding data center infrastructure. Capacity growth involves the construction of new data centers or the expansion of existing data centers, to meet the rising demand for computing and storage resources. The data center infrastructure market is expected to experience significant growth, driven by the increasing demand for cloud computing, big data analytics, and the Internet of Things (IoT).

Source: Crisil Intelligence

Overview of select offerings in IT Infrastructure services

Network Services

Network services are a critical component of IT infrastructure, enabling organizations to communicate and exchange data efficiently. The increasing demand for digital transformation and cloud computing has led to a growing need for network

services that can support high-speed data transfer and low latency. Network services include a range of solutions, such as local area networks (LANs), wide area networks (WANs), and wireless networks, that enable organizations to connect their devices and systems. These services are essential for organizations to operate efficiently, as they enable the exchange of data and communication between different departments, locations, and stakeholders.

The adoption of network services is expected to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth. The increasing demand for cloud computing, big data analytics, and the Internet of Things (IoT) is driving the need for network services that can support high-speed data transfer and low latency. Network services are also critical for organizations to ensure the security and reliability of their IT infrastructure, as they enable the implementation of security measures such as firewalls, intrusion detection systems, and encryption. As organizations continue to evolve and grow, their network services must also evolve to meet changing business needs, requiring ongoing investment in new technologies and solutions.

Intelligent Industry Services

Intelligent industry services refer to the use of advanced technologies such as artificial intelligence, machine learning, and the Internet of Things (IoT) to improve the efficiency and effectiveness of industrial operations. These services enable organizations to collect and analyze data from various sources, such as sensors and machines, to optimize their operations and improve their decision-making. Intelligent industry services include a range of solutions, such as predictive maintenance, quality control, and supply chain optimization, that enable organizations to improve their productivity and reduce their costs. The adoption of intelligent industry services is expected to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.

The increasing demand for intelligent industry services is driven by the need for organizations to improve their efficiency and effectiveness, and to reduce their costs and improve their profitability. These services enable organizations to collect and analyze data from various sources, such as sensors and machines, to optimize their operations and improve their decision-making. Intelligent industry services are also critical for organizations to ensure the security and reliability of their IT infrastructure, as they enable the implementation of security measures such as encryption and access control. As organizations continue to evolve and grow, their intelligent industry services must also evolve to meet changing business needs, requiring ongoing investment in new technologies and solutions.

Infrastructure Support Application Services

Infrastructure support application services refer to the range of services that enable organizations to manage and maintain their IT infrastructure, including their applications, data, and systems. These services include a range of solutions, such as application management, data management, and system management, that enable organizations to ensure the availability, performance, and security of their IT infrastructure. The adoption of infrastructure support application services is expected

to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.

The increasing demand for infrastructure support application services is driven by the need for organizations to ensure the availability, performance, and security of their IT infrastructure. These services enable organizations to manage and maintain their IT infrastructure, including their applications, data, and systems, to ensure that they are running efficiently and effectively. Infrastructure support application services are also critical for organizations to ensure the security and reliability of their IT infrastructure, as they enable the implementation of security measures such as backup and disaster recovery, and access control. As organizations continue to evolve and grow, their infrastructure support application services must also evolve to meet changing business needs, requiring ongoing investment in new technologies and solutions.

Infrastructure Safety and Security Services

Infrastructure safety and security services refer to the range of services that enable organizations to protect their IT infrastructure from cyber threats and other security risks. These services include a range of solutions, such as firewall configuration, intrusion detection, and encryption, that enable organizations to ensure the security and reliability of their IT infrastructure. The adoption of infrastructure safety and security services is expected to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.

The increasing demand for infrastructure safety and security services is driven by the need for organizations to protect their IT infrastructure from cyber threats and other security risks. These services enable organizations to implement security measures such as firewall configuration, intrusion detection, and encryption, to ensure the security and reliability of their IT infrastructure. Infrastructure safety and security services are also critical for organizations to ensure compliance with regulatory requirements, such as data protection and privacy laws. As organizations continue to evolve and grow, their infrastructure safety and security services must also evolve to meet changing business needs, requiring ongoing investment in new technologies and solutions.

Managed Services

Managed services refer to the range of services that enable organizations to outsource the management and maintenance of their IT infrastructure to a third-party provider. These services include a range of solutions, such as network management, system management, and application management, that enable organizations to ensure the availability, performance, and security of their IT infrastructure. The adoption of managed services is expected to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.

The increasing demand for managed services is driven by the need for organizations to reduce their costs and improve their efficiency, while ensuring the availability, performance, and security of their IT infrastructure. Managed services enable organizations to outsource the management and maintenance of their IT infrastructure to a third-party provider, freeing up internal resources to focus on core business activities. Managed services are also critical for organizations to ensure the

security and reliability of their IT infrastructure, as they enable the implementation of security measures such as backup and disaster recovery, and access control. As organizations continue to evolve and grow, their managed services must also evolve to meet changing business needs, requiring ongoing investment in new technologies and solutions.

Overview of impact of AI on IT infrastructure services

The impact of Artificial Intelligence (AI) on IT infrastructure is expected to be significant, with the potential to transform the way IT infrastructure is designed, implemented, and managed. AI-driven technologies and approaches are expected to play a crucial role in predicting and preventing IT infrastructure failures, optimizing IT infrastructure performance, and improving the overall efficiency and effectiveness of IT infrastructure. The adoption of AI is expected to increase significantly in the coming years, with 61% of executives agreeing that AI will fundamentally change their IT infrastructure procurement and consumption model over the next five years.

The use of AI in IT infrastructure is expected to have a multiplier impact on businesses and IT, with the potential to predict slowdowns or errors and determine how to avoid or fix them. AI-driven technologies and approaches are expected to play a crucial role in network services, intelligent industry services, infrastructure support application services, infrastructure safety and security services, and managed services. The adoption of AI is expected to improve the overall efficiency and effectiveness of IT infrastructure, enabling organizations to respond quickly to changing market conditions, innovate and develop new products and services, and provide high-quality customer service.

The impact of AI on IT infrastructure will be felt across all industries, with the potential to transform the way businesses operate and compete. The adoption of AI-driven technologies and approaches is expected to improve the overall efficiency and effectiveness of IT infrastructure, enabling organizations to achieve their goals and objectives. The use of AI in IT infrastructure is expected to increase significantly in the coming years, driven by the growing need for organizations to upgrade their IT infrastructure and digital platforms to remain competitive and achieve sustainable growth.

The adoption of AI is expected to have a significant impact on the IT infrastructure market, with the potential to transform the way IT infrastructure is designed, implemented, and managed. AI-driven technologies and approaches are expected to play a crucial role in predicting and preventing IT infrastructure failures, optimizing IT infrastructure performance, and improving the overall efficiency and effectiveness of IT infrastructure. The use of AI in IT infrastructure is expected to have a multiplier impact on businesses and IT, with the potential to predict slowdowns or errors and determine how to avoid or fix them.

As AI continues to evolve and improve, its impact on IT infrastructure is expected to grow, with the potential to transform the way businesses operate and compete. The adoption of AI-driven technologies and approaches is expected to improve the overall efficiency and effectiveness of IT infrastructure, enabling organizations to respond quickly to changing market conditions, innovate and develop new products and services, and provide high-quality customer service. The impact of AI on IT infrastructure will be felt across all industries, with the potential to transform the way businesses operate and compete.

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Overview of ITeS (IT-enabled services) Industry

IT-enabled services (ITeS) encompass a broad spectrum of services that leverage information technology for providing services with the help of internet. The Indian ITeS Companies' services lie under three different categories which are Customer Relationship Management (CRM), Transaction Services and Knowledge Services.

Services provided by Indian ITeS companies

Customer Relationship Management (CRM)	Transaction Services	Knowledge Services
<ul style="list-style-type: none"> • Customer Support • Marketing • Data Entry • Contact Centres • Technical Support • Employee Helpdesks • Telemarketing/Telesales • Account Maintenance/ Service Dispatch 	<ul style="list-style-type: none"> • Payment Gateways • E-commerce solutions • Digital Wallets • Finance & Accounting • Treasury & Risk Management • Administrator • Payment Services • Human Resource Management 	<ul style="list-style-type: none"> • Business Research • Legal Research • Market Research • Legal Process Outsourcing • Data Analytics • Healthcare operations • Animation • Education & Publishing

Source: Crisil Intelligence

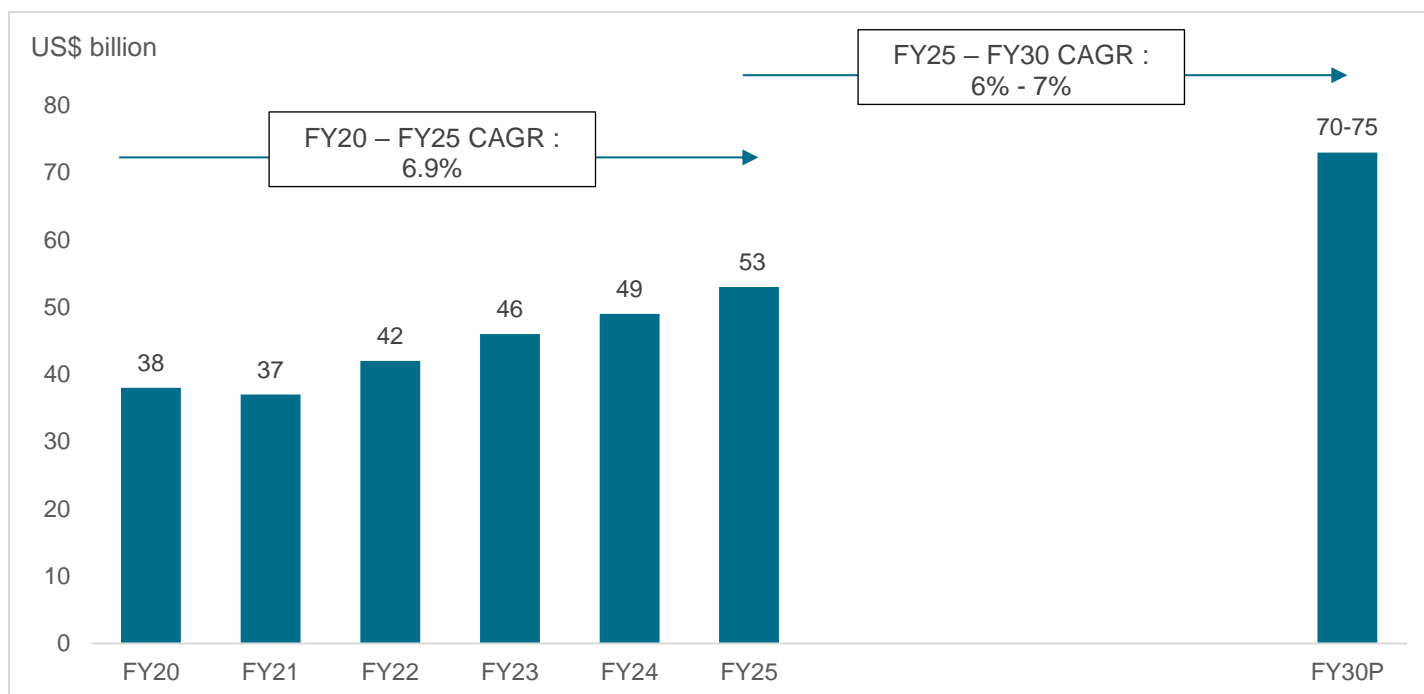
Indian ITeS Industry market

Growth in key economies to weigh on Indian ITeS Industry

ITeS refers to outsourcing processes in which the provider utilises technologies to meet the business goals of global companies. It provides a gamut of services that exploit technology to improve organisations. Outsourcing saves client money and boosts the economic progress of the country providing the service by creating more jobs.

Over the years, the Indian ITeS industry has undergone a transformation with emergence of new technological advancements in areas like process improvement, data analysis, and automation. The global IT companies have increased investments in cutting-edge technologies like robotics, 3D printing, the Internet of Things (IoT) and connected devices, and the integration of social, mobile, analytics, and cloud (SMAC) solutions & the Indian service providers are able to derive significant benefits of this owing to their ability to offer domain-specific services and leverage big data analytics to achieve meaningful business results.

ITeS market in India



Note: E: Estimated, P: Projected, Source: NASSCOM, Crisil Intelligence

The Indian ITeS Industry grew by 6.9% from fiscal 2020 to fiscal 2025 due to growth in non-voice and omni channel CRM segments and also knowledge services. Indian ITeS companies have seen robust orders from clients globally which have led to volume pick up since fiscal 2022. Skilled employee additions have also fuelled the growth of the industry for both domestic and export markets.

In fiscal 2025, ITeS market have grown at 7.5% over the previous year. This is on account of existing order book which has not been impacted by the global slowdown as spending in this industry is mostly non-discretionary. However, global slowdown and economic growth in key economies will be a key monitorable and can weigh in on the growth. CRISIL believes that improvement in recovery in the US and UK market, which form ~80% of the revenue of the Indian ITeS industry, will lead to revival in volume across segments.

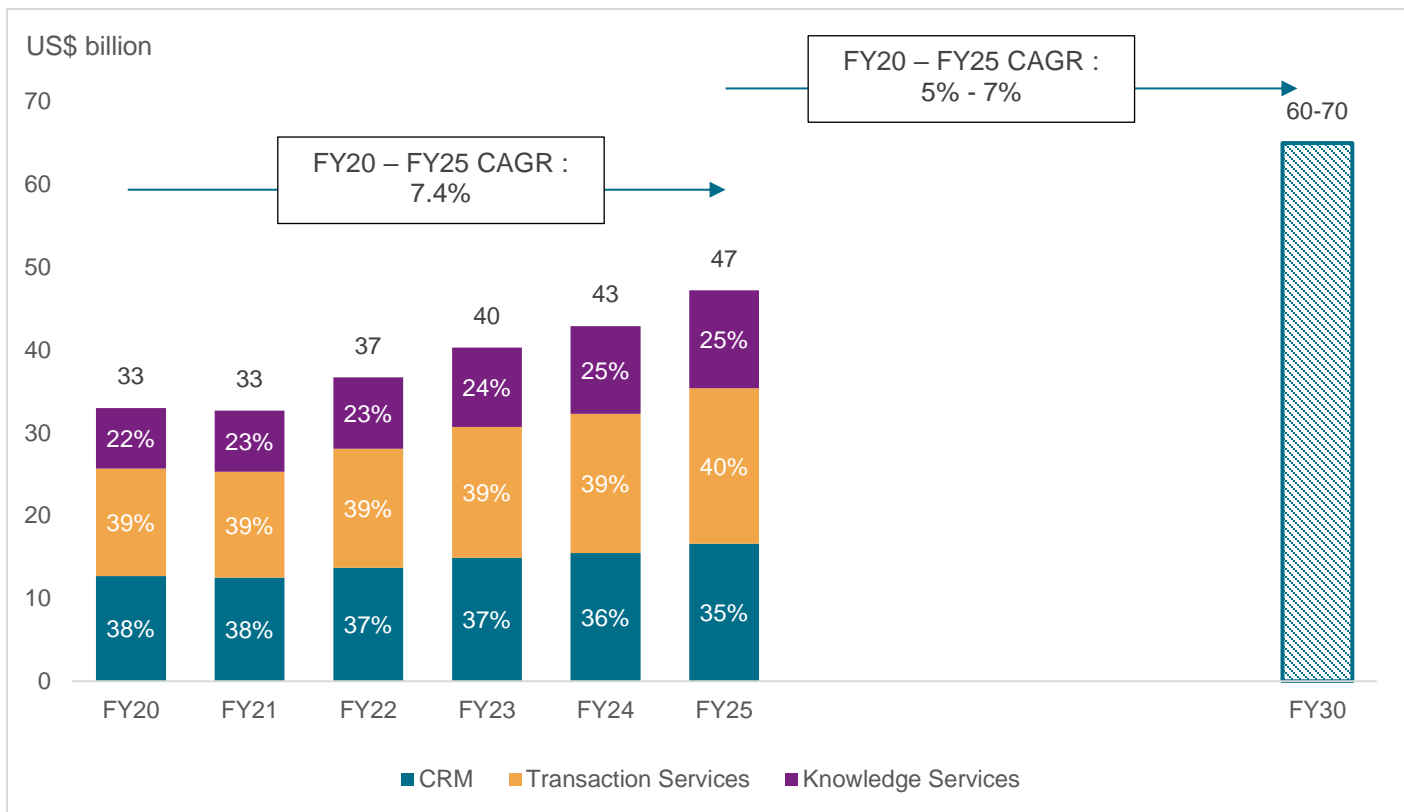
Revenue trend of different segments of ITeS exports

ITeS sector's overall export revenue has grown by 7.4% from fiscal 2020 to fiscal 2025 in dollar terms, reaching approximately \$47 billion. Indian ITeS companies reported record-high order wins in the second half of fiscal 2024. Between fiscals 2025 and 2030, exports are projected to grow at a compound annual growth rate (CAGR) of 5%-7%. This growth will be driven by the rapid expansion of knowledge services, as clients increasingly adopt analytics and robotic process automation (RPA) alongside business research. In the customer relationship management (CRM) space, however, growth is expected to slow due to competition in the voice-based segment from the Philippines and a shift towards chatbot-based solutions. Similarly, growth in transactional services is likely to moderate due to the commoditization and automation of rule-based tasks.

The BFSI segment has witnessed increased spending on automation and enhanced customer experience solutions, with significant investments directed toward chatbot-based technologies, which are expected to drive future growth in this segment. Meanwhile, revenue growth in retail and healthcare is anticipated to be bolstered by their transition to RPA-based solutions.

The telecom sector's performance remains under observation. Over the medium term, while revenue growth in this sector is likely, stagnant volume growth is expected to limit its contribution to the ITeS sector, potentially leading to a reduction in business opportunities.

Revenue trend of different segments of ITeS exports



Note: E: Estimated, P: Projected; Source: NASSCOM, Crisil Intelligence

Shift towards non voice CRM to drive the growth

Customer relationship management (CRM) segment has grown slower than the industry average in the last five years owing to intense competition from the Philippines in the voice segment. In India, growth will be driven by a shift towards non-voice and multi-channel artificial intelligence-powered CRM. Growth is expected in coming uyears on account of the shift towards non voice CRM which is considered as a premium service. Organizations have realized that digital transformation enhanced the customer experience and as a result the integration of emerging technologies across different business verticals to improve customer experience and value delivery support

Growth to be led by Digital Payments and credit card collections in the Transaction Services segment

Transaction services exports accounted for approximately 40% of total export revenue, reaching around \$19 billion in fiscal 2025. Growing need for digitization in the BFSI segment, along with a volume revival in mortgage processing, insurance, and collections, is expected to drive this ITeS segment's growth

Of ~\$19 billion revenue from transaction services in fiscal 2025, finance and accounting (F&A) services contributed ~57-60%, vertical-specific services such as insurance claims processing accounted for 33-35%, with human resource outsourcing (HRO) and others constituting the remainder.

F&A services are slowly becoming commoditized. WNS recently applied a transformation solution to one of its electronic clients for the streamline of its F&A division, which resulted in 85% reduction in accounts payable over 90 days and a 25% improvement in efficiency. Growth will primarily be driven by players embedding more digital solutions into their F&A offerings.

BFSI, telecom and healthcare sectors remain key customers of transaction services, with the banking, financial services, and insurance (BFSI), telecom and healthcare sectors traditionally accounting for 60-70% of the sector's revenue, a similar trend is estimated in upcoming years

Knowledge services growth to surpass industry average

Knowledge services segment has grown by ~10% from fiscal 2020 to fiscal 2025 in dollar terms, led by demand for financial, legal, and market research, led by demand recovery for financial and market research. The content management services vertical within this segment have also gained momentum recently, adding to overall ITeS growth. Knowledge services are likely to be the fastest-growing, driven by high-value services such as big data analytics and artificial intelligence (AI)-based automation.

The knowledge services segment of the information technology-enabled services (ITeS) industry comprises knowledge-intensive processes such as business research, market research, data management, and data analytics. This segment is expected to grow with a further pickup in volumes for research-based projects and content management services.

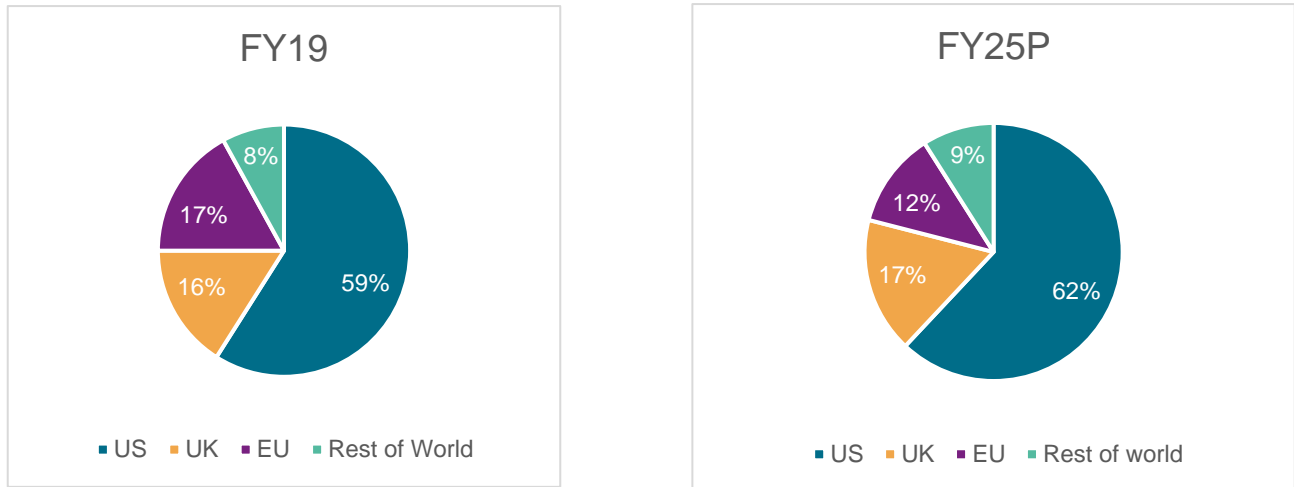
Key geographies driving Indian ITeS export market

EU market losing share to US market, share of emerging markets increasing

Geographical and vertical-related risks persist in the Indian ITeS industry. The US has traditionally accounted for more than 62% of India's ITeS export revenue. For the set of three major Indian ITeS players, the concentration of US has increased at 4% CAGR between fiscals 2019 to 2024, exposing it to major revenue risk, should the negative sentiments continue in US.

To counter geopolitical risks arising from US, companies have started setting up delivery centres in other regions. For example, ITeS players have tried to diversify in the Middle East and Asia-Pacific region by setting up delivery centres and targeting clients there. Middle eastern companies are on a digitisation drive providing new opportunities for Indian ITeS companies.

Share of key geographies for Indian ITeS sector for fiscal 2019 and fiscal 2025



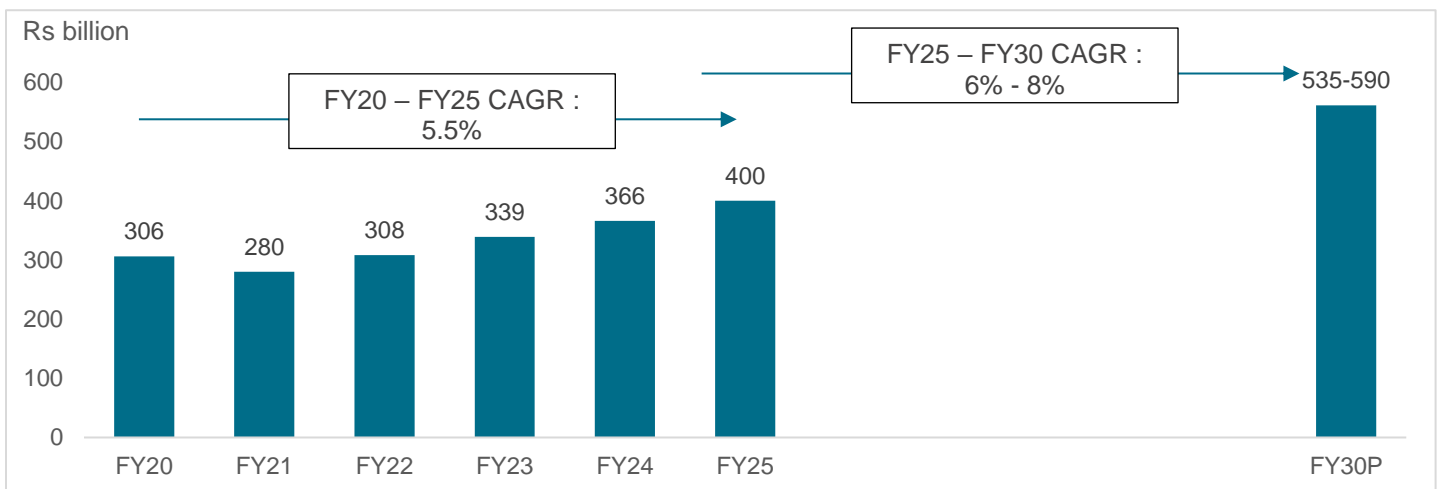
Source: Company reports, Crisil Intelligence

Domestic ITeS Industry

The volume recovery in the healthcare and government sectors supported the ITeS industry in fiscal 2025, resulting in a growth of 5.5% to reach approximately 400 billion. Sectoral volumes are expected to be driven by the banking, financial services, and insurance (BFSI) and telecom sectors.

Crisil Intelligence estimates the domestic revenue of information technology-enabled services (ITeS) companies to grow at a compounded annual growth rate (CAGR) of 6-8% between fiscals 2025 and 2030, driven by an increase in volumes due to digitization, to reach approximately Rs 535-590 billion by fiscal 2030.

Spend in BFSI and government verticals to lead domestic revenue growth



Note: E: Estimated, P: Projected; Source: NASSCOM, Crisil Intelligence

Domestic ITeS will continue to take a backseat vis-à-vis exports

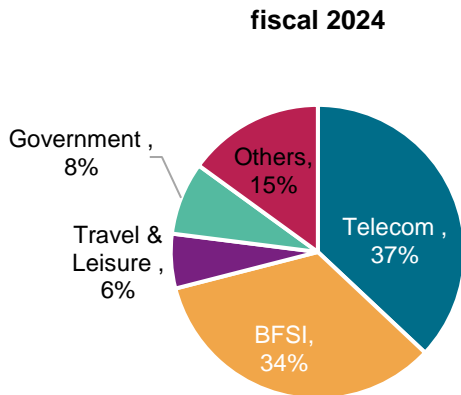
Key players in the ITeS industry are reorienting their attention towards international markets because the domestic sector is witnessing diminishing profitability.

As the capital expenditure required to set up a Business Processing Outsourcing unit is low as compared to most sectors, domestic market has many small players competing for contracts. This has led to increased competition and pressure on billing rates and hence on profitability of companies. Another factor that contributes to reduced profit margins in the domestic market, in contrast to the export market, is the smaller proportion of high-value offerings like knowledge services. Domestic players face higher employee costs as a percentage of sales due to lower billing rates.

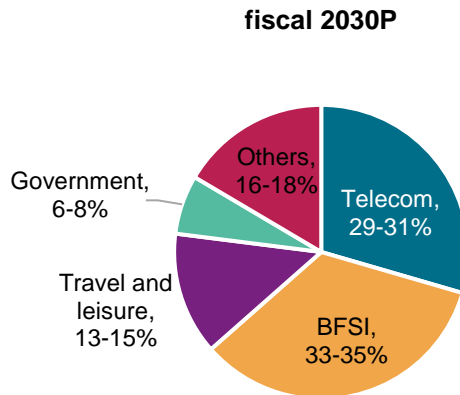
Revenue contribution by respective sectors in domestic ITeS market

Telecom and BFSI (banking, financial services and insurance) together constituted 70% of the domestic ITeS (information technology enabled services) sector's domestic revenue in fiscal 2024. While this trend is expected to continue in fiscals 2025, telecom is expected to lose its share, due to the pressures that the industry is facing in terms of revenues. Financial inclusion is increasing the share of digital transactions, providing opportunities in the BFSI segment. Government initiatives to digitise records should drive growth in non-voice revenue.

Segmentation of revenue by sectors



Note: E: Estimated, 'Others' consists of healthcare, retail etc
Source: NASSCOM, Crisil Intelligence



Note: P: Projected, 'Others' consists of healthcare, retail etc
Source: NASSCOM, Crisil Intelligence

Key trends and drivers in ITeS industry

Roll-out of 5G to aid growth for telecom sector

In the past, a substantial portion of the domestic ITeS revenue came from customer-interaction services. However, there is now a shift towards the adoption of more advanced and resource-efficient technologies, including chatbots and self-service applications, in addition to the already widely used interactive voice response systems (IVRS).

Digital payments and financial inclusion to drive growth

Financial inclusion, the expansion of payment banks, and government initiatives promoting a cashless economy are projected to create favourable prospects within the domestic ITeS market. A key driver of volume, especially in the BPO services space, is the need to service banking customers. Banks have been prioritizing the development of self-service platforms and chatbots to improve their interactions and engagement with current customers. Additionally, the rise in digital transactions is expected to create more opportunities for private players, particularly in the field of financial analytics.

Digital India to drive government spending on ITeS

As part of its Digital India initiative, the Indian government has aimed to boost employment opportunities in the ITeS sector. To achieve this goal, two schemes have been introduced: the India BPO Promotion Scheme (IBPS) and the Northeast BPO Promotion Scheme. The IBPS has been approved under Digital India to incentivize ITeS operations across the country. While there is no risk of default, issues related to timelines of receivables remain key risks for revenue from the government segment, as they are usually delayed.

Adoption of non-voice CRM

Customer relationship management (CRM) segment is expected to grow this fiscal due to immediate volume recovery in outbound-based voice calls, supply restoration. However, a shift to non-voice channels focused more on digital interaction is expected to drive growth for Indian companies. India has considerable expertise in non-voice CRM, where language and cultural handicaps are not exposed as much. As a result, India is expected to retain its global share in CRM, aided by non-voice segments.

Increasing adoption of Robotic process automation and decision-based analytics

The increasing adoption of Robotic Process Automation (RPA) across industries is poised to be a significant growth driver for the ITeS sector, with the banking, financial services, and insurance (BFSI) and healthcare segments leading the charge. As the US and UK continue to pioneer the adoption of RPA-based solutions, Indian ITeS players are seizing opportunities to collaborate with technology vendors, such as EXL's partnership with Automation Anywhere, to offer customized and advanced automation solutions.

Key risks and challenges faced by the industry

Competition from Philippines and near shore destinations in the voice space

The Indian ITeS industry faces significant challenges in the voice services segment, particularly from the Philippines, which has emerged as the preferred destination for such services. The country's neutral English accent, cultural affinity with the United States, and comparable employee costs to India make it an attractive alternative for clients. Furthermore, the Filipino government's supportive policies, including a concessional tax rate of 5% of gross income and exemptions from duties and taxes on equipment imports, have created a favorable business environment that is difficult for India to match. As a result, the Philippines' ITeS industry has experienced rapid growth, with its contribution to the country's GDP increasing from ~8% in 2019 to ~12% in 2023.

Geopolitical uncertainties:

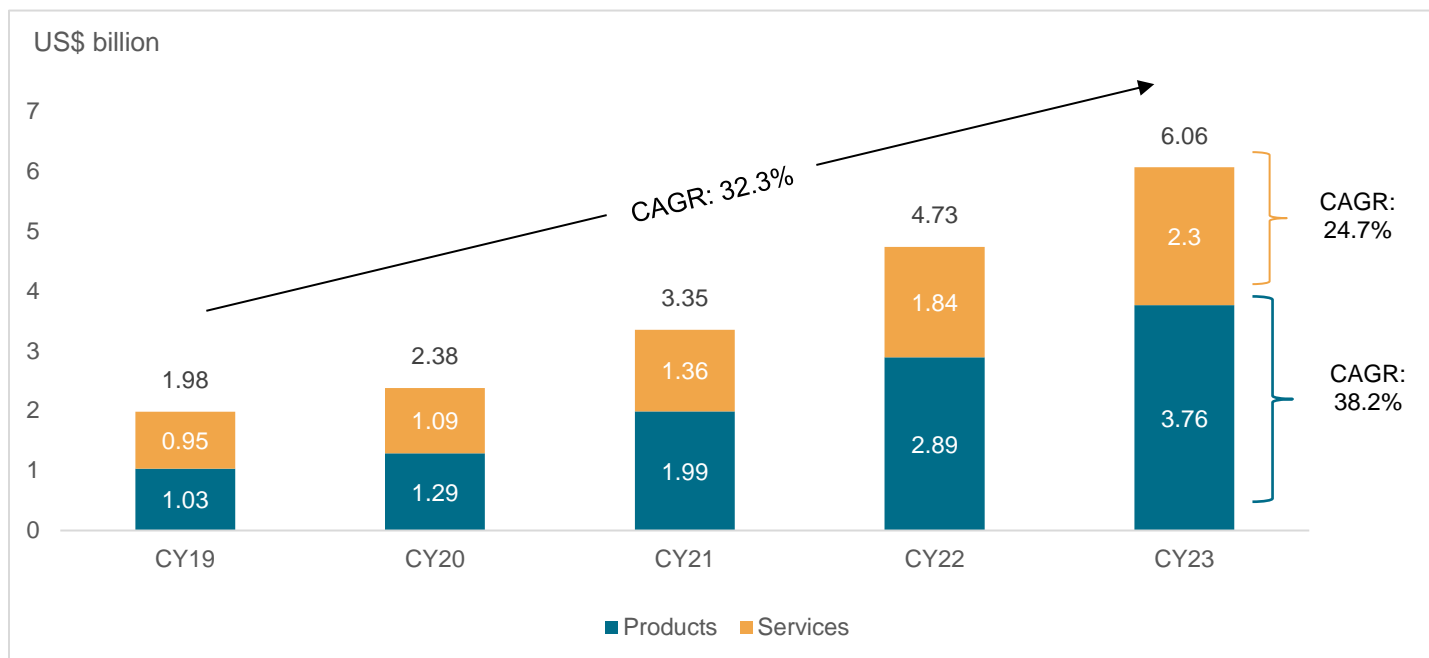
Tax tariff uncertainties, exacerbated by global events such as the Russia-Ukraine war, which is impacting spending by EU clients, pose another significant challenge for the Indian ITeS industry, as clients from the EU market may reduce their outsourcing budgets amidst economic instability, further compounding the challenges posed by anti-outsourcing sentiments in the USA and Brexit uncertainty.

2. Overview of Cybersecurity Market in India

Indian cybersecurity market has grown from \$1.98 billion in CY19 to \$6.06 billion in CY23, representing a CAGR of 32.3%. The products segment has grown from \$1.03 billion in CY19 to \$3.76 billion in CY23, with a CAGR of 38.2%. The services segment has grown from \$0.95 billion in CY19 to \$2.3 billion in CY23, with a CAGR of 24.7%, driven by digital transformation initiatives and the need for regulatory compliance. The growth was fueled by the increased adoption of emerging technologies such as Artificial Intelligence (AI), Machine Learning (ML), cloud computing, and the Internet of Things (IoT). The market growth was also driven by the need for organizations to protect themselves from evolving cyber threats and to ensure business continuity.

Government's initiatives, such as the Digital India program, have also contributed to the growth of the cybersecurity market. The government's focus on digital transformation and the increasing use of technology in various sectors have created a need for robust cybersecurity measures. Additionally, the government's allocation of funds for cybersecurity projects and the establishment of the National Cyber Coordination Centre (NCCC) have further boosted the growth of the market.

Cybersecurity market of India



Source: DSCI

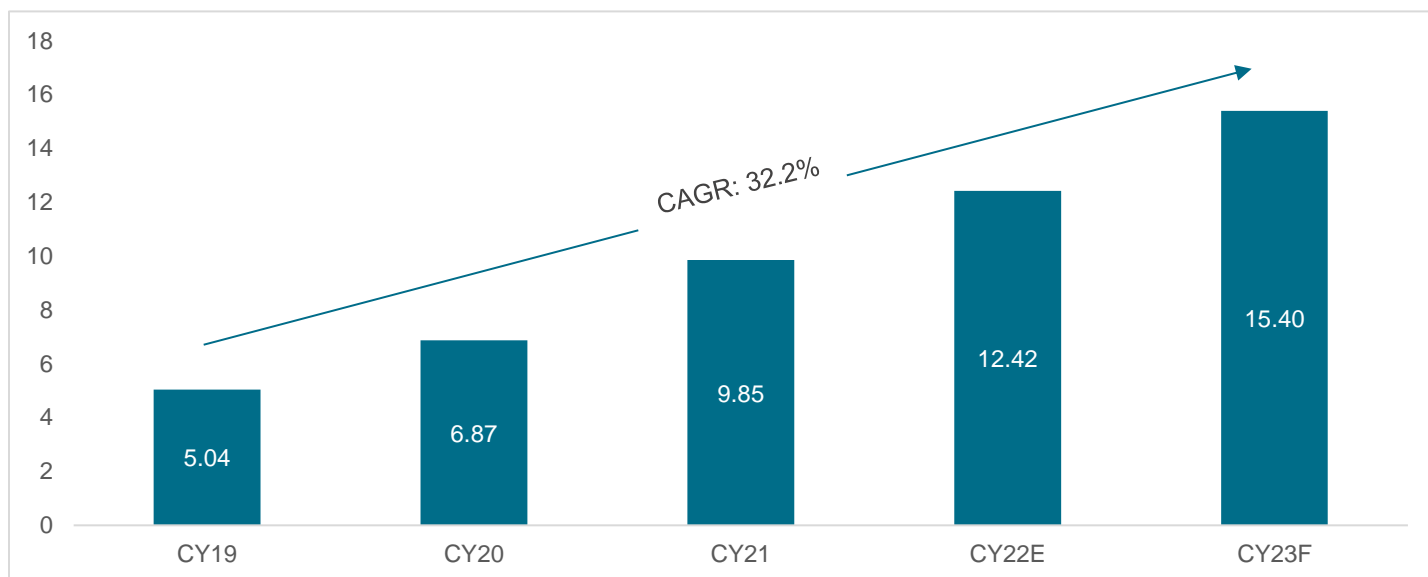
Domestic market has also seen significant growth due to the increasing demand for cybersecurity solutions from various industries, including Banking, Financial Services, and Insurance (BFSI), IT and IT-enabled Services (ITeS), and manufacturing. These industries have been at the forefront of adopting digital technologies, and as a result, they have become more vulnerable to cyber threats. To mitigate these threats, they have been investing heavily in cybersecurity solutions, which has driven the growth of the market.

The growth of the market has also been driven by the increasing awareness among organizations about the importance of cybersecurity. Organizations have realized that cybersecurity is no longer just an IT issue, but a business issue that requires attention from the top management. As a result, they have been investing in cybersecurity solutions and services to protect their businesses from cyber threats. The market is expected to continue growing in the future, driven by the increasing demand for cybersecurity solutions and services from various industries.

Overview of cybersecurity industry revenue

The industry's revenue has increased from USD 5.04 billion in 2019 to USD 15.40 billion in 2023, representing a CAGR of ~32%. The key drivers of this growth are the adoption of cloud-first strategies, business-led innovation due to remote working conditions, a growing threat landscape and awareness around threats, and global and domestic regulations around compliance and data privacy. As a result, the industry is expected to continue growing, with revenue projections indicating a significant increase in the coming years, driven by the increasing demand for cybersecurity solutions and services to protect against evolving cyber threats and ensure compliance with regulatory requirements.

Cybersecurity industry revenue in Indian market



Source: DSCI

Indian cybersecurity industry has seen significant investments and growth, driven by the increasing demand for cybersecurity solutions and services. Indian companies are focusing on developing and providing a range of cybersecurity solutions, including security consulting and advisory services, Managed Security Services (MSS) and Shared Services, cloud security solutions, Identity and Access Management (IAM) solutions, Governance, Risk, and Compliance (GRC) solutions, and Security Orchestration, Automation, and Response (SOAR) solutions

Companies are also investing in research and development to create innovative cybersecurity solutions, including those using AI and ML. For example, some companies are developing AI-powered threat detection and incident response solutions, while others are developing ML-based predictive analytics solutions to identify potential cyber threats. These

innovative solutions are helping Indian companies to differentiate themselves in the market and to attract customers from around the world. Cybersecurity industry is also seeing significant growth due to the increasing demand for cybersecurity solutions from the government sector. The government has been investing heavily in cybersecurity solutions to protect its critical infrastructure and to ensure the security of its citizens' data. Indian companies are well-positioned to capitalize on this demand, given their expertise in providing cybersecurity solutions and services.

Industry is also seeing growth due to the increasing adoption of cloud computing and the IoT. As more and more organizations move to the cloud and adopt IoT technologies, they are becoming more vulnerable to cyber threats. Indian companies are developing cloud security solutions and IoT security solutions to help organizations protect themselves from these threats. The growth of the industry is expected to continue in the future, driven by the increasing demand for cybersecurity solutions and services from various industries.

Overview of impact of AI on the industry

The increasing use of AI and ML is having a significant impact on the cybersecurity industry. AI and ML are being used to enhance cybersecurity solutions, including threat detection and incident response, predictive analytics and anomaly detection, automated security orchestration and response, and IAM. AI and ML are also being used to improve the efficiency and effectiveness of cybersecurity solutions, by automating routine tasks and providing real-time threat intelligence.

The use of AI and ML in cybersecurity is also changing the way organizations approach cybersecurity. Organizations are no longer just relying on traditional security measures such as firewalls and antivirus software, but are instead using AI and ML-powered solutions to detect and respond to cyber threats in real-time. This is helping organizations to stay ahead of cyber threats and to protect themselves from evolving threats.

However, the use of AI and ML in cybersecurity also poses significant challenges. For example, AI and ML-powered solutions require large amounts of data to function effectively, which can be a challenge for organizations that do not have access to such data. Additionally, AI and ML-powered solutions can be complex and difficult to implement, which can be a challenge for organizations that do not have the necessary expertise.

Despite these challenges, the use of AI and ML in cybersecurity is expected to continue growing in the future. As cyber threats continue to evolve and become more sophisticated, organizations will need to use AI and ML-powered solutions to stay ahead of these threats. The use of AI and ML in cybersecurity will also help organizations to improve the efficiency and effectiveness of their cybersecurity solutions, and to reduce the risk of cyber-attacks. Overall, the impact of AI on the cybersecurity industry is significant, and is expected to continue growing in the future.

Growth drivers and trends in the industry

Parameter	Description
Regulatory Requirements and Compliance	Stringent regulatory requirements, ensuring data privacy and protection, and rise in digital discoveries drive demand for data and privacy offerings, GRC, cloud security, and IAM in the BFSI sector. National regulations, policies, guidelines, and frameworks, including the DPDP Act 2023, and global regulations, such as GDPR and HIPAA, are significant drivers for privacy offerings in India.
Digital Transformation and Emerging Technologies	Large conglomerates are driving cybersecurity spending through digital transformation imbued with cybersecurity. The rapid pace of digital transformation, propelled by government initiatives, dynamic startup ecosystem, widespread mobile and internet access, advancements in 5G technology, and the adoption of AI/ML, is fueling increased investment in cybersecurity.
Government Initiatives and Investments	Government with 5G, smart city projects, Digital India, Digital inclusion, API Setu, India Stack Global, and Global Digital Public Infrastructure Repository, is emerging as high potential market. The government's initiatives and investments in digital transformation are driving the demand for cybersecurity solutions and services.
Adoption of AI/ML and Cloud	Increased adoption of AI/ML and cloud is driving the demand for cybersecurity solutions and services. GenAI has gained significant traction with organizations investing in GenAI to support various functions such as content creation, automating designing, enhancing datasets, drug discovery, and demand forecasting
Remote Working and Borderless Networks	The outbreak of COVID-19 pandemic has surged the trend for remote working and the enterprise networks have gone borderless. This change is ramping up infrastructure, endpoint, and cloud security spend. Gartner forecasted that 51% of Global Knowledge Workers will be remote by the end of 2021, driving the demand for cybersecurity solutions and services.
Cybersecurity Spending in Key Sectors	Securing customer and employee data, facilitating secure hybrid working, and deploying emerging technologies are leading to investments in tighter operations and technical controls, such as encryption, DLP, etc., in the IT and ITeS sector. The BFSI sector is also driving demand for data and privacy offerings, GRC, cloud security, and IAM, due to the need to protect sensitive customer data and ensure compliance with regulatory requirements.

Source: Crisil Intelligence

Key Government Initiatives:

National Centre of Excellence (NCoE): The National Centre of Excellence, a collaborative effort between DSCI and MeitY, aims to foster the growth of deep tech security startups and accelerate the development of cybersecurity technologies in India. One of its primary objectives is to bridge the gap between research and development, and the creation of innovative cybersecurity products.

Cybersecurity Centre of Excellence (CCoE): The Cybersecurity Centre of Excellence, a joint initiative between the Government of Telangana and DSCI, seeks to promote innovation, entrepreneurship, and capability building in the fields of cybersecurity and privacy. By providing a platform for incubation and acceleration of security and privacy startups, CCoE aims to establish Telangana as a hub for cybersecurity excellence.

Cyber Security Grand Challenge: To encourage a culture of innovation and entrepreneurship in the cybersecurity domain, MeitY and DSCI launched the Cyber Security Grand Challenge, a competition that offers a prize of INR 3.2 Crore to motivate startups to develop innovative cybersecurity solutions. The winners of the first grand challenge, SecurelyShare, Payatu, and Monoxor, have set a precedent for future participants.

UCCH Initiative: The UCCH initiative, a collaborative effort between DSCI and MeitY, aims to promote a culture of innovation by identifying niche use-cases and conducting application challenges. This initiative provides a platform for startups and entrepreneurs to showcase their innovative solutions and products.

Government E-Marketplace (GeM): The Government E-Marketplace, an initiative of the Indian government, provides a platform for startups to showcase their innovative products and services to government buyers and engage in public procurement. GeM also offers preferential market access to Indian startups and product companies, boosting the Make in India initiative. Additionally, GeM's Startup Runway 2.0 provides an opportunity for startups to demonstrate their innovative products and services.

Funding Programs: The Technology Development Board of DST, along with other ecosystem stakeholders, offers commercialization funding programs to support the growth of startups. These funding initiatives provide the necessary financial support for startups to develop and commercialize their innovative cybersecurity products and services, driving their growth and success.

Key risks and challenges to the industry

Parameter	Description
Talent Shortage	The Indian cybersecurity industry is facing a significant shortage of skilled cybersecurity talent. This shortage is making it challenging for service providers to expand their workforce and take on new projects, ultimately affecting the delivery of cybersecurity services. The lack of skilled professionals is also leading to increased competition for available talent, driving up salaries and costs for companies
High Employee Attrition Rates	Indian technology companies are struggling with high attrition rates, particularly among professionals with strong experience and expertise in digital technologies. The average attrition rate in the Indian IT industry is around 20-25%, with some companies experiencing rates as high as 30-40%. This high turnover rate is not only costly but also leads to a loss of knowledge, expertise, and intellectual property, ultimately affecting the quality of cybersecurity services.
Complex IT Infrastructure	The complexity of IT infrastructure is making it challenging for businesses to navigate numerous options from various OEMs, ensure compatibility with existing infrastructure, and integrate new solutions. This complexity is consuming additional IT resources and skills, leading to increased costs and decreased efficiency. Moreover, the lack of standardization and interoperability between different systems and technologies is creating security vulnerabilities, making it easier for attackers to exploit

Parameter	Description
<p>Rapid Technology Advancements</p>	<p>The rapid pace of technological advancements is creating challenges for cybersecurity professionals to keep up with the latest threats and technologies. New technologies such as cloud computing, artificial intelligence, and the Internet of Things (IoT) are introducing new security risks and vulnerabilities, making it difficult for organizations to stay ahead of cyber threats. The constant evolution of threats and technologies is requiring cybersecurity professionals to continuously update their skills and knowledge, which can be a significant challenge.</p>
<p>Limited Budgets and Resources</p>	<p>Many organizations in India have limited budgets and resources, making it challenging to invest in cybersecurity measures, such as training, technology, and personnel. The lack of investment in cybersecurity is leaving organizations vulnerable to cyber threats, with many not having the necessary resources to detect and respond to incidents effectively. Moreover, the limited budgets and resources are also affecting the ability of organizations to implement robust security controls, conduct regular security audits, and maintain incident response plans.</p>

Source: *Crisil Intelligence*

3. Assessment of Data Centre and Cloud services Industry

Cloud services segment overview

Cloud services refer to the delivery of on-demand computing services over the internet as well as intranet, enabling users to access and utilize a wide range of resources and applications. Data center's core design is based on a network of computing and storage resources that enable the delivery of shared applications and data.

Data center design includes routers, switches, firewalls, storage systems, servers, operating systems, networks and application delivery controllers. Because these components store and manage business-critical data and applications, data center security is critical in data center design. Together, they provide:

- **Network infrastructure.** This connects servers (physical and virtualized), data center services, storage, and external connectivity to end-user locations
- **Storage infrastructure.** Data is the fuel of the modern data center. Storage systems are used to hold this valuable commodity
- **Computing resources.** Applications are the engines of a data center. These servers provide the processing, memory, local storage, and network connectivity that drive applications

To provide cloud services, the infrastructure should support the center's hardware and software. These include power subsystems, uninterruptible power supplies (UPS), ventilation, cooling systems, fire suppression, backup generators, and connections to external networks.

Based on type of deployment, the cloud industry can be broadly bifurcated as follows:

1. Private Cloud
2. Public Cloud
3. Hybrid Cloud
4. Multi Cloud
5. Hybrid-multi-Cloud

Private cloud is a virtualised environment which is owned and operated by companies for internal usage. It is accessed through internal private network and used only by the authorised personnel. Private cloud infrastructure would include both on-premises data centres as well as virtualised data centres.

Public cloud is also a virtualised environment that uses standard cloud computing model to make resources and services available to organisations using the public internet. In contrast to a private cloud, a public cloud offers its services not only to individual organisations, but to other users as well via the public internet. It permits scalability and resource sharing that would not otherwise be possible for a single organisation to achieve.

Hybrid cloud as the name suggests is a mixed computing environment that runs on both private and public cloud. Hybrid cloud allows one to migrate and manage workloads between various environments based on specific business needs of the organisation.

Multi cloud is where an organisation uses the cloud computing environment of two or more vendors together. In other words, instead of using single cloud environment the multi cloud tries to use a combination of two or more public cloud, two or private cloud. This provides organisations an advantage for creating strategies that involves multiple cloud environments to suit the business needs.

Hybrid multi cloud differentiates from multi cloud is when an organisation uses multiple cloud environments but has combination of both private and public clouds.

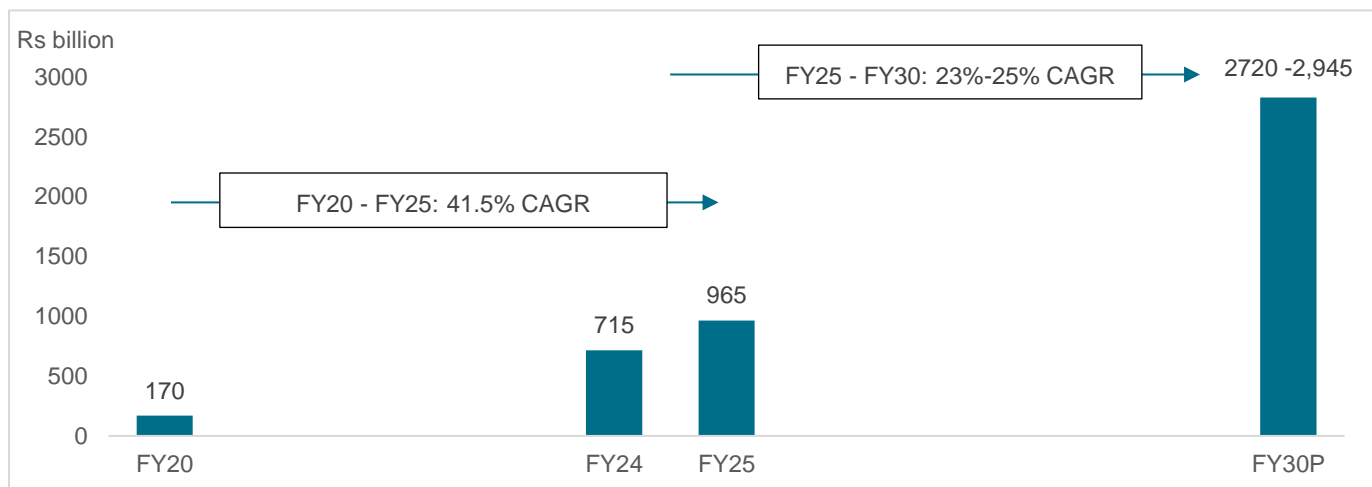
Indian cloud services industry

Indian cloud service industry dominated by private cloud environment

Similar to that of global trends, the Indian cloud services industry is majorly dominated by the private cloud environment. However, the trend is changing with increase in adoption of public cloud given its low upfront and ownership costs thus reducing the overall operational costs for the company. In terms of adoption of public cloud, small enterprises lead the way when compared to that of large and medium enterprises given its lower operational costs when compared to other deployment models. Large enterprises adoption remains low given their existing on-premises data centres. Instead, they're adapting the hybrid environment to as benefit from the advantages of public cloud.

As of fiscal 2020, the public cloud market is valued at ₹ 170 billion which has grown at a CAGR of 42% reaching ₹ 965 billion by fiscal 2025. This growth is majorly driven by accelerated adoption of digital services across sectors after Covid-19 pandemic. Further, the pandemic revealed the underlying advantage of public model environment being more scalable and flexible when compared to other models, which played a vital role in increasing its adoption during the mentioned period. Going forward, initiatives and support from Government of India coupled with growing internet penetration is likely to speed up the adoption of cloud services and new technologies. Crisil Intelligence projects the Indian Public Cloud market to grow at CAGR of 23-25% reaching ₹ 2,720 – ₹ 2,945 billion by fiscal 2030.

Assessment of public cloud services industry in India



E: Estimates, P: Projected, Source: Crisil Intelligence

Key growth drivers and trends in global cloud services industry

Parameters	Description
Legacy applications act as a hinderance in digital transformation	Over the years, cloud services have gained traction due to their ability to transform enterprises in adapting modern technologies. Though the new applications can reap full range of cloud services, legacy applications find limitations in doing the same. However, organizations will continue to look to modernize applications to keep IT transformation on track.
Cloud cost management to gain more traction	In recent times, on-demand pricing model of cloud has become popular in spite of being expensive highlighting companies favoring commitment less consumption of cloud services. Given this scenario, going forward, with increase in usage of cloud, cloud cost management will also play a crucial in cloud adoption.
Industry specific and government cloud gain momentum	Cloud is a priority for organizations across sectors, but adoption of cloud may vary from sector to sector. But technology upgradation in cloud services hardware vendors, hyper scalers are ready with solutions to adapt to sudden requirements and aid firms in their digital transformation. This bolsters the momentum of firms from across the sectors along with government organizations favoring cloud adoption.
Sustainability led approach to gain momentum in cloud service industry	The cloud services industry is one of the top consumers of electricity. With increasing recognition towards importance of environmental, social and governance (ESG) factors, cloud service providers are also targeting to achieve zero carbon footprint by utilizing 100% renewable source of energy
Global expansion of businesses	As businesses start expanding their operations globally, they rely on cloud services to provide consistent and reliable access to applications and data for employees and customers worldwide. The cloud's geographic reach and availability zones enable companies to expand operations in a seamless manner.
Increasing adoption of remote work culture	The rapid expansion of remote work, accelerated by the COVID-19 pandemic, has driven increased demand for cloud-based collaboration and communication tools. Cloud services facilitate remote work by enabling employees to access data and applications from anywhere, fostering the need for cloud infrastructure and software solutions.

Parameters	Description
<p>Focus on sustainability leading to public cloud adoption</p>	<p>Over the last decade, enterprises across the globe have recognized the importance of environmental, social and governance (ESG) factors in the context of corporate responsibility. As top power/energy consumers, cloud technology providers have made strong commitments to become 100% powered by renewable energy and advance toward net-zero carbon footprints. Increasing focus on sustainability by cloud service providers vis-à-vis traditional corporate datacenter-centric on-premises IT will become an increasingly prominent selling point for the cloud service providers.</p>

Source: Crisil Intelligence

Data centre industry overview

Modern data centers have evolved from their traditional physical infrastructure approach. Infrastructure has shifted from traditional on-premises physical servers to virtual networks that support applications and workloads across pools of physical infrastructure and into a multicloud environment. Today, data exists and is connected across multiple data centers, and public and private clouds. The data center must be able to communicate across these multiple sites, across both on-premises and cloud. Even the public cloud is a collection of data centers situated at some location. When applications are hosted in the cloud, they are using data center resources from the cloud provider.

The migration from an on-premises data center to a cloud data center doesn't mean moving everything to the cloud. Many companies have hybrid cloud data centers which have a mix of on-premises data center components and virtual data centers components. Depending on the model selected, an organization may be responsible for maintaining and securing more or less of their infrastructure stack. Data centre industry based on shared responsibility can be bifurcated as follows:

1. On-premises IT
2. Co-location
3. Hosting
4. Infrastructure as a service (IaaS)
5. Software as a service (SaaS)
6. Platform as a service (PaaS)

On-premises IT services are accessed and used by the internal personnel only. As the names suggests these services are processed on-premises providing an advantage in terms of control over the data stored. These are built, owned, and operated by companies and are optimized for their end users.

Colocation is a service where the company rents space in the data centres owned by a third party and is off premises for the company. In this the third party provides services such as building, cooling systems and the company manages servers, storage, firewall and rest of the components

Hosting is a service where the third party owns the servers, storage, networks and data centres while rest of the components are managed by the company itself. These data centers are managed by a third party (or a managed services provider) on behalf of a company. The company leases the equipment and infrastructure instead of buying it.

Cloud data centre is an off-premises form of data center where data and applications are hosted by a cloud services provider such as Amazon Web Services (AWS), Microsoft (Azure), or IBM Cloud or other public cloud provider. Cloud service provides their services primarily based on three standard service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS)

- **IaaS**, also known as Hardware as a Service (HaaS), is a service where the infrastructure components such as virtual machines, data centre, storage and network are owned by the third party and provided as service to the business entities. The business entity manages what they have on cloud such as data, applications, operating systems and databases
- **SaaS** is a service where the company manages the data and applications that are being stored on cloud by while rest of hardware and software is provided by the third party. In SaaS, the end consumer who is availing the service has control over the infrastructure such as data centres, servers, storage provided by the third party. Further in SaaS, while on the front-end cloud technology is used in providing the service, in the back-end data centre infrastructure is being utilised for providing the cloud service.
- **PaaS** is a service where third party manages all the software and hardware while the company is managing data. Similar to that of SaaS, in PaaS as well, the end consumer who is availing the service has no control over the infrastructure such as data centres, servers, storage provided by the third party. The front-end cloud technology is used in providing the PaaS , in the back-end data centre infrastructure is being utilised for providing the cloud service by some data center provider.

Cloud Computing Service Models: Responsibilities Matrix

On-premises	Co-location	Hosting	IaaS	PaaS	SaaS
Data	Data	Data	Data	Data	Data
Applications	Applications	Applications	Applications	Applications	Applications
Databases	Databases	Databases	Databases	Databases	Databases
Operating Systems	Operating Systems	Operating Systems	Operating Systems	Operating Systems	Operating Systems
Network security and configuration	Network security and configuration	Network security and configuration	Network security and configuration	Network security and configuration	Network security and configuration
Virtualisation	Virtualisation	Virtualisation	Virtualisation	Virtualisation	Virtualisation
Physical Servers	Physical Servers	Physical Servers	Physical Servers	Physical Servers	Physical Servers
Storage	Storage	Storage	Storage	Storage	Storage
Network	Network	Network	Network	Network	Network
Data centers	Physical access to Data centers	Physical access to Data centers	Physical access to Data centers	Physical access to Data centers	Physical access to Data centers

Managed by customer

Managed by one or multiple service providers

Source: Industry sources, Crisil Intelligence

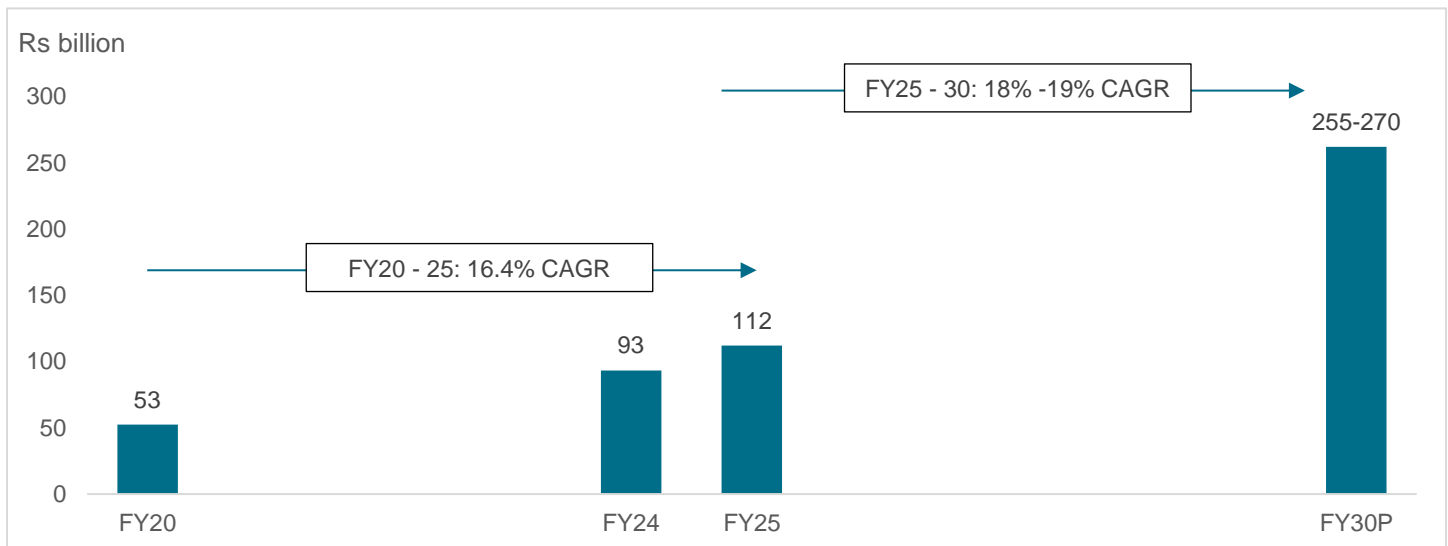
Overview of India data centre industry

From fiscal 2020 to fiscal 2025, the Indian data centre industry has seen a growth at CAGR of ~16.4%. This growth can be attributed to factors such as growth in internet accessibility, surge in e-commerce adoption, rise in digital adoption due government initiatives such as UPI and e-governance. Further, with the increasing number of organisations adopting cloud infrastructure as a means of reducing their expenses has catered to demand growth of data centres during the aforementioned period.

Going forward, the industry is expected to see a CAGR of 18%-19% between fiscal 2025 and 2030, reaching ₹ 255 – 270 billion by the end. The growth is enabled by increasing consumption of data, 5G rollouts across India as well as advanced in technologies such as IoT, Big data, Artificial intelligence and Machine Learning. In addition to thrust from government through initiatives such as data protection bill 2023, draft data centre policy, infrastructure status for data centre also drive the growth.

Recently, various government organisations have brought in regulations aiding data localisation, these include RBI mandating data regarding payment transactions and KYC to be stored in India, SEBI mandating all its regulated entities to store their data in India. Further adoption of localisation by government and private entities would bolster the growth in industry.

Data Centre industry in India



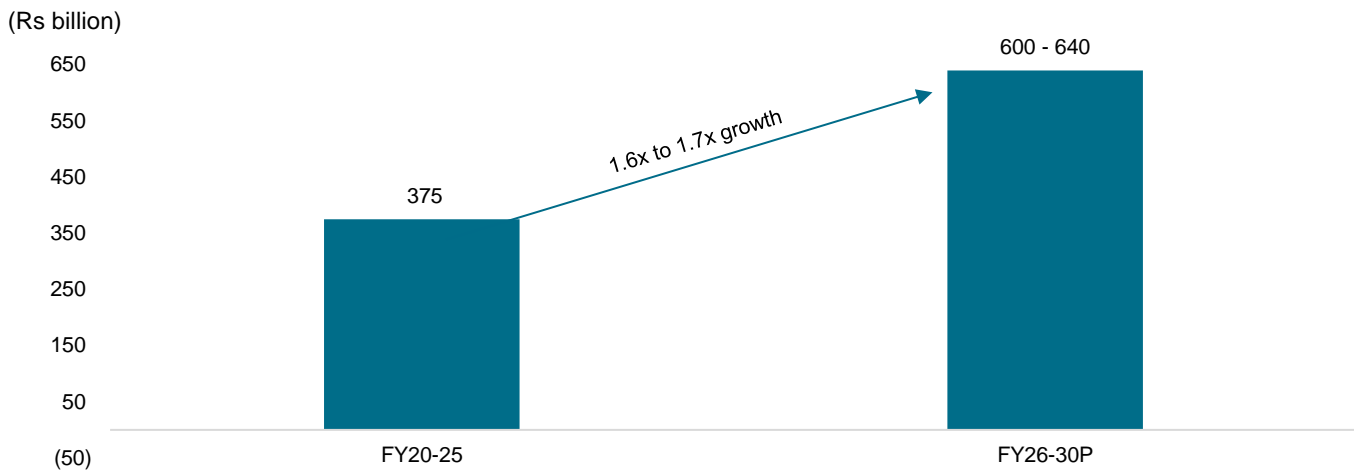
Notes: E: Estimates, P: Projected,

Source: Crisil Intelligence

Overview of data centre construction — Mechanical, Electrical and Plumbing (MEP)

The demand for data centres across the globe is driven by the emergence of AI and ML and the growing digital economy's demands for data-intensive applications, IoT applications, online streaming, gaming, remote work etc. Globally and in India, the industry is expected to clock 1.6x to 1.7x growth in capex between fiscals 2025 and 2030 towards the mechanical, electrical and plumbing (MEP) components which include power set-up, cooling units, fibre connectivity, racks etc.

Projected data centre construction — MEP capex (including fibre optic connectivity)



Notes:

The above figure includes only the capex towards new data centre construction

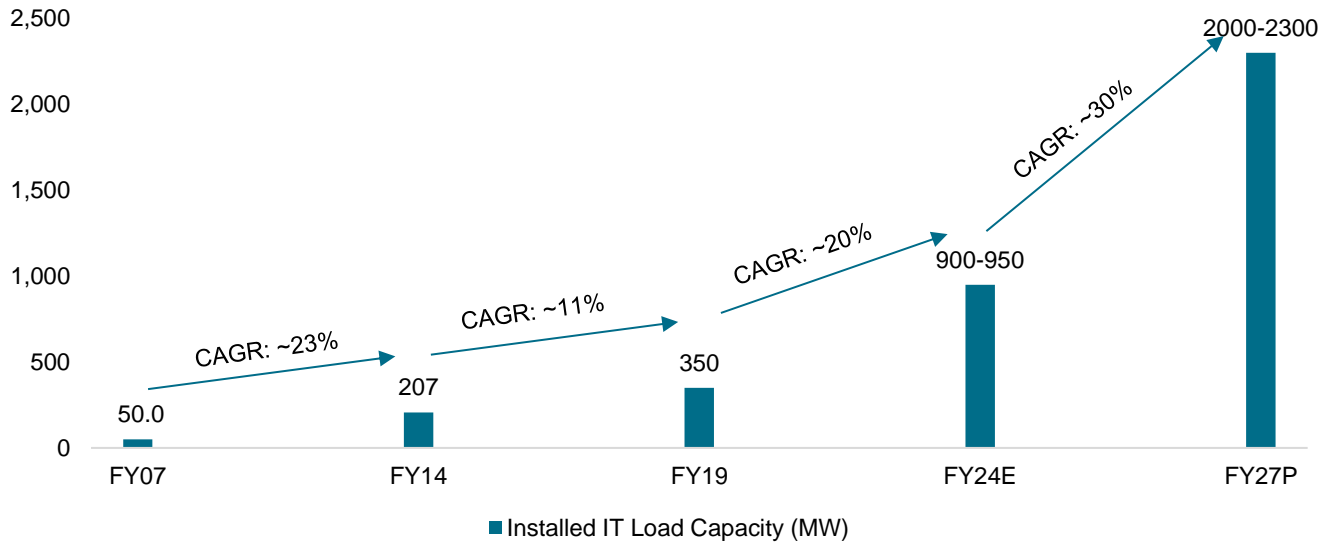
MEP: power set-up, cooling units, fibre connectivity, racks etc.

Source: Industry, Crisil Intelligence

India installed capacity to cross 2 GW by fiscal 2027

The Indian data centre market has experienced significant growth and transformation in recent years. The key factors that contribute to the dynamism and potential of the market are the Digital India initiative, data localisation regulation and rapid growth in data consumption. The increasing global investment and rise of colocation and edge computing have also boosted the overall growth of data centre market in India. Data centre capacity in the country has grown from 350 MW in fiscal 2019 to 900-950 MW in fiscal 2024 and expected to reach to 2000-2300 MW by fiscal 2027

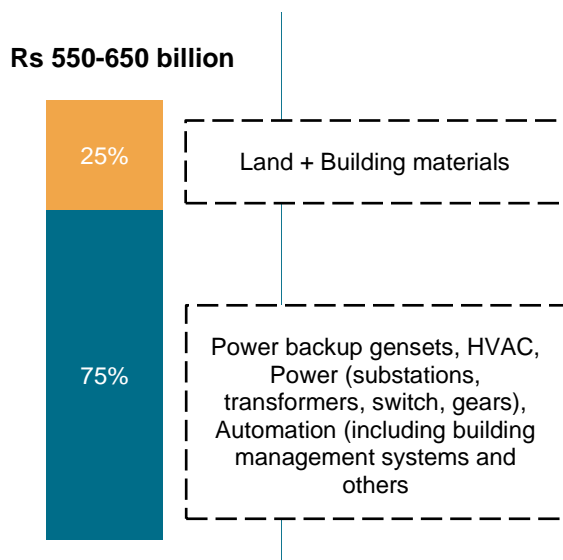
Data Centre capacity in India (fiscal 2007-27P)



Source: Industry, CRISIL MI&A; Note: E – Estimated P – Projected

India's data centre capacity is on a remarkable growth trajectory. This explosive growth was driven by a powerful trifecta of factors: i) the data boom fuelled by the proliferation of digital services and the widespread adoption of technology creating an insatiable demand for data storage and processing capabilities; ii) 5G user base to reach over 350 million by FY26 and GenAI, IOT, big data to drive further growth; iii) government regulations mandating data localisation (the storage of sensitive data within the country). The regulations align with the government's broader digital initiatives that seek to ensure data sovereignty. Collectively, these dynamics position India as a key player in the global data centre landscape.

Industry to see a capex investment of ₹ 550-650 billion over fiscal 2025-27



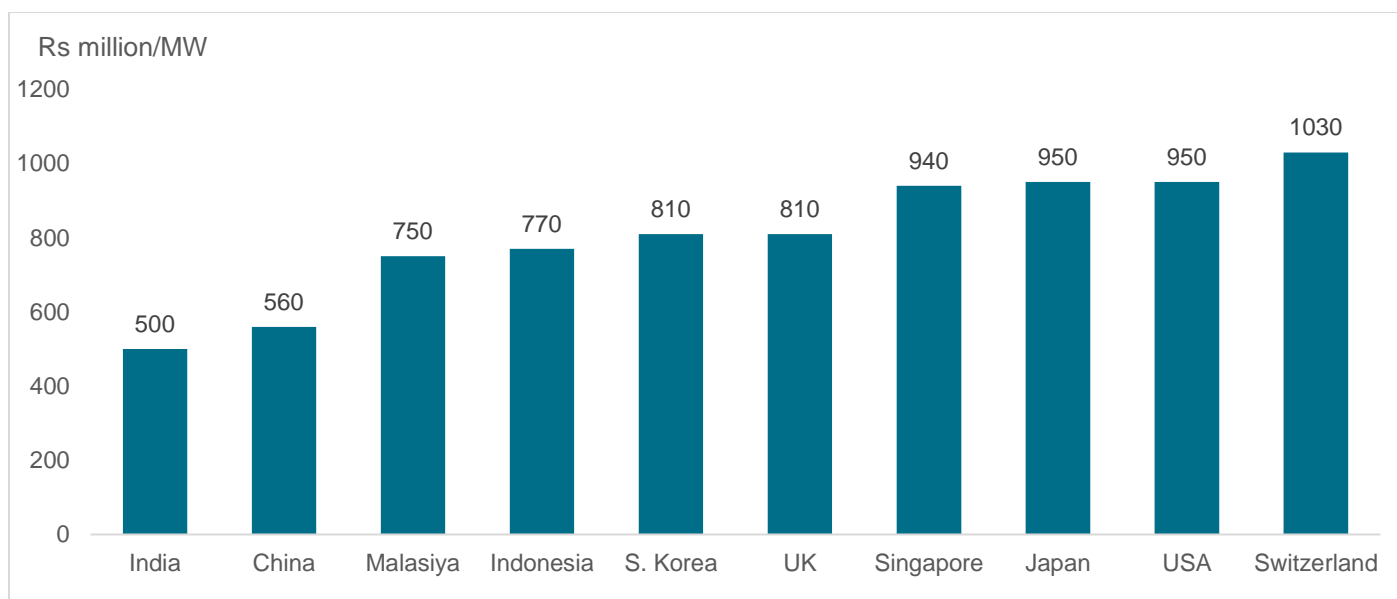
- CRISIL estimates data centre industry to see a capex of ~Rs 550-650 billion between fiscals 2025 and 2027
- The capex is led by the lower real estate costs and availability of skilled manpower in comparison to countries making India a cost-effective region for construction of data centres.
- Further, players are investing upfront capex such as land, building and common mechanical, electrical and plumbing (MEP) activities to demonstrate their expertise which further indicates the future growth in the industry

Source: Industry, company reports, Crisil Intelligence

Increasingly, investments in the data centre sector are tied to contractual agreements, providing greater predictability. Industry players are strategically investing upfront in land, construction and shared MEP infrastructure to showcase their expertise and ensure readiness.

Remarkably, nearly half of the capex is expected to be dedicated to modular components, allowing customisation according to customers' specific MEP requirements. This approach optimises resource allocation and aligns with the flexibility demanded by diverse clients in the ever-evolving data centre landscape. It indicates that as a dynamic industry, the data centre operations are adapting to customer needs and also maintaining cost-efficiency and expertise.

Lower real estate cost and availability of skilled manpower make India a cost-effective market



Source: Industry, CRISIL MI&A

India stands out as a cost-effective market for data centre as the cost for creating per MW of capacity in the country stands at Rs 500 million, lower than many other countries. The reasons for the lower cost are the affordable rates of real estate in the country and the presence of a skilled workforce. In contrast, countries such as Switzerland, the USA and Japan have considerably higher construction costs per MW, ranging from Rs 950 million to Rs 1,030 million.

Overall, India has a competitive edge in the data centre industry. For businesses, establishing or expanding their data infrastructure in India will be economical as they will be able to maintain cost-efficiency.

Investments announced in the industry

The data centre industry in India has been experiencing a traction for investments in recent years, propelled by the country's growing digital economy, increasing internet penetration, and the government's push for digital transformation initiatives. The industry is seeing investments from real estate players, global PE funds, domestic and global data centre operators. India's vast population and the rising demand for digital services have made India an attractive market for data centre infrastructure development. Recent announcements made in the industry are as follows

Sl no	Companies involved	Description
1	Amazon Web Services	Amazon Web Services announced its plans to invest \$12.7 billion in Indian cloud infrastructure by 2030. In addition to this it has also planned to make a total investment of ₹ 363 billion to set up six data centres over the next decade
2	Reliance	Reliance industries entered into agreement Brookfield Infrastructure and Digital Realty in a plan to develop data centers in key locations of Mumbai and Chennai. The alliance announced the acquisition of land in Mumbai to build a 40MW data center
3	AdaniConneX	AdaniConneX (a Joint enterprise between Adani Enterprises and EdgeConneX) has raised \$213 million to finance its under construction data centers in Noida and Chennai
4	Web Werks and Iron Mountain	The joint venture between Web Werks and Iron Mountain is planning to invest ₹ 14,000 million to develop a data center in Navi Mumbai
5	Blackstone	Through its data center platform Lumina CloudInfra, Blackstone's Real estate and Tactical Opportunities Fund is planning to invest around \$300 million in developing a data center campus in Navi Mumbai
8	Digital Edge	Singapore-based data center platform Digital Edge is foraying into India by acquiring 47-acre land along with realty developer Assetz Property Group
9	Anant Raj	The real estate company plans to ₹ 100 billion in developing data centres with a capacity of 300 MW over the next four to five years.

Source: Crisil Intelligence

Growth drivers and trends in the Indian data centre industry

Parameters	Overview
Government Initiatives	<p>Recognising the importance of data centres in driving the growth towards digital economy, the Indian government has brought in several measures to aid the establishment and expansion of data centres across the country. Key measures such as</p> <ul style="list-style-type: none"> • Inclusion of data centres into harmonised list of infrastructure to aid the industry in availing long-term credit from domestic and international lenders at concessional rates and help in boosting the investments in the industry • Introducing Digital Personal Data Protection Bill (2023) under which personal data collected online or collected offline and digitalised should be processed within India was major focus among others • Introduction of draft Data Centre Policy (2020), with focus on various aspects such as declaration of data centres as essential services, recognition of data centres as separate category under National Building Code and setting up of data centre economic zones • Promotion of digital India campaign focusing on improving digital penetration, e-governance and digital manufacturing in the country

Parameters	Overview
	<ul style="list-style-type: none"> • Skill development programs such as DESH for developing an efficient and skilled workforce <p>Among the above mentioned, initiatives such as digital personal data protection bill and digital India campaign would also drive the demand for cloud services in India.</p>
Increasing adoption of cloud services	<p>The increasing adoption of cloud services allow companies to eliminate upfront capital infrastructure costs, thereby increasing their accessibility of IT services to small and medium sized organisations, as well as startups. Moreover, by reducing the need for extensive on-site hardware, these models are fuelling the demand for data centre services. Further, businesses are continually seeking agile, cost-efficient solutions to meet their IT requirements through the adoption of cloud models, which will further drive the expansion of data centres.</p>
Adoption of new technology-based solutions	<p>Firms are consistently incorporating modern technologies into their operations to meet the growing need for IT and related services. As enterprises embrace digital transformation, the infusion of advanced tools like AI, IoT, Big Data analysis, and Machine Learning into their processes requires robust and scalable IT systems, leading to a surge in data centre demand. Moreover, the adoption of technologies like 5G accentuates the importance of low latency and swift data access, further driving the requirement for more data centres as well as cloud services.</p>
Rise in internet penetration	<p>With the drastic fall of internet prices coupled with improved infrastructure internet penetration in India has increased from 25.15 crore in fiscal 2014 to 96.96 crore till July 2024. Similarly, internet subscribers have grown at a CAGR of 285.53% between fiscal 2014 and 2024. The smartphone penetration has also seen a raise from 38% of overall phones in fiscal 2018 to 63% in fiscal 2023. This coupled with data localisation proposed under Digital Personal Data Protection Bill (2023) would aid the growth of data centres and cloud services in India.</p>
Business transformation	<p>As companies across sectors race to modernize their operations, adopt digital technologies, and harness the potential of cloud computing the need to accommodate vast amounts of data, ensure seamless connectivity, and facilitate advanced analytics also increase. This in turn creates a demand for robust, scalable, and efficient data centre infrastructure thus aiding the industry growth</p>
Workplace productivity	<p>The widespread adoption of cloud technology has played crucial role in enhancing workplace productivity. By harnessing the capabilities of the cloud, organisations can streamline operations, optimise resource allocation, and facilitate seamless collaboration among teams, regardless of the geographical constraints. As businesses continue to rely on cloud-based solutions for enabling remote work, real-time data access, and scalable infrastructure, the data centre industry is expected to see further demand as data centres form major part in accommodating the storage, processing, and managing volumes of digital information. This would also aid in demand creation for cloud services industry.</p>

Source: Crisil Intelligence

Key challenges in the Indian data centre industry

Parameters	Overview
Speculative Capacity	The data centre industry in India is witnessing a surge in investments, leading to an increase in speculative capacity. This means that many data centres are being built without confirmed demand, resulting in unused capacities. This can lead to a cash flow mismatch, as the revenue generated from these unused capacities may not be sufficient to cover the operational expenses, including power consumption, maintenance, and staffing. The increasing competition in the sector will further exacerbate this issue, making it challenging for data centre operators to maintain profitability.
Pricing Risks	The data centre industry in India is highly competitive, which can lead to pricing pressure, especially during contract renewals. Data centre operators may be forced to reduce their prices to retain customers, which can impact their revenue and profitability. Moreover, migrating to a different data centre is a complex and time-consuming process, making it difficult for customers to switch providers. Therefore, data centre operators must remain competitive in terms of pricing to retain their customer base.
Import Dependence	The data centre industry in India is heavily dependent on imported equipment, including servers, storage systems, and networking gear. The "Make in India" initiative aims to reduce this dependence on imported equipment and promote domestic manufacturing. While this is a positive development, it may take time to achieve significant reductions in import dependence, and data centre operators must continue to manage the risks associated with relying on imported equipment.
Technological Innovation and Security Risk	The data centre industry is rapidly evolving, with new technologies and innovations emerging regularly. While this presents opportunities for growth and improvement, it also poses risks, particularly with regards to data security. Data centre operators in India must ensure that they have high levels of data security in place to protect against cyber threats and data breaches. However, the rapid pace of technological change also means that equipment and systems can become obsolete quickly, making it essential for data centre operators to stay up-to-date with the latest technologies and innovations.
Regulatory Environment	The regulatory environment in India is currently favorable for the growth of the data centre industry, with various initiatives and policies aimed at promoting the sector. However, regulatory provisions related to sustainability, such as those pertaining to power consumption and environmental impact, may pose challenges for data centre operators in the future. Data centres consume significant amounts of power, which can contribute to environmental degradation and climate change. As regulatory scrutiny increases, data centre operators in India must ensure that they are compliant with relevant regulations and are taking steps to reduce their environmental impact.

Source: Crisil Intelligence

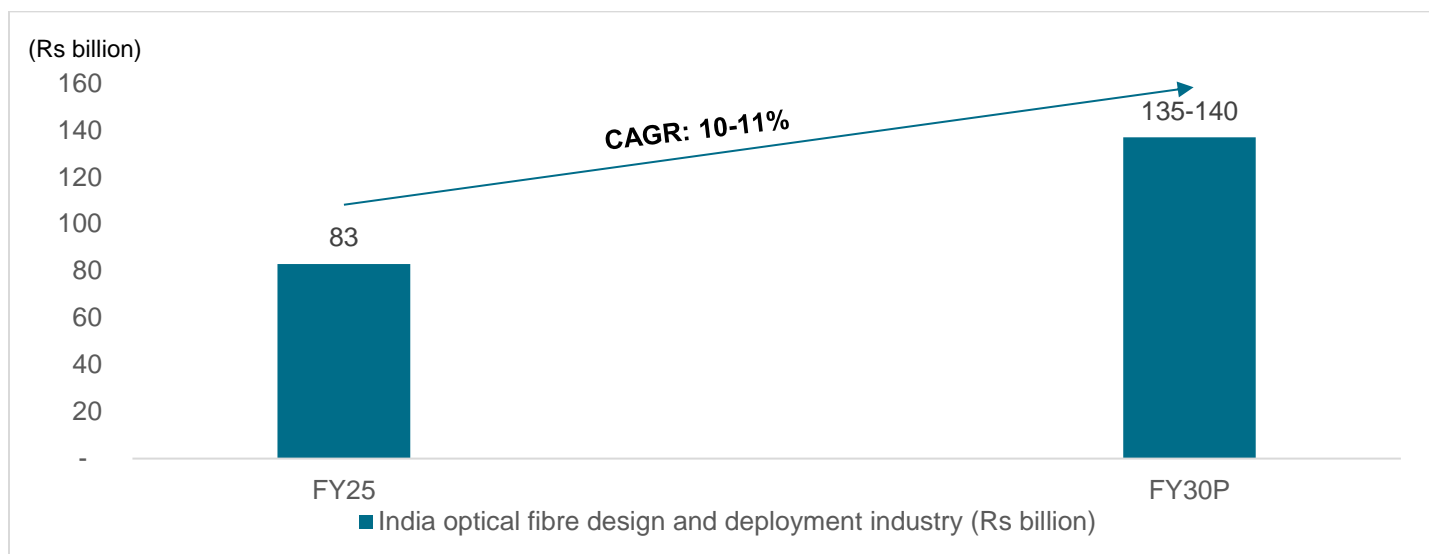
4. Assessment of optical fibre design and deployment industry in India

Overview of optical fibre design and deployment Industry in India

Optical fibre design and deployment industry in India projected to be Rs 135-140 billion by fiscal 2030

The Indian optical fibre design and deployment industry is defined according to the service offerings such as optical fibre laying and roll-out, network deployment, and system integration across end-use sectors such as telecommunications, defence, railways, smart cities, IT, and enterprises etc. The industry is estimated to be ~Rs 83 billion as of fiscal 2025. Going ahead, the industry is expected to grow to Rs 135-140 billion by fiscal 2030, clocking a CAGR of 10-11% over the period fiscal 2025-2030. The optical fibre network is the backbone of the burgeoning digital economy of India. The industry growth is supported by drivers such as digital transformation across sectors, growing 5G coverage and infrastructure, FTTH, government schemes and policies (BharatNet, Digital India, Smart Cities, Fiberisation targets etc), systems and network modernisation across sectors such as defence, railways etc.

Optical fibre design and deployment industry in India



Note: The above industry size includes the optical fibre design and deployment projects implemented by 3rd party service providers and excludes optical fibre network deployment by an entity through its group companies

Source: Industry, Crisil Intelligence; Note: E – Estimated P – Projected

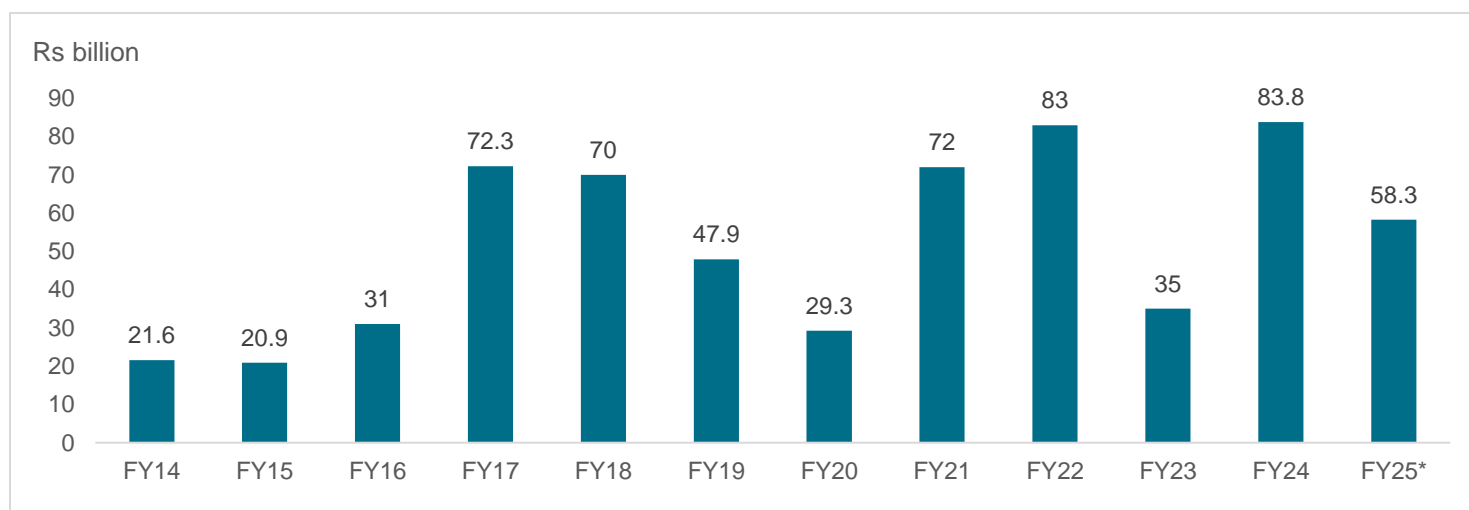
Government schemes and regulations to strongly support optical fibre design and deployment industry growth

Capital allocation to USOF and DoT projects to aid growth

The industry's growth is aided by government investments in the telecommunications sector. Between fiscals 2017 and 2024, the budget allocation towards the Department of Telecommunications (DoT) logged a CAGR of 22.3%, led by higher allocation towards the Universal Service Obligation Fund (USOF) and DoT projects, including towards the domestic industry incentivisation schemes (such as PLI) and wireless planning and coordination. For fiscal 2024, Rs 975.8 billion was allocated to the telecommunication ministry, which is ~2% of the overall budget and up 19% on-year. Of this, Rs 530.0 billion was infused in BSNL.

The USOF fund was started by the Government of India in 2003 to provide telecom services (including mobile services, broadband connectivity and information and communication technology (ICT) infrastructure creation, added in 2006) for rural and remote areas. Under the fund, some projects are allotted to various mobile service providers to facilitate mobile network, especially in rural and remote areas.

USOF funds disbursal



Note: * as on September 31, 2024

Source: Universal Service Obligation Fund, Department of Telecommunications, Ministry of Communications, Government of India, Crisil Intelligence

Additionally, allocation towards the Digital India programme, which includes electronic governance, capacity building and skill development, manpower development, promotion of electronics and IT hardware manufacturing and promotion of digital payments, among others, has seen a cumulative investment of ~Rs 290 billion since fiscal 2017, with ~Rs 48 billion budgeted for fiscal 2024.

NHAI's Digital Highways presents major opportunities for the industry

The National Highway Authority of India aims to develop ~10,000 km of OFC infrastructure across the country by fiscal 2025. The implementation of the OFC network and Digital Highways will be done by developing integrated utility corridors along the national highways. For the development of Digital Highway, a stretch of ~1,367 km along the Delhi-Mumbai Expressway and 512 km along the Hyderabad-Bangalore Corridor has been identified as pilot routes. A three-metre-wide dedicated utility corridor utilised to lay OFC is part of the 246 km-long Delhi-Dausa-Lalsot section of the Delhi-Mumbai Expressway. The network will aid the provision of internet connectivity to remote areas and new telecom technologies such as 5G and 6G. The network will be leased out on a fixed-price allotment mechanism on an 'open for all' basis through a

web portal to eligible users. The OFC allotment policy is being finalised in consultation with DoT and the Telecom Regulatory Authority of India (TRAI).

BharaNet scheme to significantly boost optical fibre connectivity across Indian villages

The government is implementing the BharatNet project hailed as one of the biggest rural telecom projects globally. It is scheduled to be implemented in a phased manner in all the gram panchayats (~0.25 million) in the country for access to broadband connectivity to all the telecom service providers. The total funding of the scheme (phase-I approved in 2011 and phase-II in 2017), is Rs 420.68 billion (exclusive of goods and services taxes, octroi and local taxes). As on 31st December 2023, a total of Rs. 398.25 billion has been disbursed under BharatNet Project since inception of the project.

So far, 214,323 gram panchayats are connected through the BharatNet project and 6.9 lakh km of OFC has been laid. Additionally, 12,63,947 FTTH connections have been commissioned and 104,574 Wi-Fi hotspots installed to ensure last-mile connectivity as on December 20, 2024.

In February 2024, BSNL rolled out a tender worth Rs 650 billion for phase-III, which represents a major opportunity for domestic optical networking product suppliers such as Sterlite Technologies, HFCL, Birla Cable, Vindhya Telelinks and more.

National Broadband Mission targets 70% fiberisation in India's telecom industry by fiscal 2025

By fiscal 2025, the National Broadband Mission targets to fiberise 70% of India's base transceiver station (BTS), ideal for the efficient rollout of 5G services. However, with fiberisation at 35.11% in India as of June 2022, ~0.3 million km must be covered nationally in fiscals 2024 and 2025. To achieve the remaining target, telecom operators will have to spend Rs 1,250 billion and on incremental BTS for 5G. The total length of optical fibre laid as on June 30, 2023, was 3,726,577 km, compared with 2,812,627 km as of end-September 2022. The government envisages fiberisation to be increased up to 5 million km by fiscal 2025, while targeting 1.5 million tower fiberisation.

As of July 2022, the OFC network of ~1 million route kms laid by public sector undertakings BSNL, Bharat Broadband Nigam Ltd (BBNL), RailTel Corporation of India Ltd, Mahanagar Telephone Nigam Ltd (MTNL), GAIL (India) Ltd, and ~5,73,000 telecom towers installed by telecom service providers (TSPs) were mapped on the PM GatiShakti National Master Plan portal.

Strong government support to BSNL

As part of its commitment towards enhancing the services in the telecom sector, the government has from time-to-time infused capital into BSNL for it to remain relevant against private competitors for implementing the latest technologies. In 2019, the government approved the first revival package for BSNL/MTNL worth Rs 690 billion. In 2022, with the approval of the second revival package of Rs 1.64 trillion, state-run entities gained financial support for capex, viability gap funding for rural landlines, financial support for de-stressing the balance sheet and settlement of adjusted gross revenue dues and merger of BBNL with BSNL. In June 2023, the third revival package for BSNL with the total outlay of Rs 890.47 billion was approved. The total home fibre subscriber base of BSNL in Dec 2024 is 35.33 lakh.

Amendments to the Right of Way Rules and GatiShakti Sanchar portal for faster 5G rollout and fiberisation

In August 2022, the government released amendments in the Indian Telegraph Right of Way (RoW) Rules, 2016 to facilitate faster and easier deployment of telecom infrastructure. The average time for approval of RoW applications reduced from 435 days in 2019 to 16 days in July 2022. In addition, certain revisions to the processing fees were part of these amendments. The administrative fee for laying overground optical fibre was limited to Rs 1,000/ km. As per the amendments, the street infrastructure may be utilised at a nominal cost of Rs 100/annum to install overground optical fibre. Further, if the telecom licensee is laying cables using horizontal directional digging technology and not digging a full trench, then restoration charges apply only for the pits and not for the entire route.

The government has launched the GatiShakti Sanchar portal for the Centralised RoW approvals. The portal is now functional with all 36 states/UTs onboard and integrated with the Ministry of Railways, Ministry of Road Transport and Highways and Ministry of Defence-Director General of Military Operations. The portal acts as a common single point for RoW permissions to lay down OFC and erecting mobile towers to be used by TSPs as well as infrastructure providers to aid faster infrastructure development, which will enable quicker 5G deployment.

Government is provided public Wi-Fi service through the PM-WANI scheme

To expedite the expansion of broadband internet services, the government introduced the Prime Minister Wi-Fi Access Network Interface (PM-WANI) in 2020. The public Wi-Fi service is available across the nation through public data offices and has 182,034 Wi-Fi hotspots, including 100 train stations spanning 22 states. In August 2022, the government introduced a 5-P model (people-panchayat-public-private-partnership) to broaden the reach of the PM-WANI scheme, extending its coverage to rural areas and hinterlands of the country. This model emphasises on collaboration between people, local governance bodies (panchayats), the public and private entities to facilitate the implementation and success of the PM-WANI initiative in remote and rural regions.

Key trends and drivers of the optical fibre design and deployment industry

Parameter	Description
Increasing demand for bandwidth	The growing demand for high-speed internet, driven by applications like video streaming, cloud computing and 5G networks has led to a significant increase in the demand for optical fibre infrastructure.
5G deployment	The rollout of 5G networks requires robust and high-capacity optical fibre networks to support the increased data traffic, low latency requirements and connectivity demands of 5G technology.
Data centre connectivity	The expansion of data centres and the adoption of cloud services have driven the need for high-speed, reliable and low-latency connectivity solutions, making optical fibre infrastructure essential.
FTTH deployment	The push for broadband connectivity directly to residences and businesses is driving the deployment of FTTH networks. Governments and service providers are investing in optical fibre to enhance internet access and speeds.
Smart cities and IoT connectivity	The development of smart cities and the increasing number of Internet of Things (IoT) devices are driving the demand for robust and scalable optical fibre networks to support the connectivity requirements of various smart applications.
Advancements in optical fibre technology	Ongoing advancements in optical fibre technology, such as higher data transmission speeds and improved efficiency, are influencing the design and deployment industry. These developments aim to enhance the overall performance and capacity of optical fibre networks.

Parameter	Description
Fiber optic network security	With the increasing reliance on optical fibre networks, there is a growing emphasis on implementing security measures to protect these networks from cyberthreats and ensure data integrity.
Global connectivity projects	Initiatives and projects focused on enhancing global connectivity, such as undersea cable systems, are driving the demand for optical fibre design and deployment services to lay and maintain the necessary infrastructure.

Source: Crisil Intelligence

Key risks and challenges the industry faces

The industry faces various risks and challenges that have an impact on its operations and growth. The following are some of key risks and challenges:

Parameter	Description
Regulatory and permitting challenges	Complex regulatory requirements and permitting processes can lead to delays and increased costs in project execution. Navigating through different regulations in various regions can be a significant challenge.
Cost overruns	Unforeseen construction challenges, changes in project scope, unavailability of right of way, and fluctuations in material or labour costs can lead to cost overruns, impacting project profitability.
Supply-chain disruptions	The optical fibre design and deployment industry is dependent on a global supply chain for equipment and materials. Disruptions such as shortages, transportation issues or geopolitical factors can impact the timely delivery of components.
Technological changes and obsolescence	Advancements in deployment technology can render existing techniques obsolete. Design and deployment companies need to adapt to new technologies and ensure that the deployed optical fibre networks remain competitive and meet evolving standards.
Cybersecurity risks	Optical fibre networks are vulnerable to cybersecurity threats. Ensuring the security of the networks against hacking, data breaches and other cyberthreats is a critical challenge for the industry.
Environmental impact and sustainability	Design and deployment companies may face challenges related to environmental regulations and sustainability concerns. Balancing the need for expanding networks with minimising environmental impact is a growing consideration.
Weather and natural disasters	Construction projects are susceptible to weather-related disruptions and natural disasters. Extreme weather conditions, such as hurricanes, earthquakes or floods, can cause delays and damage to infrastructure.
Quality control and performance assurance	Ensuring the quality and performance of the optical fibre networks is crucial. Issues related to network reliability, signal loss or other performance problems can lead to costly rework and damage the company's reputation.
Skilled-labour shortages	The optical fibre design and deployment industry requires skilled labour for design, installation and maintenance. Shortages of skilled workers in specific regions can lead to project delays and increased labour costs.

Source: Crisil Intelligence

Overview of optical fibre design and deployment market in UK

The optical fibre design and deployment market in the UK is characterised by a dynamic landscape shaped by technological advancements, regulatory frameworks and policy initiatives. It has experienced strong growth driven by the increasing demand for high-speed and reliable broadband connectivity. With the government's emphasis on digital transformation and the rollout of advanced technologies, the need for a robust optical fibre infrastructure is growing in the country. The optical fibre cable sector, contributing an estimated ~ £88 million to the UK economy (as per Trade

Remedies Authority, UK), plays a pivotal role in delivering broadband services in the country, with approximately 5.7 million fibre kilometres sold in 2021.

The UK government has implemented protective measures to safeguard the nation's expanding optical fibre cables industry from unfair trade practices, particularly that for China. The decision follows an investigation by the Trade Remedies Authority (TRA), which explored potential dumping and subsidisation issues.

The TRA's inquiry focused on determining whether imported optical fibre cables were sold in the UK at prices below domestic values or whether they were influenced by unfair subsidies. With the UK optical fibre cable market expected to grow in the coming years driven by broadband demand and government initiatives such as Project Gigabit, the TRA found out that around half of the market demand was met with domestically produced optical fibre and the remainder via imports from China, India, the US, Poland and Germany.

The investigation revealed that the UK market suffered injury from both subsidised and dumped optical fibre cables from China. In response, measures were introduced to protect the domestic industry. The newly imposed anti-dumping duties range from 23% to 46.2%, while countervailing duties fall between 10.62% and 11.79%. These measures are aimed at ensuring fair competition, supporting the growth of the UK optical fibre cables industry and maintaining the integrity of the broadband infrastructure landscape.

Overview of key aspects of regulatory and policy environment

Parameter	Description
Ofcom regulations	The Office of Communications (Ofcom) is the regulatory authority overseeing the communications sector in the UK. It plays a crucial role in regulating and promoting competition in the optical fibre market. Its policies focus on ensuring fair competition, encouraging investment in high-speed broadband infrastructure and fostering consumer interests.
Government initiatives	The UK government has launched initiatives to promote the deployment of full-fibre networks. The Fibre First and Project Gigabit programmes aim to accelerate the rollout of gigabit-capable broadband across the country. Financial incentives and support mechanisms are in place to encourage private sector investments in optical fibre infrastructure.
Digital strategy	The UK's digital strategy outlines a commitment to providing world-class digital infrastructure, with a specific focus on full-fibre and 5G networks. This strategy aligns with the goal of making the UK a global leader in digital connectivity.
National Infrastructure Commission (NIC)	The NIC provides strategic advice to the government on infrastructure challenges. It has emphasised the importance of prioritising full-fibre and 5G infrastructure to enhance the country's competitiveness.
Local authorities and planning	Local authorities play a role in facilitating the deployment of optical fibre networks. Planning policies and permissions are crucial factors influencing the speed and efficiency of network rollout
Openreach and market competition	Openreach, a subsidiary of the BT Group, holds a strong position in the UK's optical fibre market. Regulatory measures are aimed at ensuring fair access to Openreach's infrastructure, promoting competition among service providers.

Parameter	Description
International collaboration	<p>The UK collaborates with international partners to share best practices and align standards in optical fibre technology. This collaboration contributes to the global interoperability of optical fibre networks.</p> <p>While regulatory measures and government initiatives promote the growth of the optical fibre design and deployment market, challenges, such as ensuring rural connectivity, addressing planning constraints and navigating complex supply-chain dynamics, remain. The market presents opportunities for innovation, collaboration and investment to meet the evolving connectivity needs of businesses and consumers across the UK. These developments underscore the intricate interplay between regulatory frameworks, government policies and industry dynamics shaping the optical fibre design and deployment market in the UK.</p>

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Crisil Limited: Lightbridge IT Park, Saki Vihar Road, Andheri East, Mumbai 400 072, India

Phone: +91 22 6137 3000 | <https://Intelligence.Crisil.com>

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