Industry Report on IT Infrastructure Industry in India

May 2024

Disclaimer

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Global Macroeconomic Scenario

The global economy, estimated at 3.1% in 2023, is expected to show resilience at 3.1% in 2024 before rising modestly to 3.2% in 2025. Between 2021 – 2022, global banks were carrying a historically high debt burden after COVID-19. Central banks took tight monetary measures to control inflation and spike in commodity prices. Russia's war with Ukraine further affected the global supply chains and inflated the prices of energy and other food items. These factors coupled with war-related economic sanctions impacted the economic activities in Europe. Any further escalation in the war may further affect the rebound of the economy in Europe.

While China was facing a crisis in the real estate sector and prices of properties were declining between 2020 - 2023, with the reopening of the economy, consumer demand is picking up again. The Chinese authorities have taken a variety of measures, including additional monetary easing, tax relief for corporates, and new vaccination targets for the elderly. The government has also taken steps to help the real estate sector including cracking down on debt-ridden developers, announcing stimulus for the sector and measures to encourage the completion and delivery of unfinished real estate projects. The sector is now witnessing investments from developers and demand from buyers.

Global headline inflation is set to fall from an estimated 6.8% in CY 2023 to 5.8% in CY 2024 and to 4.4% in CY 2025. This fall is swifter than anticipated across various areas, amid the resolution of supply-related problems and tight monetary policies. Reduced inflation mirrors the diminishing impact of price shocks, particularly in energy, and their subsequent influence on core inflation. This decrease also stems from a relaxation in labour market pressure, characterized by fewer job openings, a slight uptick in unemployment, and increased labour availability, occasionally due to a significant influx of immigrants.

Global GDP Growth Scenario

The global economy started to rise from its lowest levels after countries started to lift the lockdown in 2020 and 2021. The pandemic lockdown was a key factor as it affected economic activities resulting in a recession in the year CY 2020, as the GDP growth touched -3.3%.

In CY 2021 disruption in the supply chain affected most of the advanced economies as well as low-income developing economies. The rapid spread of Delta and the threat of new variants in mid of CY 2021 further increased uncertainty in the global economic environment.

Global economic activities experienced a sharper-than-expected slowdown in CY 2022. One of the highest inflations in decades, seen in 2022, forced most of the central banks to tighten their fiscal policies. Russia's invasion of Ukraine affected the global food supply resulting in a further increment in the cost of living.

Further, despite initial resilience earlier in 2023, marked by a rebound in reopening and progress in curbing inflation from the previous year's highs, the situation remained precarious. Economic activity lagged behind its pre-pandemic trajectory, particularly in emerging markets and developing economies, leading to widening disparities among regions. Numerous factors are impeding the recovery, including the lasting impacts of the

pandemic and geopolitical tensions, as well as cyclically-driven factors such as tightening monetary policies to combat inflation, the reduction of fiscal support amidst high debt levels, and the occurrence of extreme weather events. As a result, global growth declined from 3.5% in CY 2022 to 3.1% in CY 2023.
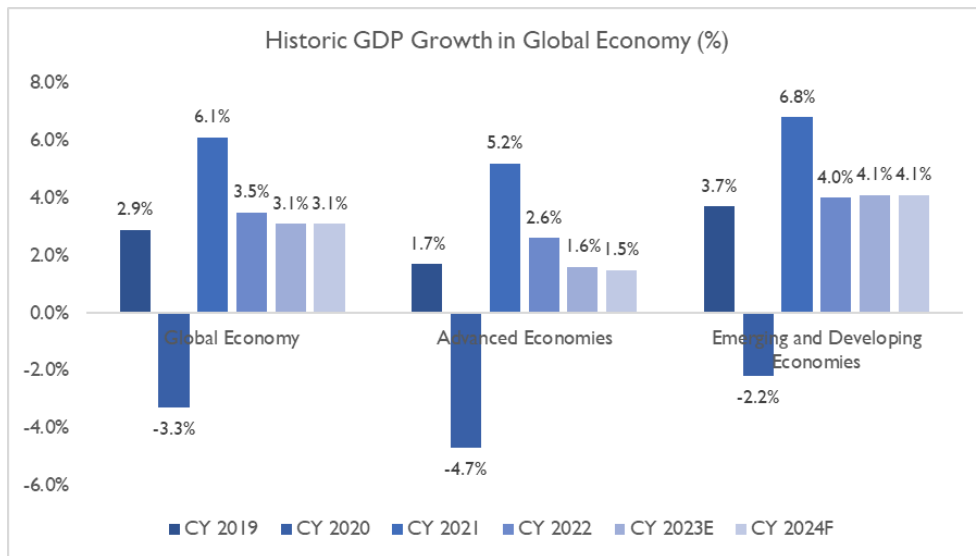
Source – IMF Global GDP Forecast Release 2024

Note: Advanced Economies and Emerging & Developing Economies are as per the classification of the World Economic Outlook (WEO). This classification is not based on strict criteria, economic or otherwise, and it has evolved over time. It comprises of 40 countries under the Advanced Economies including the G7 (the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada) and selected countries from the Euro Zone (Germany, Italy, France etc.). The group of emerging market and developing economies (156) includes all those that are not classified as Advanced Economies (India, China, Brazil, Malaysia etc.)

In the current scenario, global GDP growth is estimated to have recorded a moderate growth of 3.1% in CY 2023 as compared to 3.5% growth in CY 2022. While high inflation and rising borrowing costs are affecting private consumption, on the other hand, fiscal consolidation is affecting government consumption.

Slowed growth in developed economies will affect the GDP growth in CY 2024 and global GDP is expected to record a flat growth of 3.1% in CY 2024. The crisis in the housing sector, bank lending, and industrial sectors are affecting the growth of global GDP. Inflation forced central banks to adopt tight monetary policies. After touching the peak in 2022, inflationary pressures slowly eased out in 2023. This environment weighs in for interest rate cuts by many monetary authorities.

Global GDP Growth Forecast (%)
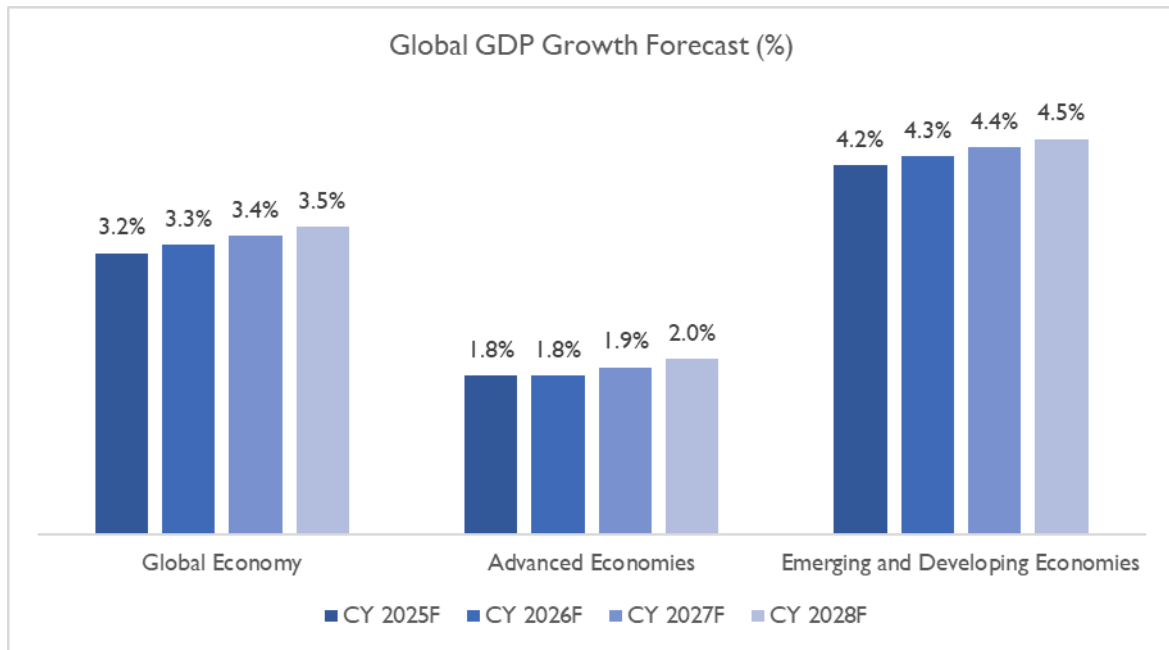
Source – IMF Global GDP Forecast Release 2024, D&B Estimates

GDP Growth Across Major Regions

GDP growth of major regions including Europe, Latin America & The Caribbean, Middle East & Central Asia, and Sub-Saharan Africa, were showing signs of slow growth and recession between 2020 – 2023, but leaving Latin America & The Caribbean, 2024 is expected to show resilience and growth. Meanwhile, GDP growth in Emerging and Developing Asia (India, China, Indonesia, Malaysia etc.) is expected to decrease from 5.4% in CY 2023 to 5.2% in CY 2024, while in the United States, it is expected to decrease from 2.5% in CY 2023 to 2.1% in CY 2024.

Historic GDP Growth Across Major Regions (%)
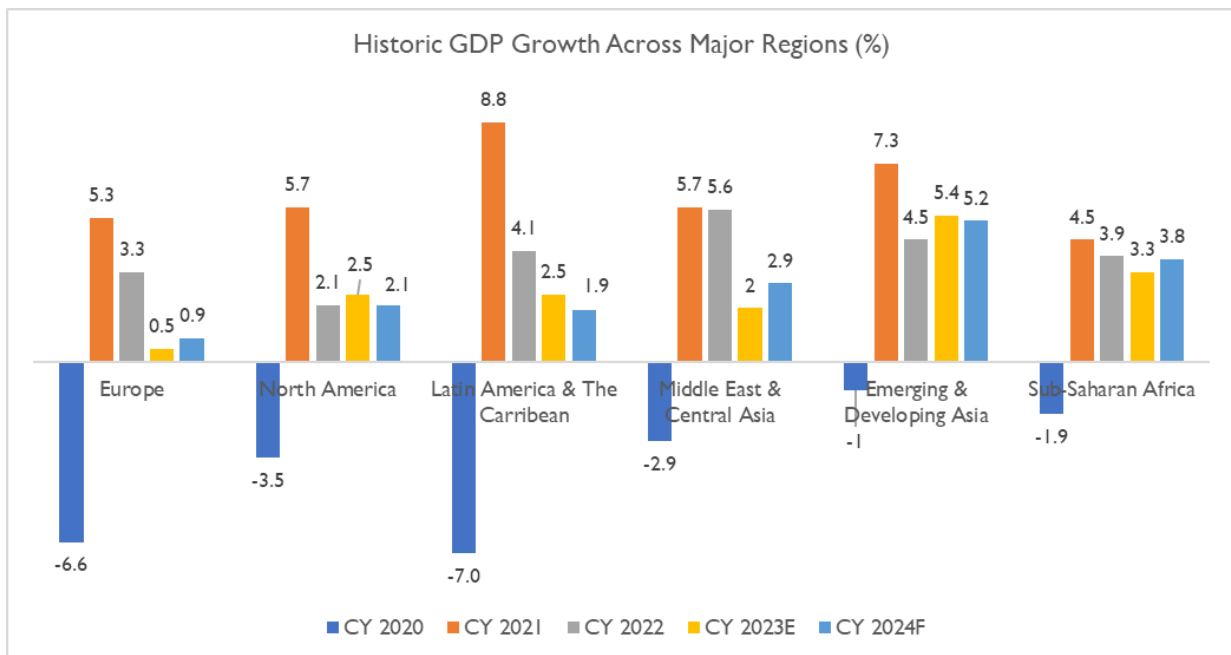
Source-IMF World Economic Outlook January 2024 update

Except for Emerging and Developing Asia, Latin America & The Caribbean and the United States, all other regions are expected to record an increase in GDP growth rate in CY 2024 as compared to CY 2023. GDP growth in Latin America & The Caribbean is expected to decline due to negative growth in Argentina. Further, growth in the United States is expected to come down at 2.1% in CY 2024 due to lagged effects of monetary policy tightening, gradual fiscal tightening, and a softening in labour markets slowing aggregate demand.

Although Europe experienced a less robust performance in 2023, the recovery in 2024 is expected to be driven by increased household consumption as the impact of energy price shocks diminishes and inflation decreases, thereby bolstering real income growth. Meanwhile, India and China saw greater-than-anticipated growth in 2023 due to heightened government spending and robust domestic demand, respectively. Sub-Saharan Africa's expected growth in 2024 is attributed to the diminishing negative impacts of previous weather shocks and gradual improvements in supply issues.
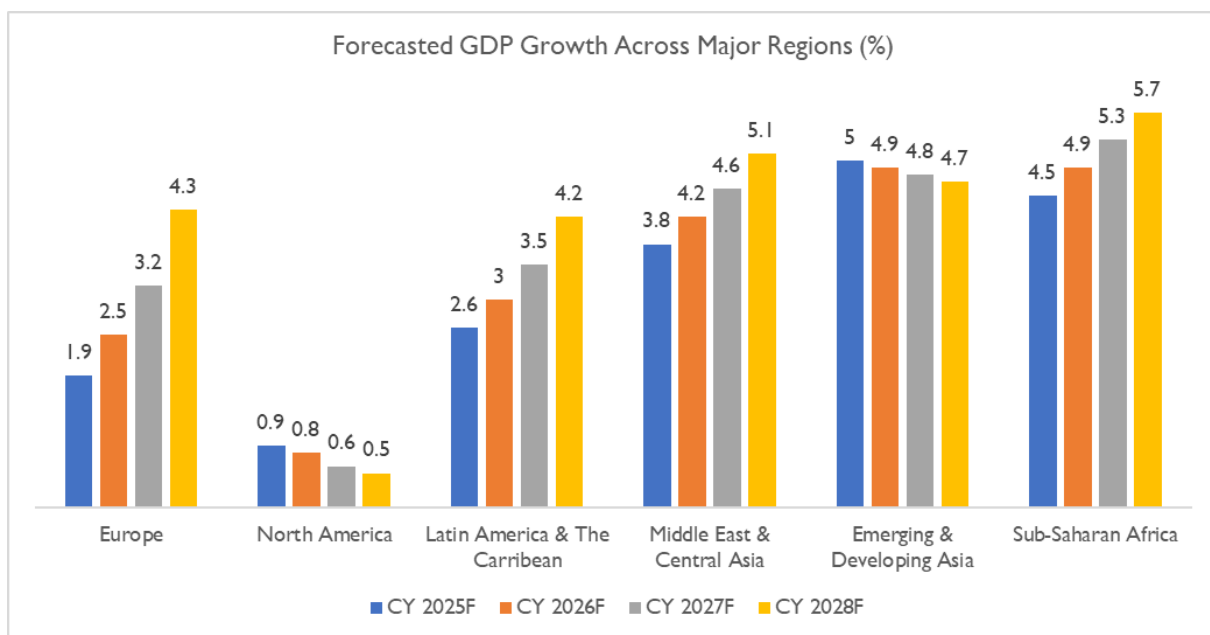
Source-IMF, OECD, and World Bank, D&B Estimates

India Macroeconomic Analysis

GDP Growth Scenario

India's economy is showing signs of resilience with GDP growing to estimated 7.3% in FY 2024. Although this translates into only a slight uptick in demand (compared to FY 2023- 7.2%), the GDP growth in FY 2023 represents a return to pre pandemic era growth path. Despite this moderation in growth, India continues to remain one of the fastest growing economies in the world.

Country	Real GDP Growth (2023)
India	**6.3%**
United Kingdom	0.5%
Italy	0.7%
Canada	1.3%
China	5.0%
Brazil	3.1%
France	1.3%
United States	2.1%
South Africa	0.9%
Germany	-0.5%
Japan	2.0%
Russia	2.2%

Source: IMF

Countries considered include - Largest Developed Economies and BRICS (Brazil, Russia, India, China, and South)

Countries have been arranged in descending order of GDP growth

There are quite a few factors aiding India's economic recovery – notably its resilience to external shocks (ongoing Russia – Ukraine conflict) and rebound in private consumption. This rebound in private consumption is bringing back the focus on improvements in domestic demand, which together with revival in export demand is a precursor to higher industrial activity. Already the capacity utilization rates in Indian manufacturing sector are recovering as industries have stepped up their production volumes. As this momentum sustains, the country may enter a new capex cycle. The universal vaccination program by the Government has played a big part in reinstating confidence among the population, in turn helping to revive private consumption.

Realizing the need to impart external stimuli, the Government stepped up its spending on infrastructure projects which in turn had a positive impact on economic growth. The capital expenditure of central

government increased by nearly 24.5% during FY 2023 as compared to the previous fiscal. The improvement was accentuated further as the Union Budget 2023-2024 announced 37.4% increase in capital expenditure (budget estimates), to the tune of Rs 10 trillion. The announcement also included 30% increase in financial assistance to states at Rs 1.3 trillion for capex. This has provided the much-needed confidence to private sector, and in turn attracted private investment.

On the lending side, the financial health of major banks has witnessed an improvement which has helped in improving the credit supply. With capacity utilization improving, there would be demand for credit from corporate sector to fund the next round of expansion plans. Banking industry is well poised to address that demand. Underlining the improving credit scenario is the credit growth to micro, small and medium enterprise (MSME) sector as the credit outstanding to the MSME sector by scheduled commercial banks in the financial year FY 2023 grew by 12.3% to Rs 22.6 trillion compared to FY 2022. The extended Emergency Credit Linked Guarantee Scheme (ECLGS) by the Union Government has played a major role in improving this credit supply.

India's GDP in FY 2023 grew by 7.2% compared to 9.1% in the previous fiscal on the back of slowing domestic as well as external demand owing to series of interest rate hikes globally to tackle high inflation. The year-on-year moderation in growth rate is also partly due to a fading impact of pandemic-induced base effects which had contributed towards higher growth in FY 2022. On quarterly basis, the country growth moderated in Q2 and Q3 of FY 2023 which highlights impact of slowing economy on the back of monetary tightening. During Q3 FY 2023, the country's GDP grew by 4.36% against 6.28% y-o-y increase in the corresponding quarter last fiscal. However, the fourth quarter of FY 2023 saw a rebound in growth rate, indicating an optimistic scenario.
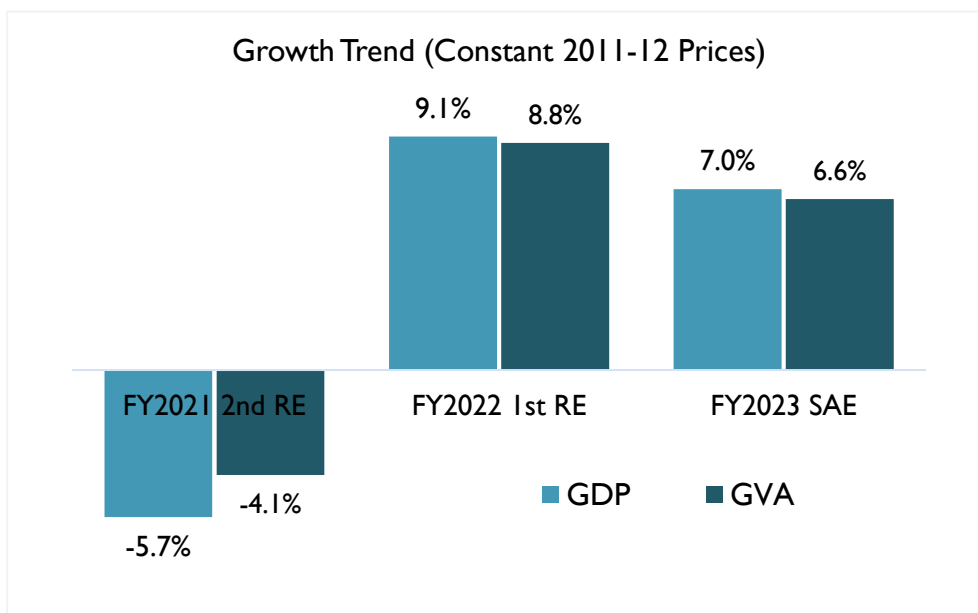
Source: Ministry of Statistics & Programme Implementation (MOSPI)

RE stands for Revised Estimates, SAE stands for Second Advance Estimates

Quarterly Growth (Yearly Change)
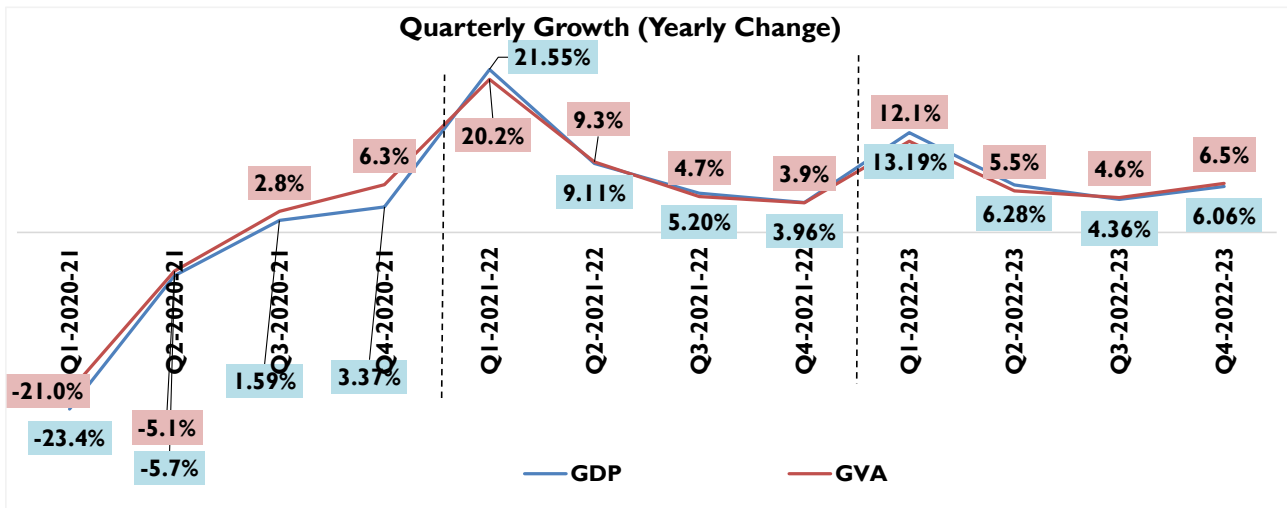
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Sectoral Growth Trend: Annual

Sectoral analysis of GVA reveals growth tapered sharply in industrial sector which is estimated to have grown by just 3.6% in FY 2023 against 11.6% in FY 2022. In the industrial sector, growth across major economic activity such as mining, manufacturing, construction sector slowed registering a growth of 3.4%, 0.6% and 9.1% in FY 2023 against a growth rate of 7.1%, 11.05% and 14.8% recorded in FY 2022, respectively. Utilities sector too observed a marginal moderation in y-o-y growth to 9.2% against a decline of 3.6% in the previous years.

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Sectoral GVA Growth
(at constant prices 2011-12)
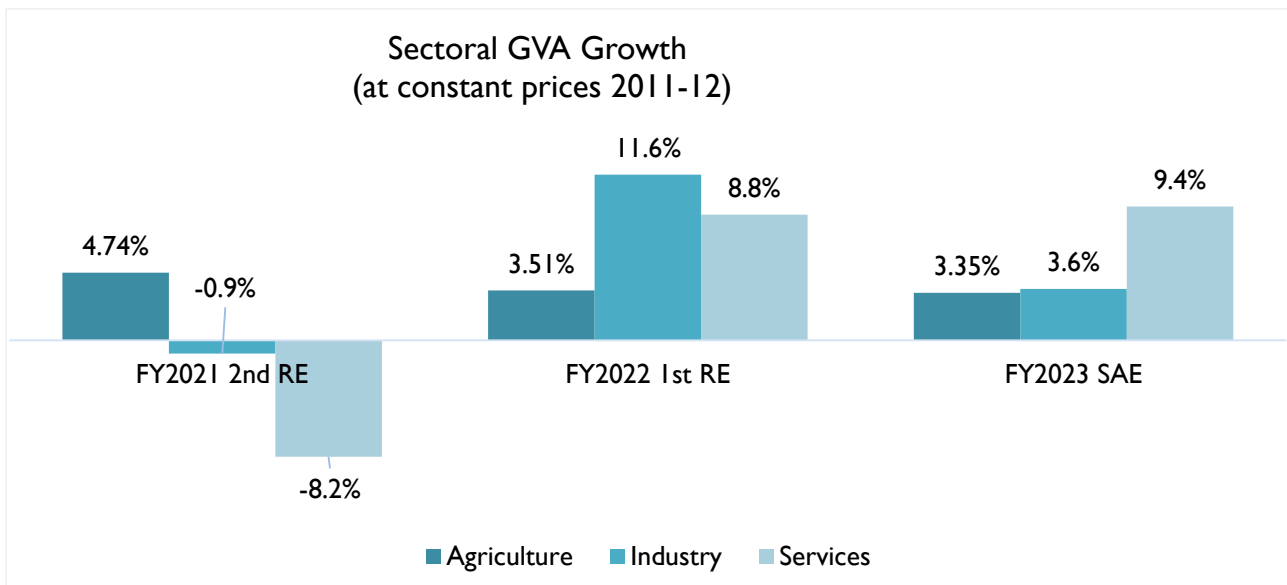
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Talking about the services sectors performance, with major relaxation in covid restriction, progress on covid vaccination and living with virus attitude, business in service sector gradually returned to normalcy in FY 2022. Economic recovery was supported by the service sector as individual mobility returned to pre-

pandemic level. The trade, hotel, transport, communication, and broadcasting segment continued to strengthen and grow by 14.18% in FY 2023 against 13.75% in the previous year and financial services, real estate and professional services sector recorded 6.85% y-o-y growth against 4.73%. However, overall service sector growth was curbed by moderation in public administration and defence services sector which recorded 7.12% yearly increase against 9.7% increase in the previous year.
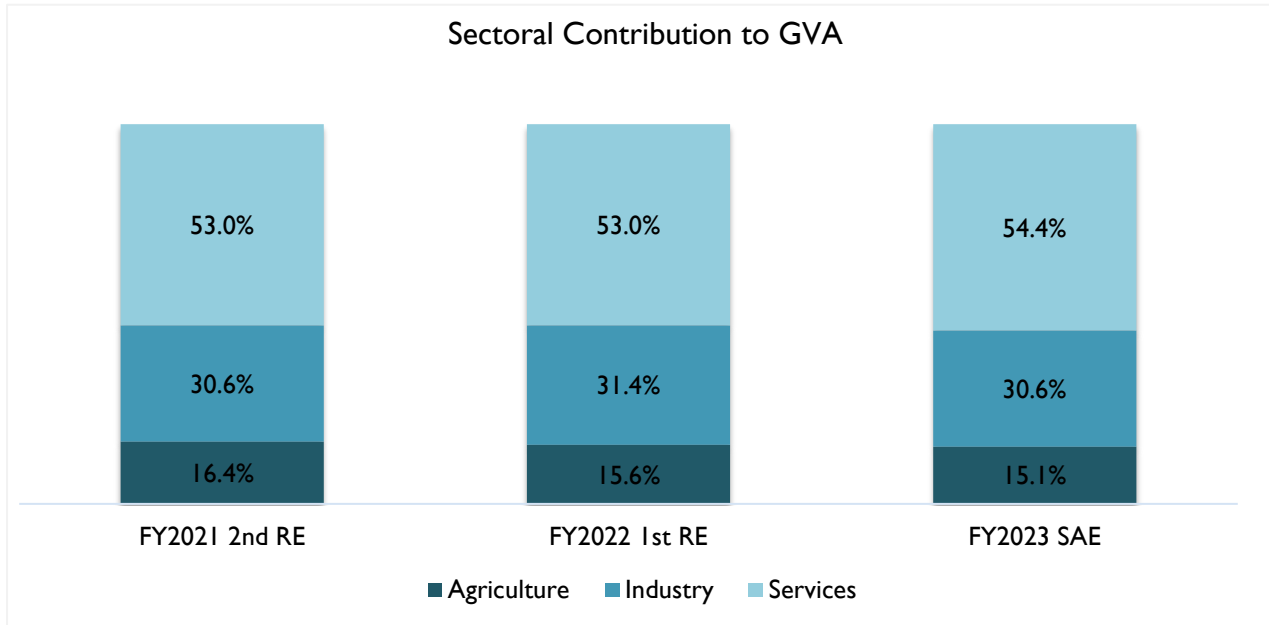
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Sectoral Growth Trend: Quarterly

Quarterly GVA number indicated sustained weakness in economic activity during Q2 and Q3 FY 2023 with manufacturing activity being the worst hit segment amongst the industrial sectors. India's manufacturing sector shrank by 1.1% on-year in Q3 FY 2023, a second straight contraction highlighting the continuing weakness in consumer demand and exports. However, Q4 FY 2023, manufacturing sector output was rose by 4.5% compared to the corresponding quarter last year (0.62%).

Agriculture sector GVA strengthen in Q3 FY 2023 to register 3.68% yearly growth, and further to 5.47% in Q4 FY 2023 compared to the corresponding quarter last year (4.06%). Any growth between 3.5-4% in farm sector is considered above the long-term trend line. Construction sector witnessed 8.39% y-o-y growth in Q3 of FY 2023, and a further growth of 10.39% against 4.93% y-o-y growth in the previous quarter (Q4 FY 2023). Mining and quarrying sector, and Electricity, gas, water supply & other utility services sector registered 4.3% and 6.85% y-o-y growth in Q4 FY 2023 against 2.33% and 6.73%, respectively in Q4 FY 2022.

Within service sector, quarterly growth moderated across all segments in Q3 and Q4 FY 2023 against the previous quarter. Trade, hotel, transport, communication, and broadcasting segment observed 9.06% y-o-y growth in Q4 FY 2023 as compared to 15.64% growth in Q2 FY 2023. Other services sector broadly classified under Public Admin, Defence & Other Services and Financial, Real Estate & Professional Services too observed 3.12% and 7.11% growth in Q4 FY 2023 against 5.57% and 7.13% y-o-y change in Q2 FY 2023.

In Q1 FY 2024, agriculture sector recorded a y-o-y growth of 3.35% over the same period last year, whereas recorded a decline from the previous quarter standing at 5.47%. It further recorded an even slowed growth at 1.31% in Q2 FY 2024, as corresponding to 2.40% annual growth observed in Q2 FY 2023. The service sector in Q1 FY 2024 recorded an annual growth at 10.27%, and showed an increase from the previous quarter (6.88%). However, Q2 FY 2024 in services saw a moderation, and recorded an annual growth of 5.76%.

The manufacturing sector output saw a phenomenal y-o-y growth in Q2 FY 2024, recorded at 13.60%, as compared to the negative growth of -3.57% observed in Q2 FY 2023. The overall industry trend recorded a growth of 12.97% in Q2 FY 2024, as compared to -0.36% recorded in the same period previous year, as well as 5.26% recorded in the previous quarter.
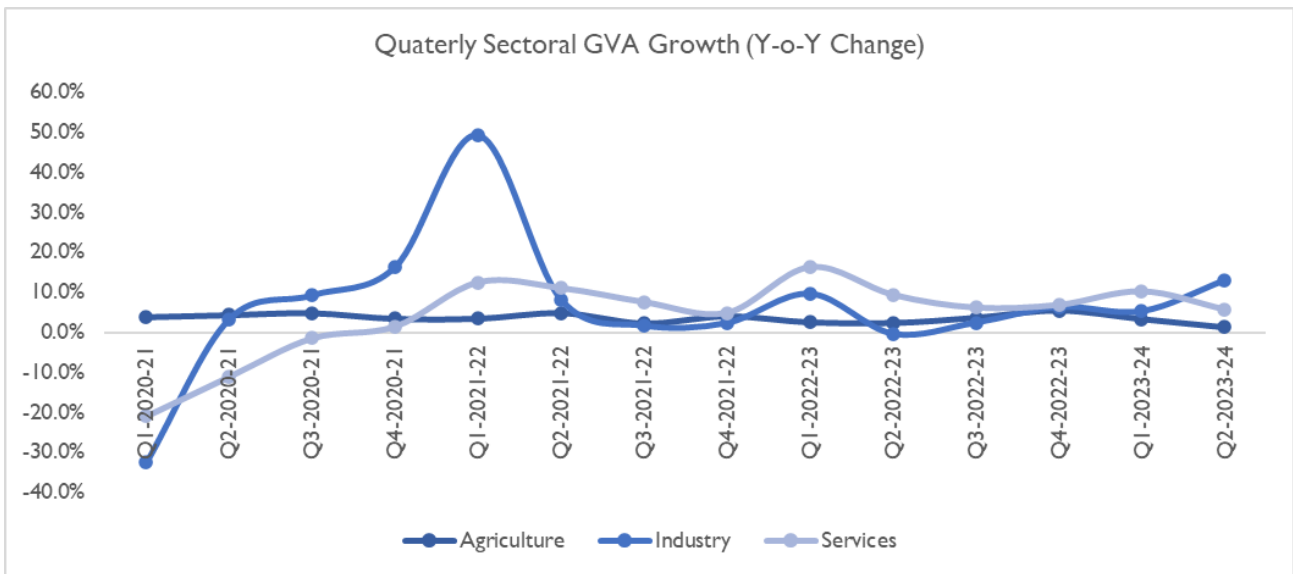
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Index of Industrial Production

After experiencing three years of deteriorating industry growth, the country's Index of Industrial Production (IIP) index registered 11.4% y-o-y growth in FY 2022 where growth was evenly spread across all sub-segments. After the stark rise experienced in economy after the Covid-19 pandemic, growth in FY 2023 moderated to 5.2%. Electricity index registered 8.9% y-o-y growth in FY 2032 followed by the mining sector index. Classified based on usage i.e., infrastructure/construction goods, capital good, intermediate good and consumer durable outperformed over the other sector and registered healthy double-digit growth.

Annual IIP Growth
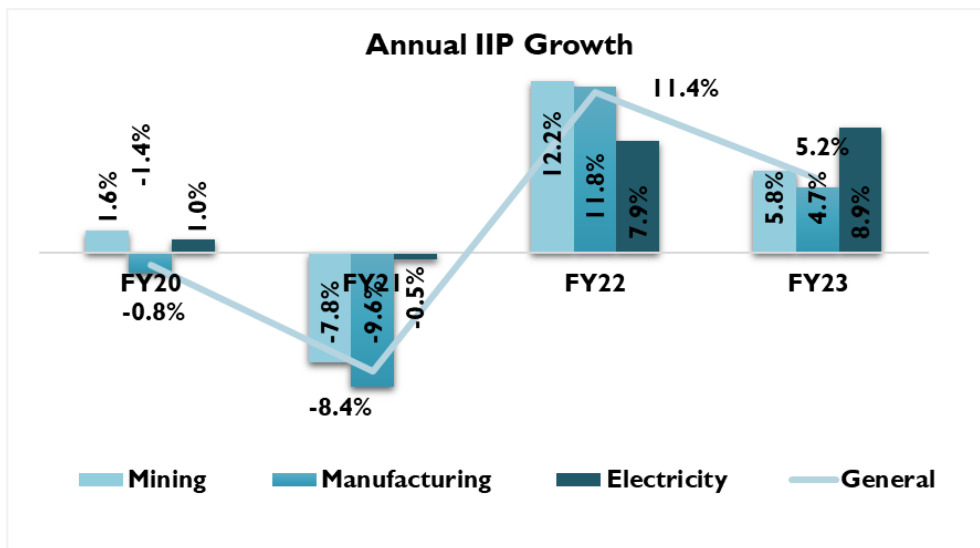
Source: Ministry of Statistics & Programme Implementation (MOSPI)
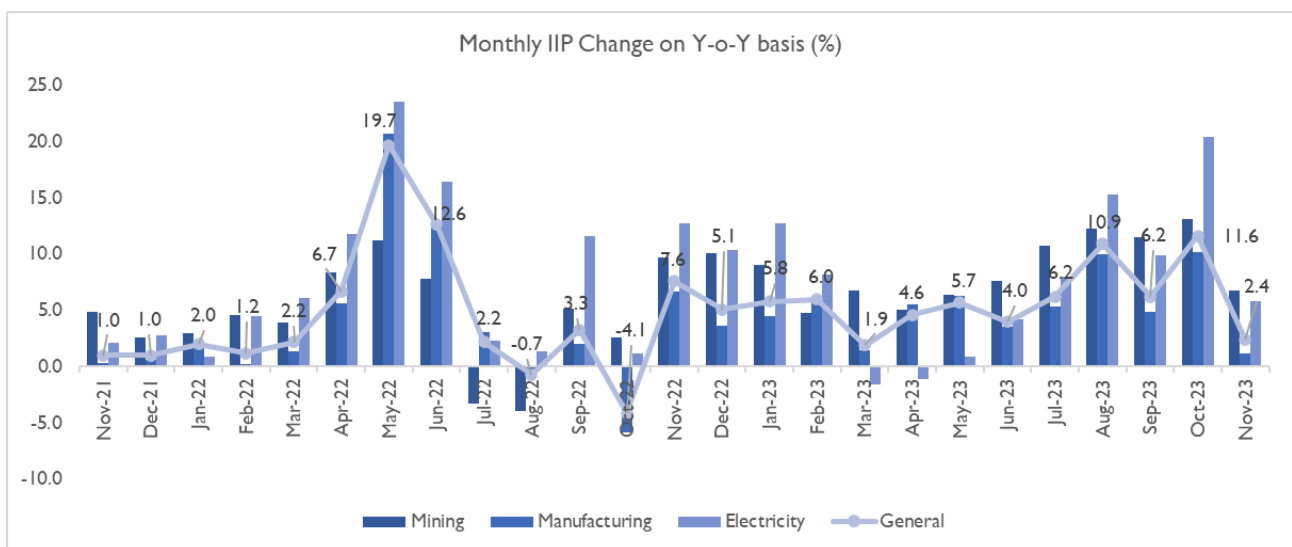
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Between November 2021 – November 2022, the IIP index improved steadily between Nov'21 to May'22 but moderated sharply in the subsequent four months and it measured lowest in October 2022 while it showed temporary improvement by growing at 7.3% in subsequent. However, IIP again moderated to register 5.1 % y-o-y growth in December 2022. Manufacturing activity which has 77.6% weightage in the overall index, grew by 2.6% in December 2022 while mining activity and electricity index grew by 9.8% and 10.4%, respectively.

On y-o-y basis, monthly IIP growth in December 2022 was relatively higher compared to December 2021 due to low base effect where overall IIP was adversely affected by onset of third wave of pandemic. Between November 2022 – November 2023, IIP growth declined from levels of 7.6% in Nov'22 to 1.9% in Mar'23. However, the subsequent months in 2023 saw a trend of growth, with Aug'23 and Oct'23 recording a high of 10.9% and 11.6% respectively on back of growing demand and record festive sales.

Use-Based Classification: IIP (Y-o-Y Growth)

276	3.34	82.572
225	2.86	78.598
200	2.70	74.102
INR Bn		
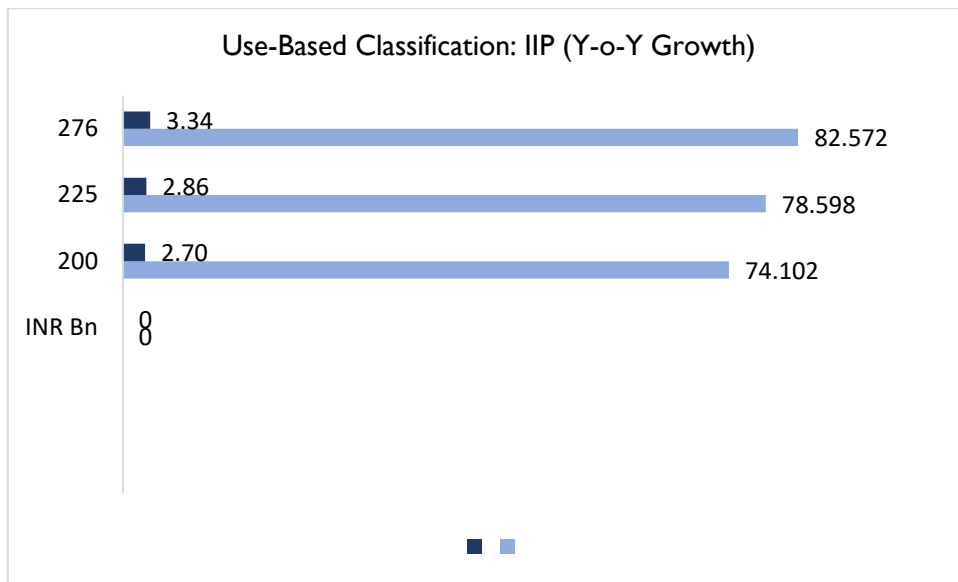
Sources: MOSPI

As per the use-based classification, growth in all segments deteriorated for FY 2023 as compared to FY 2022. Consumer good and intermediate goods were worst hit segments followed by infrastructure / construction Goods. The contracting IIP data points towards adverse operating business climate as global headwinds, high inflation, and monetary tightening started having adverse impact on manufacturing activity in FY 2023.

Investment & Consumption Scenario

Other major indicators such as Gross fixed capital formation (GFCF), a measure of investments, moderated between Q2 FY 2023 – Q1 FY 2024, after a rise of 20.6% observed in Q1 FY 2023. However, Q2 FY 2024 saw some quarter-on-quarter improvement in performance at 10.9%, as well as annual growth against 9.7% recorded in Q2 2023.Despite the festive season demand and largely a covid-free economy, Private Final Consumption Expenditure (PFCE) a realistic proxy to gauge household spending, observed a continued moderation in Q3 FY 2023 where yearly growth softened to 2.1% which was nearly 8.8% lower compared to Q2 FY 2023. Q1 FY 2024 saw growth, observing a PFCE of 5.7%, followed by steep moderation to 2.6% in Q2 FY 2024.

Quarterly Capital Investment Trend in India

	Q1 FY2022	Q2 FY2022	Q3 FY2022	Q4 FY2022	Q1 FY2023	Q2 FY2023	Q3 FY2023	Q4 FY2023	Q1 FY2024	Q2 FY2024
GFCF (y-o-y)	61.0%	12.4%	1.2%	4.9%	20.6%	9.7%	8.3%	8.9%	7.8%	10.9%
Investment To GDP Ratio	32.6%	33.1%	30.6%	34.3%	34.7%	34.2%	31.7%	35.3%	34.7%	35.3%

Quarterly Private Consumption Trend in India, PFCE (Y-o-Y Growth, in %)

Q1 FY2022	Q2 FY2022	Q3 FY2022	Q4 FY2022	Q1 FY2023	Q2 FY2023	Q3 FY2023	Q4 FY2023	Q1 FY2024	Q2 FY2024
17.6%	14.2%	10.8%	4.7%	20.0%	8.8%	2.1%	2.8%	5.7%	2.6%

Sources: MOSPI

Inflation Scenario

Wholesale Price Index (WPI) is moderating on the back of softening of prices. Compared to April 22, WPI in April 2023 dropped by -0.9%. This is primary on the back of softening of fuel & power prices. Monthly y-o-y change (April 2023 v/s April 2022) for manufactured products was -2.9%, and this too contributed to the moderation in WPI. Softening prices of mineral oils, chemicals & chemical products, textiles, crude petroleum & natural gas, textiles, and food products. contributed towards moderation in WPI inflation.

Monthly (Y-oY) Change in WPI , (2011-12)
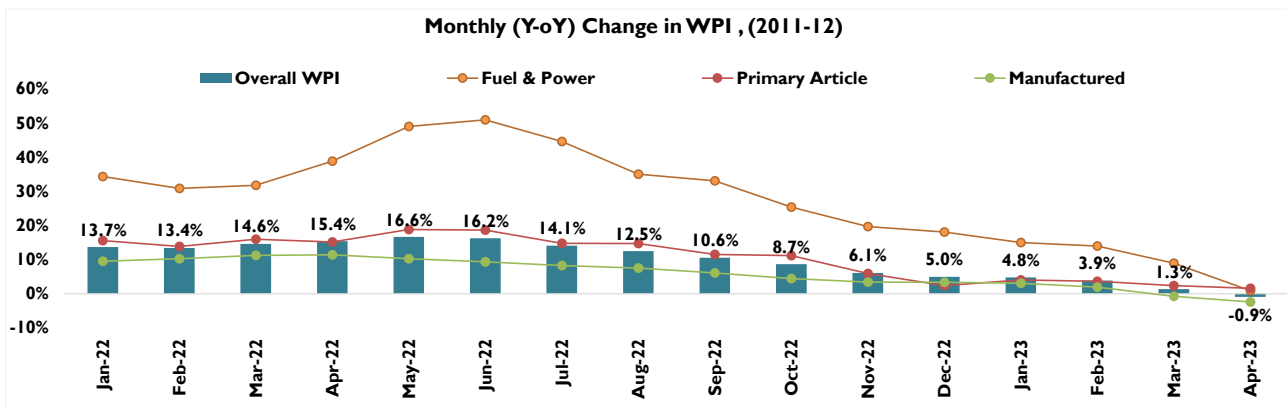
Source: MOSPI, Office of Economic Advisor

Y-o-Y Growth in Monthly Consumer Price Indices (2011-12 Series)
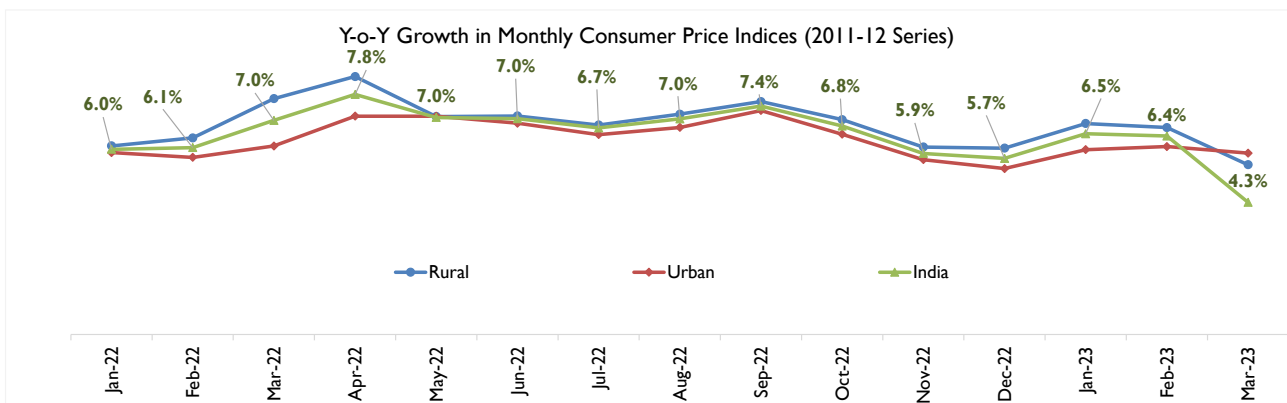
Source: CMIE Economic Outlook

Retail inflation rate (as measured by Consumer Price Index) again jumped above 6% tolerance limit of the central bank in January 2023 after observing mild moderation in the previous two month. The overall CPI grew by 6.5% in January 2023 due to spike in food inflation and CPI food index grew by 5.9% during FY 2023 against 4.2% y-o-y growth in the previous year. Within food index, Cereals and product-led food inflation reached 16.1 per cent in January 2023 from 13.8 per cent in December 2022. As a part of anti-inflationary measure, the RBI has hiked the repo rate by 225 bps since May 2022 to current 6.5% (May 2023), with latest fourth round hike announced on 8 Feb 2023. The Reserve Bank of India has estimated an average inflation rate of 6.5% for FY 2023. Since then, retail inflation appears to be softening, as it grew by 6.4% and 4.3% respectively in February and March of 2023.

Growth Outlook

Amidst the difficult and uncertain external economic environment, the Indian government has delivered a balanced Union Budget which focuses on achieving an inclusive and sustainable growth while adhering to the fiscal glide path. Notwithstanding the external risk, there is a sustained momentum in economic activity supported by domestic drivers. The consumer confidence survey by the Reserve bank of India points towards rising confidence of households both for the current situation as well as the future expectations (for a one-year period).

Rural demand is likely to be boosted by good prospects for agricultural output and discretionary spending is expected to support urban consumption supporting. Resilient domestic financial markets, sturdy growth in credit and the government's thrust on capital expenditure is expected to drive momentum in investment activity. Capacity utilization in the manufacturing sector has surpassed its long period average. Thus, the stance taken by the government to not only emphasize on the top-down approach to growth i.e focusing on substantial capital outlay, but also to place focus on the bottom of the pyramid by trying to unleash the potential of the primary sector in the Union Budget should support India's growth momentum in 2023.

Some of the key factors that would propel India's economic growth in the coming years

Government focus on infrastructure development

Infrastructure development has remained recurring theme in India's economic development. The launch of flagship policies like National Infrastructure Pipeline (NIP), and PM Gati Shakti plan have provided the coordination & collaboration that was lacking earlier. Both NIP and PM Gati Shakti are ambitious billion-dollar plans that aim to transform India's infrastructure, elevating it to the next level. These projects are expected to improve freight movement, debottleneck the logistics sector, and improve the industrial production landscape, which would provide the incremental growth in GDP. In its Union Budget FY 2023, the Government has increased the capital expenditure by 35% to nearly INR 7.5 lakh crore – which indicates the strong Government focus on improving the overall infrastructure landscape in India.

Development of Domestic Manufacturing Capability

The Government launched Production Linked Incentive (PLI) scheme in early 2020, initially aimed at improving domestic manufacturing capability in large scale electronic manufacturing and gradually extended to other sectors. At present it covers 14 sectors, ranging from medical devices to solar PV modules. The PLI scheme provides incentives to companies on incremental sales of products manufactured in India. This incentive structure is aimed to attracting private investment into setting up manufacturing units and thereby beef up the domestic production capabilities. The overall incentives earmarked for PLI scheme is estimated to be INR 2 lakh crore. If fully realizing the PLI scheme would have the ability to add nearly 4% to annual GDP growth, by way of incremental revenue generated from the newly formed manufacturing units.

Strong Domestic Demand

Domestic demand has traditionally been one of the strong drivers of Indian economy. After a brief lull caused by Covid-19 pandemic, the domestic demand is recovering. Consumer confidence surveys by Reserve Bank / other institutions are points to an improvement in consumer confidence index, which is a precursor of improving demand. India has a strong middle-class segment which has been the major driver of domestic demand. Factors like fast paced urbanization and improving income scenario in rural markets are expected to accelerate domestic demand further. This revival is perfectly captured by the private final consumption expenditure (PFCE) metric. PFCE as a percentage of GDP increased to nearly 59.2% during the first half of

FY 2023[1], which is the highest level it has achieved during the past few years. Although pent-up demand has played a part in this surge, this is an indication of normalization of demand.

There are two factors that are driving this domestic demand: One the large pool of consumers and second the improvement in purchasing power.

- The share of middle class increased from nearly 14% in 2005 to nearly 30% in 2021 and is expected to cross 60% by 2047 (Placeholder1)[2]. This expanding middle class household segment is fuelling India's growth story and would continue to play a key role in propelling India's economic growth.

- As per National Statistics Office (NSO) India's per capita income (in current prices) stood at INR 1.72 lakhs in FY 2023 which is nearly double of what it was in FY 2015. This increase in per capita income has impacted the purchasing pattern as well as disposable spending pattern in the country. Consumer driven domestic demand is majorly fuelled by this growth in per capita income.

Digitization Reforms

Ongoing digitization reforms and the resultant efficiency gains accrued would be a key economic growth driver in India in the medium to long term. Development of digital platforms has helped in the seamless roll out of initiatives like UPI, Aadhaar based benefit transfer programs, and streamlining of GST collections. All of these have contributed to improving the economic output in the country. Some of the key factors that have supported the digitization reforms include – the growth in internet penetration in India together with drop in data tariffs, growth in smartphone penetration, favourable demographic pattern (with higher percentage of tech savy youth population) and India's strong IT sector which was leveraged to put in place the digital ecosystem. All these factors are expected to remain supportive and continue to propel the digitization reforms in India.

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[1] India Economic Survey FY 2023, Full year data is yet to be released
[2] As per the survey conducted by People Research on India's Consumer Economy. Households with annual income in the range of INR 5 – 30 lakh is considered as middle class households

Indian Information Technology Industry

According to NASSCOM, the Indian Information Technology (IT) Industry is estimated to have clocked a revenue of USD 244.6 billion in FY 2023. Between FY 2020 – FY 2023, the revenue in the Indian Technology industry grew at a CAGR of 9.60%, recording a phenomenal growth. Annual turnover in the industry grew by nearly 8% in FY 2023, down from approximately 15.5% that was recorded during the previous year. This slowdown in growth during FY 2023 was primarily caused by unfavourable macroeconomic conditions, geopolitical uncertainties, and cautious spending by clients in the technology sector, resulting in delays in closing deals.
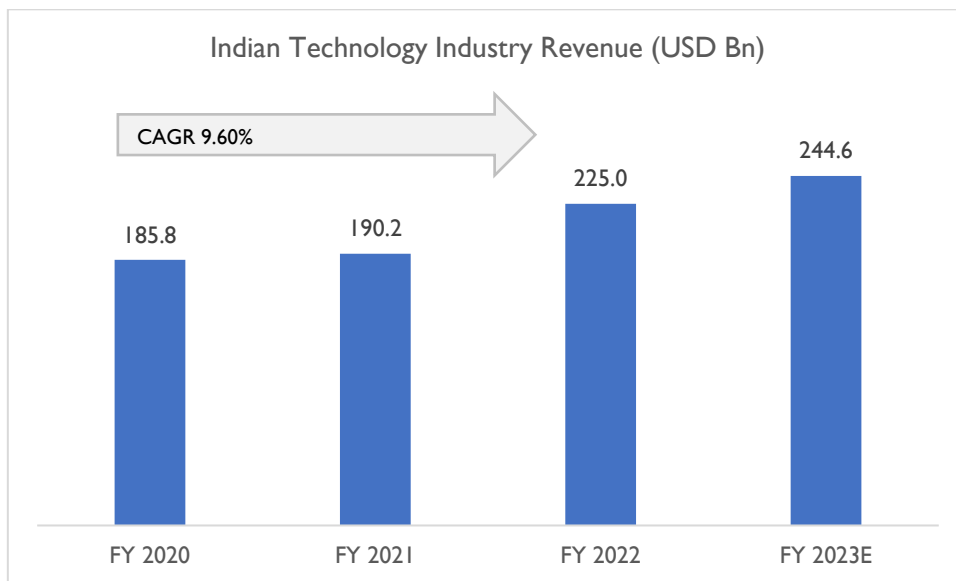
Source: NASSCOM

Over the past four quarters or so, technology firms, particularly those providing software services and generating a significant portion of their revenue from international markets like North America and Europe, have experienced subdued business activity due to the economic slowdown in these regions. However, there have been some positive factors, such as stronger performance in the engineering, research, and development (ER&D) sector, and the continued growth of global capability centers (GCCs), with India remaining a preferred location.

Indian IT industry is export oriented with exports contributing to nearly 79% of total industry revenue in FY 2023. India's IT export revenue is estimated to have grown to USD 194 billion in FY 2023 from USD 178 billion in FY 2022, registering 9% Y-o-Y growth, while domestic IT industry revenue is estimated to have grown by 4.1% on Y-o-Y basis to reach USD 51 Bn in FY 2023.

dun&bradstreet

Market Segmentation

By segmentation, the overall IT industry is estimated to earn 51.3% of the revenue from IT services while 19.5% from BPM services, 15.9% from ER&D, 7.5% from the IT hardware sector and 5.8% from software products in FY 2023.
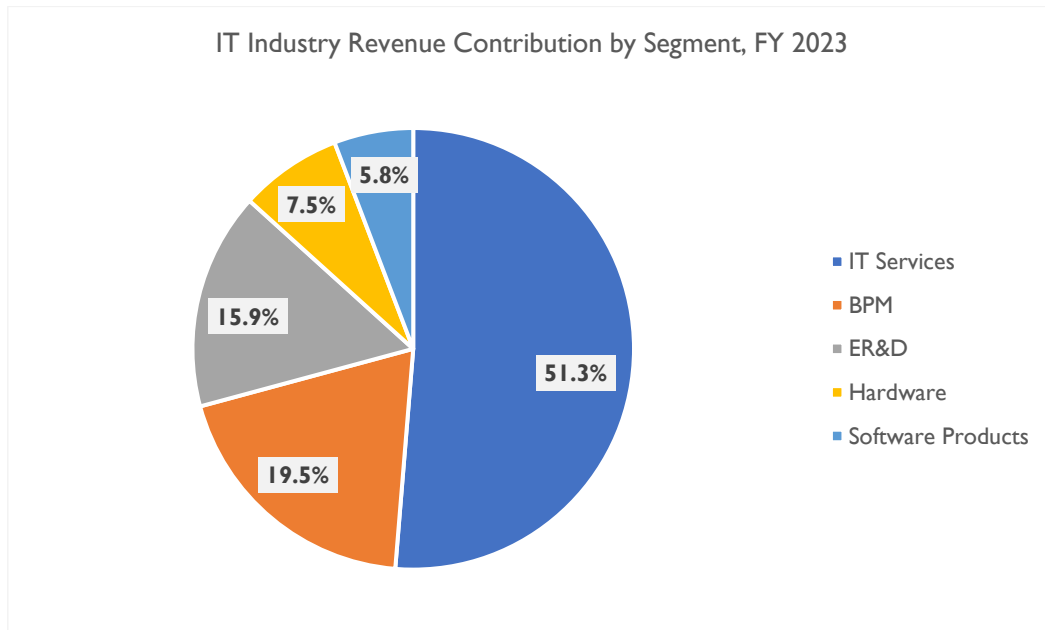
Source: NASSCOM

During the past two years, COVID-19 pandemic accelerated the technology adoption across industries as businesses relied on digital tools for resilience and business continuity. The overall industry revenue has been driven by the fast-paced digitization and cloud adoption. Digital revenue share stood at 30-32%, recording an incremental revenue of USD13 bn in FY2022, registering 25% growth on y-o-y basis. The industry observed over 290 cross border M&As deal with their primary focus as digital.

Export Revenue

Indian IT industry is export driven, with export contributing ~79% of the industry revenue in FY 2023. Within exports, IT services export accounts for the largest share while the share of hardware in export is negligible, as IT hardware manufactured in India is primarily consumed to meet domestic demand. IT services export contributed the most to total industry revenue with nearly 51% share followed by BPM and the ER&D. In FY 2023, the value of export revenue generated by IT industry is estimated to be USD 194 Bn, registering 9% y-o-y growth. Factors such as economy of scale, business risk mitigation, utilization improvement and superior competency have all lead to the growth of the Indian BPM industry.

Annual Export Revenue of Indian IT Industry (USD Bn)

CAGR: 10%

FY2020	FY2021	FY2022	FY2023
147	151	178	194
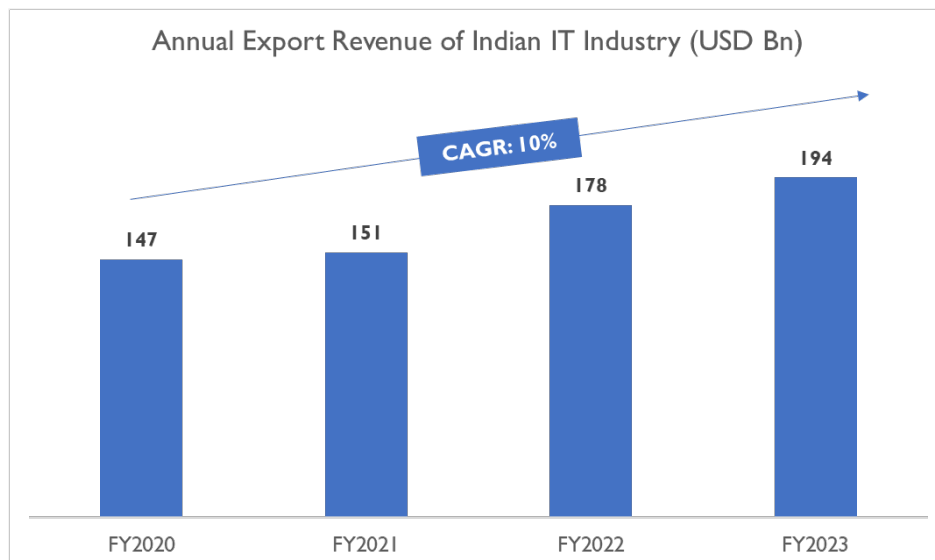
Source: Dun & Bradstreet Research

The USA, UK and EU remain the major markets for the IT software and services exports, accounting for ~90% of the total IT industry exports, however, there are new challenges surfacing in these traditional geographies. Consequently, India is exploring new opportunities in Asia Pacific (APAC), Latin America, Middle East Asia, Europe, Japan, China, and Africa along with catering to the demand to traditional market.

Key Demand Drivers

- **Large Talent Pool & Cost Competitiveness:** Presence of a large employee base with high IT skills and a cost differential with their peers in the developed markets of the US and Europe has helped the country emerge as a sought-after IT outsourcing destination. As per industry estimates, labour cost efficiency is up to 30-40% more than source countries (primarily US) that gives huge opportunity for the outsourcing business model to expand. Indian IT industry is a global talent powerhouse and a representative of millennials, showcasing diversity, and leadership in digital skills that too at competitive costs. India boasts of a digitally skilled talent pool of 1.6 million with over 30% increase in learning and development budget of companies. To fulfill the robust digital driven IT growth, tech companies are upskilled with 2.8 lakh employees in the digital space in FY 2022. In FY 2022, India's digital talent pool surged to 1.6 million from 1.17 Mn in FY 2021, registering 36.8% y-o-y growth.

- **Global Technology Spending:** Organizations worldwide have been preferring computerization as well as automation to streamline costs and increase operation efficiency, business. Moreover, amidst strict restriction during Covid, business looked technology as a solution to keep the business running and respond to consumer increasingly reliance to several online platform including gaming, digital content, social media, and E-commerce. Consequently, the global IT spending surged to USD 4.4 trillion in 2022. It is further slated to grow by 2.4% to USD 4.5 trillion in 2023. This created great opportunities for the export-oriented Indian IT industry which grew substantially.

- **Preferred Outsourcing Destination:** Indian IT industry has earned more than 25 years of outsourcing experience and possesses a strong ecosystem. Indian companies are steadily upgrading their capabilities to rapidly adapt with emerging demand. With expanding GCC base and tech value proposition, India's continued to ranked 1st as sourcing destination with nearly 60% share in global outsourcing market which witnessed significantly higher growth of 8-10% reaching USD 262 billion in 2022.

- **Growing Technology Absorption in Domestic Market:** While the first phase of India's technology industry development was driven by export of software and services, the current boom is largely led by domestic demand. A major source of growth in domestic IT-BPM revenue has been Government initiatives and technology adoption programmes by government for its citizen and inter-departmental services. Enterprise services comprising of M-wallets/m-banking for financial inclusion; digital marketing; online payments; analytics; automotive (EV/autonomous vehicles); etc. and smart projects comprising of smart city, transportation, utilities buildings, etc., E-commerce.

Domestic IT Spending in India

Market Scenario

The Indian IT sector is experiencing a boom, with overall spending projected to reach a staggering USD138.9 billion in 2024, reflecting a healthy 13.2% growth from 2023. This surge is fueled by a collective increase across all major segments: Data Center Systems, Devices, Software, IT Services, and Communication Services.

Overall India IT Spending (USD Bn)

Year	Spending
2023	122.6
2024P	138.9
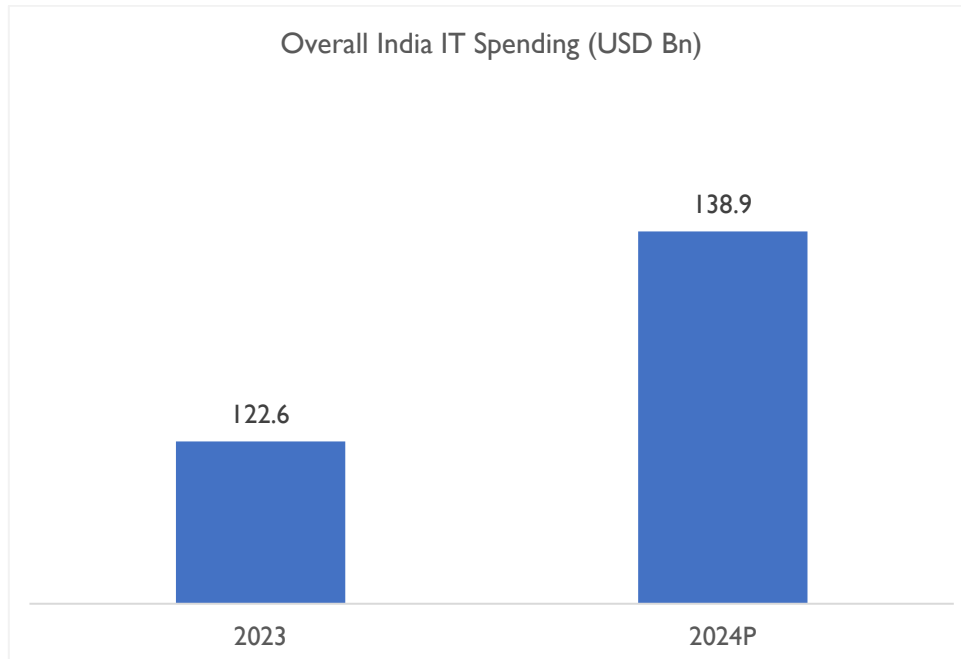
Source: As per Gartner, sourced from public domain

Leading the pack is the software segment, anticipated to witness the highest growth rate of 18.6% in 2024. This can be attributed to factors like rising adoption of cloud-based solutions, increased demand for security software, and the growing importance of enterprise resource planning (ERP) tools. Businesses are actively investing in software that streamlines operations, enhances data management, and fosters innovation. The devices segment is also expected to experience significant growth of 16.9% in 2024. This could be due to a combination of factors such as the need for upgrading to newer devices with better functionalities, and the increasing penetration of smartphones and tablets across various demographics.

India IT Spending across segments (USD Bn)
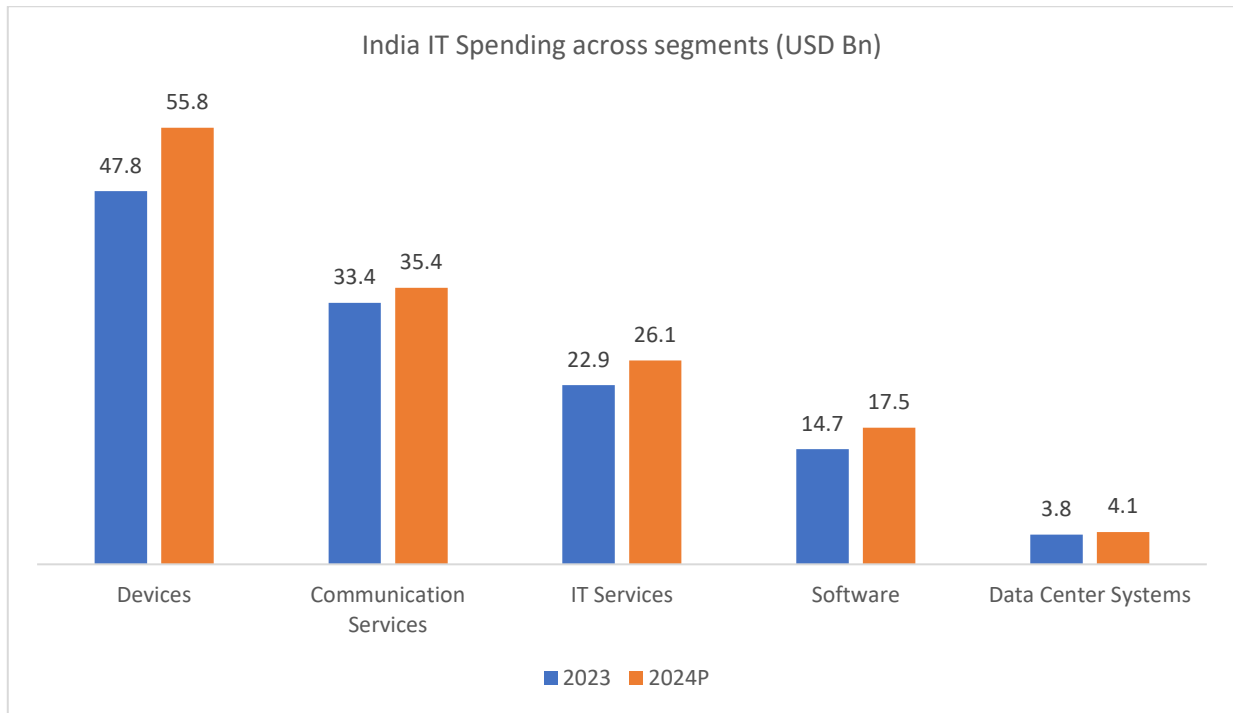
Source: As per Gartner, sourced from public domain

IT services, a major strength of the Indian IT industry, is projected to reach USD 26.1 billion in 2024, reflecting a growth of 14%. This continued growth indicates a strong demand for services like application development, systems integration, and managed IT services. Companies are increasingly outsourcing these tasks to leverage India's skilled workforce and cost-effectiveness. Data center spending is expected to reach USD 4.1 billion in 2024, showing a growth of 9.3%. This growth is likely driven by the expanding need for data storage and processing capabilities as businesses create and manage ever-growing volumes of data. Communication services, though experiencing a slower growth rate of 5.8% compared to other segments, are still expected to reach USD 35.4 billion in 2024. This indicates a steady investment in communication infrastructure, including cloud-based solutions and enhanced bandwidth capabilities, to facilitate seamless information sharing and collaboration in a digital ecosystem.

Market Segmentation

India IT Spending Contribution by Segment, 2024P
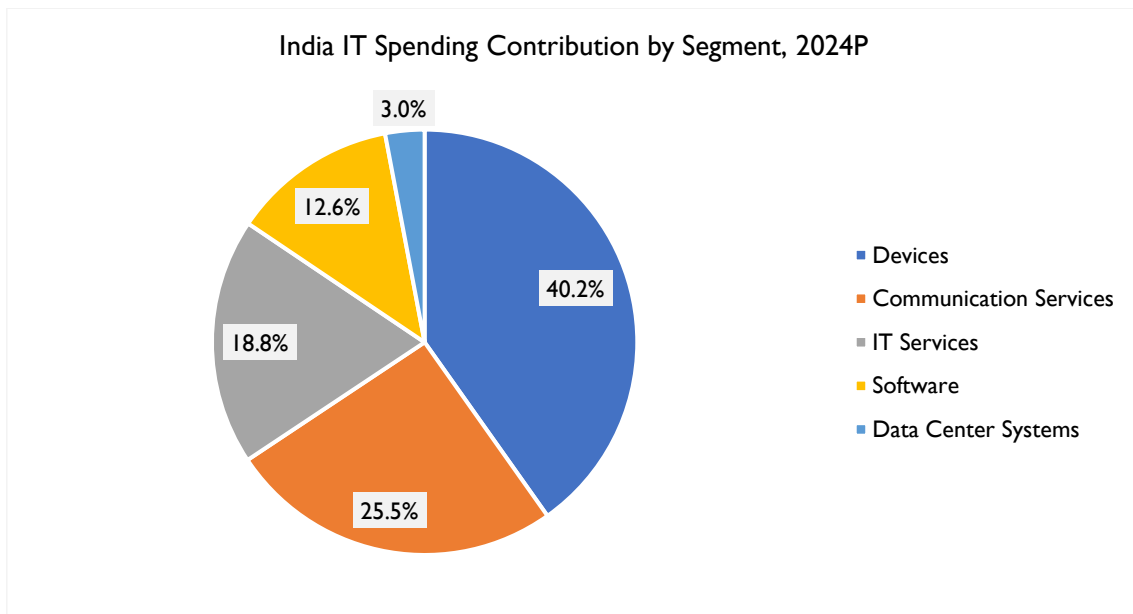
Source: As per Gartner, sourced from public domain

Devices (40.2%) takes the largest share, signifying a significant investment in hardware. This segment likely encompasses expenditures on computers (desktops, laptops), mobile devices (smartphones, tablets), peripherals (printers, scanners), and other endpoint equipment. The high percentage indicates a large and growing need for IT hardware to support digital transformation initiatives across businesses and individuals. Communication Services (25.5%) comes in second, highlighting the importance of robust connectivity. This segment likely covers spending on internet access, data plans, network infrastructure, and potentially cloud communication services. The significant investment reflects the growing importance of reliable and high-speed connectivity for cloud adoption and real-time collaboration. IT Services (18.8%) reflects a strong focus on outsourcing IT operations, system management, and application development. This segment caters to businesses that leverage external expertise to manage their IT needs. Software (12.6%) represents spending on various software applications, including operating systems, enterprise resource planning (ERP) tools, customer relationship management (CRM) software, and industry-specific applications that drive business processes. Data Center Systems (3.0%) constitutes a smaller portion but represents a growing area. As businesses migrate towards cloud computing and data analytics, investments in data center infrastructure and related technologies are expected to rise.

Key factors driving IT spending in India.

Digital Transformation

Digital transformation involves the integration of digital technologies into all aspects of business operations, fundamentally changing how businesses operate and deliver value to customers. Indian businesses are undergoing a significant digital transformation to improve operational efficiency, enhance customer experience, and drive innovation. This transformation involves adopting technologies such as cloud computing, big data analytics, artificial intelligence, machine learning, and IoT to digitize processes, products, and services.

In India, digital transformation initiatives driving IT spending in India are:

Process Automation	• Businesses are automating manual processes and workflows using technologies like robotic process automation (RPA) and business process management (BPM) tools to improve efficiency and reduce errors.
Customer Experience Enhancement	• Companies are leveraging digital channels such as websites, mobile apps, social media, and chatbots to provide seamless and personalized customer experiences. Customer relationship management (CRM) systems are being deployed to better understand customer needs and preferences.
Product and Service Innovation	• Digital technologies such as AI, ML, IoT, and blockchain are enabling the development of innovative products and services. For example, AI-powered chatbots are being used for customer support, while IoT sensors are being deployed for predictive maintenance in manufacturing.
Data-driven Decision-making	• Big data analytics and data visualization tools are helping organizations derive valuable insights from large volumes of data. These insights drive informed decision-making and enable businesses to identify opportunities for growth and optimization.

Thus, businesses are aggressively investing in advanced technologies like cloud computing, AI, IoT, and big data analytics to revolutionize their operations, boost efficiency, and stay ahead in a fiercely competitive market.

Government Initiatives

The Indian government has launched several initiatives to promote digitalization and innovation across various sectors. These initiatives include:

Digital India	• Launched in 2015, the Digital India program aims to transform India into a digitally empowered society and knowledge economy. It focuses on providing digital infrastructure, delivering services electronically, and promoting digital literacy.
Make in India	• The Make in India initiative encourages domestic and foreign companies to manufacture products in India, with a focus on high-tech industries such as electronics, IT, and telecommunications. It aims to boost job creation, foster innovation, and attract investment in manufacturing.
Smart Cities Mission	• The Smart Cities Mission aims to develop 100 smart cities across India by leveraging technology and innovation to improve urban infrastructure, governance, and quality of life. It involves initiatives such as smart transportation, intelligent energy management, and digital governance.
Digital Payments	• The government's push for digital payments through initiatives like Unified Payments Interface (UPI), Bharat Interface for Money (BHIM), and Aadhaar-based payments has accelerated the adoption of digital financial services and e-commerce in India.

These initiatives involve projects such as e-governance, digital infrastructure development, broadband connectivity expansion, and promoting electronic manufacturing. Thus, government initiatives are propelling IT expenditure by spearheading nationwide digitization efforts, upgrading digital infrastructure, expanding connectivity, and fostering innovation-led growth.

Cloud Adoption

Indian businesses are increasingly adopting cloud computing services due to benefits such as scalability, flexibility, cost-effectiveness, and faster time-to-market. Cloud adoption enables organizations to access IT resources on-demand, without the need for significant upfront investment in hardware or infrastructure.

Scalability	• Cloud services allow businesses to scale their IT resources up or down based on demand, eliminating the need for costly infrastructure investments.
Flexibility	• Cloud platforms offer a range of services, including infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS), giving businesses the flexibility to choose the right solutions for their needs.
Cost-effectiveness	• By shifting from a capital expenditure (CapEx) model to an operational expenditure (OpEx) model, businesses can reduce upfront costs and pay only for the resources they consume.
Accessibility	• Cloud services can be accessed from anywhere with an internet connection, enabling remote work and collaboration.

These benefits of cloud adoption are compelling organizations to ramp up IT spending as they transition towards cloud-based solutions to meet evolving business needs.

Data Privacy and Security

With the proliferation of cyber threats and the growing importance of data privacy regulations, Indian organizations are investing in cybersecurity solutions to protect sensitive data and ensure compliance. This includes investments in technologies such as encryption, threat detection and response, and identity and access management (IAM):

Regulatory Compliance	• Organizations need to comply with data protection regulations such as the Personal Data Protection Bill, GDPR, and industry-specific regulations. Non-compliance can result in significant fines and reputational damage.
Data Breach Prevention	• The cost of data breaches continues to rise, prompting businesses to invest in technologies such as encryption, data loss prevention (DLP), and endpoint security to protect sensitive data from unauthorized access and cyber attacks.
Identity and Access Management (IAM)	• IAM solutions help organizations manage user identities and access rights across their IT infrastructure, ensuring that only authorized users have access to sensitive data and resources.

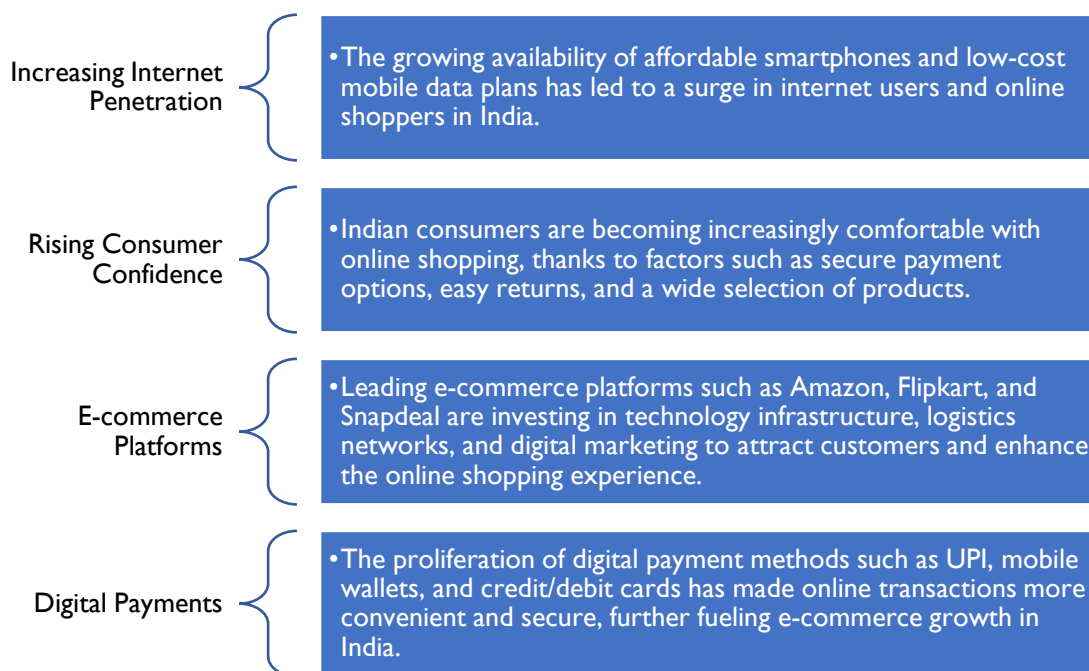Thus, with cybersecurity threats on the rise and stringent regulations in place, businesses are channelling substantial resources into raising up their cybersecurity measures, ensuring data protection, and maintaining compliance, thus driving IT spending.

E-commerce Boom

India's booming e-commerce market is driving IT spending as businesses invest in e-commerce platforms, digital marketing, logistics management, and customer relationship management (CRM) systems. India's e-commerce market has witnessed rapid growth in recent years, driven by factors such as:

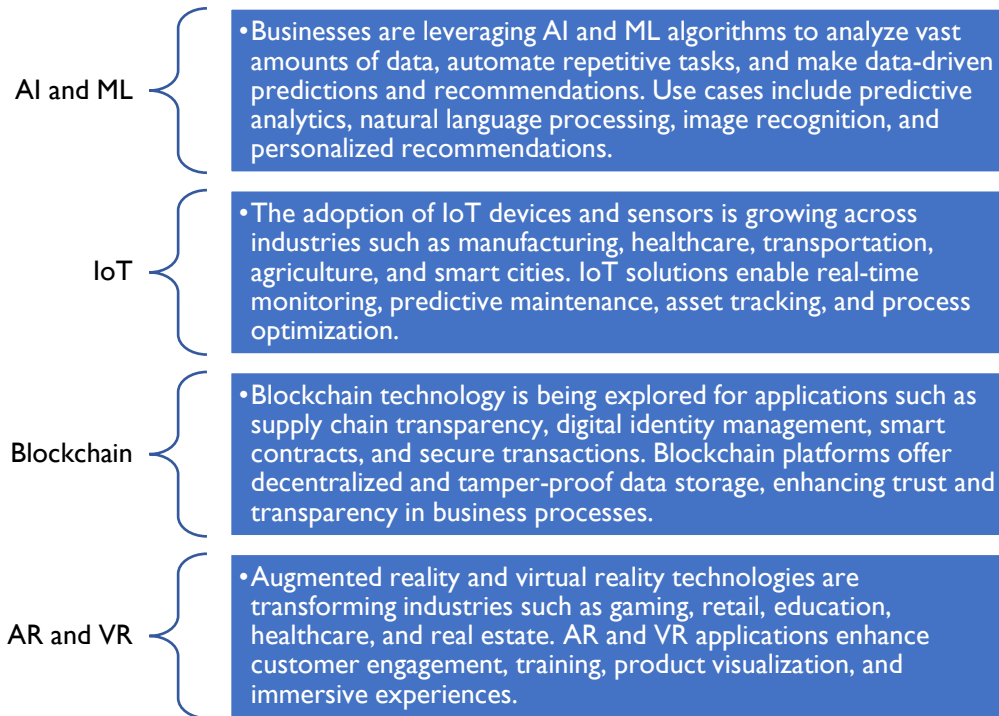| Increasing Internet Penetration	• The growing availability of affordable smartphones and low-cost mobile data plans has led to a surge in internet users and online shoppers in India.
Rising Consumer Confidence	• Indian consumers are becoming increasingly comfortable with online shopping, thanks to factors such as secure payment options, easy returns, and a wide selection of products.
E-commerce Platforms	• Leading e-commerce platforms such as Amazon, Flipkart, and Snapdeal are investing in technology infrastructure, logistics networks, and digital marketing to attract customers and enhance the online shopping experience.
Digital Payments	• The proliferation of digital payment methods such as UPI, mobile wallets, and credit/debit cards has made online transactions more convenient and secure, further fueling e-commerce growth in India.

With the explosive growth of e-commerce in India, businesses are doubling down on IT investments to bolster their online presence, enhance customer experiences, optimize logistics, and scale their operations to capitalize on the booming digital marketplace.

Emerging Technologies

Indian businesses are increasingly exploring emerging technologies such as artificial intelligence, machine learning, Internet of Things, blockchain, and augmented reality to drive innovation and gain a competitive edge. These technologies are being used in various industries, including healthcare, finance, manufacturing, retail, and agriculture, to automate processes, improve decision-making, and create new business models.

AI and ML
- Businesses are leveraging AI and ML algorithms to analyze vast amounts of data, automate repetitive tasks, and make data-driven predictions and recommendations. Use cases include predictive analytics, natural language processing, image recognition, and personalized recommendations.

IoT
- The adoption of IoT devices and sensors is growing across industries such as manufacturing, healthcare, transportation, agriculture, and smart cities. IoT solutions enable real-time monitoring, predictive maintenance, asset tracking, and process optimization.

Blockchain
- Blockchain technology is being explored for applications such as supply chain transparency, digital identity management, smart contracts, and secure transactions. Blockchain platforms offer decentralized and tamper-proof data storage, enhancing trust and transparency in business processes.

AR and VR
- Augmented reality and virtual reality technologies are transforming industries such as gaming, retail, education, healthcare, and real estate. AR and VR applications enhance customer engagement, training, product visualization, and immersive experiences.

The race to harness the power of emerging technologies like AI, ML, blockchain, and AR is pushing organizations to allocate significant budgets towards innovation initiatives, research, and development to unlock new possibilities and drive digital transformation.

Private sector spending

In recent years, India's corporate sector has embarked on a transformative journey driven by IT modernization and digital transformation. This paradigm shift has been catalyzed by rapid technological advancements, changing consumer behaviours, and evolving market dynamics. As organizations across various industries strive to stay competitive and relevant in an increasingly digital world, the adoption of innovative technologies and digital strategies has become imperative.

The digital era has ushered in a new wave of transformation, reshaping traditional business models and revolutionizing industry landscapes. Digital transformation encompasses the integration of digital technologies across all aspects of business operations, including customer engagement, product development, supply chain management, and workforce collaboration. In India, digital transformation has emerged as a strategic imperative for organizations seeking to enhance agility, drive innovation, and deliver superior customer experiences in a rapidly evolving marketplace.

Several key factors are driving the push towards IT modernization in India's corporate sector:
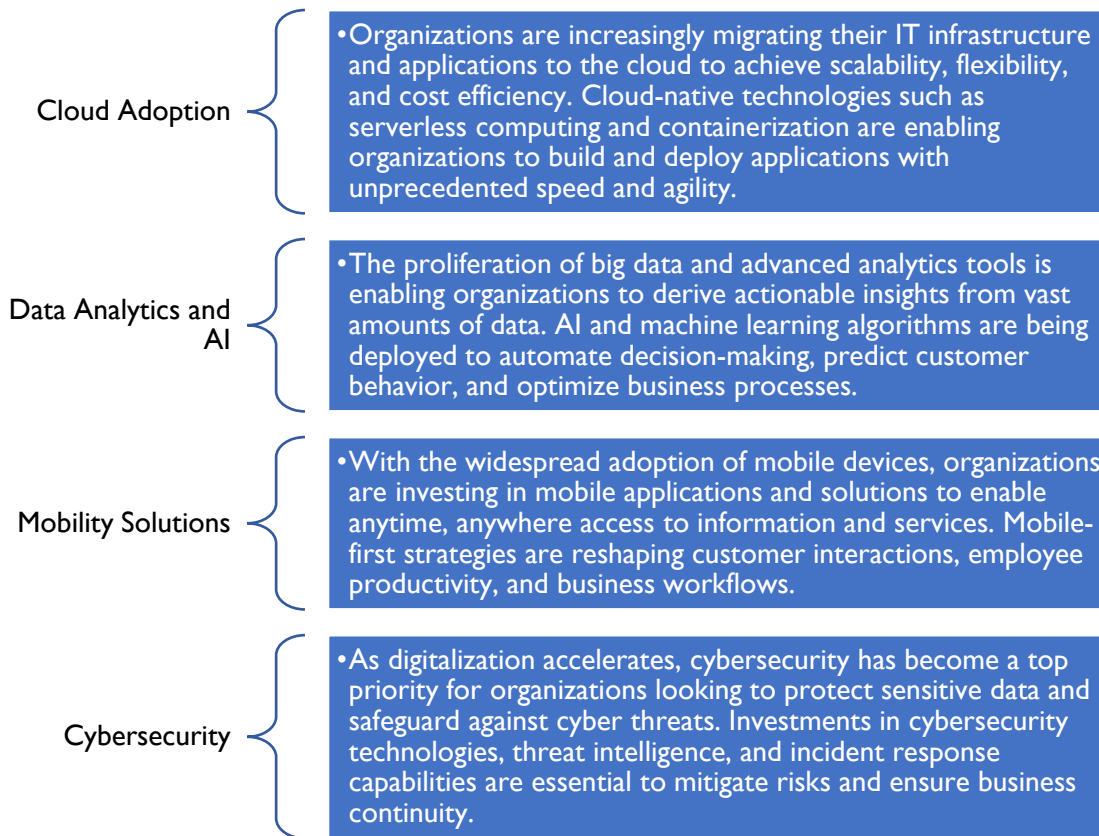
- Technological Innovation: The relentless pace of technological innovation, fuelled by advancements in cloud computing, artificial intelligence, machine learning, and data analytics, is empowering organizations to reimagine business processes and unlock new opportunities for growth and efficiency.

- Changing Consumer Expectations: Today's consumers demand seamless, personalized, and convenient experiences across digital channels. Organizations are under pressure to adapt to these changing expectations by leveraging digital technologies to deliver exceptional customer experiences.

- Competitive Pressures: Intense competition in domestic and global markets is compelling organizations to embrace digital transformation as a means of gaining a competitive edge. Businesses that fail to innovate and modernize risk being left behind in an increasingly digital marketplace.

Key Trends

A variety of initiatives and trends are shaping the landscape of IT modernization and digital transformation in India's corporate sector:

Cloud Adoption	• Organizations are increasingly migrating their IT infrastructure and applications to the cloud to achieve scalability, flexibility, and cost efficiency. Cloud-native technologies such as serverless computing and containerization are enabling organizations to build and deploy applications with unprecedented speed and agility.
Data Analytics and AI	• The proliferation of big data and advanced analytics tools is enabling organizations to derive actionable insights from vast amounts of data. AI and machine learning algorithms are being deployed to automate decision-making, predict customer behavior, and optimize business processes.
Mobility Solutions	• With the widespread adoption of mobile devices, organizations are investing in mobile applications and solutions to enable anytime, anywhere access to information and services. Mobile-first strategies are reshaping customer interactions, employee productivity, and business workflows.
Cybersecurity	• As digitalization accelerates, cybersecurity has become a top priority for organizations looking to protect sensitive data and safeguard against cyber threats. Investments in cybersecurity technologies, threat intelligence, and incident response capabilities are essential to mitigate risks and ensure business continuity.

Digital Transformation Initiatives Driving Growth in the Corporate Sector of India

Digital transformation has become a cornerstone of growth and innovation for the corporate sector in India. Fuelled by technological advancements and changing market dynamics, organizations across industries are embracing digital initiatives to enhance efficiency, agility, and customer-centricity. Given below are the key digital transformation initiatives driving progress in India's corporate sector:

E-commerce and Omnichannel Strategies:

With the proliferation of smartphones and internet connectivity, e-commerce has emerged as a pivotal driver of digital transformation in the corporate sector of India. Organizations are investing in robust e-commerce platforms and omnichannel strategies to reach customers across multiple touchpoints seamlessly. From online marketplaces to mobile applications, companies are leveraging digital channels to enhance customer engagement, drive sales, and build brand loyalty.

Cloud Computing and Infrastructure Modernization:

Cloud computing has revolutionized the way businesses manage and deploy IT infrastructure, enabling scalability, flexibility, and cost efficiency. Organizations in India are migrating their workloads to cloud

platforms such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform to streamline operations, accelerate innovation, and drive digital transformation. By leveraging cloud-native technologies, companies can modernize their IT infrastructure, improve agility, and unlock new capabilities for growth.

Data Analytics and Business Intelligence:

Data has emerged as a strategic asset for organizations seeking to gain actionable insights and make informed decisions. Digital transformation initiatives in India's corporate sector include investments in data analytics and business intelligence tools to harness the power of data. From predictive analytics to real-time dashboards, companies are leveraging advanced analytics techniques to uncover trends, identify opportunities, and drive operational efficiency. Data-driven decision-making is becoming increasingly central to business strategies, enabling organizations to stay competitive in a rapidly evolving marketplace.

Artificial Intelligence and Machine Learning:

Artificial intelligence (AI) and machine learning (ML) are transforming business processes and customer experiences across industries. In India, organizations are leveraging AI and ML technologies to automate repetitive tasks, personalize customer interactions, and optimize operations. From chatbots and virtual assistants to predictive maintenance and fraud detection, AI-powered solutions are driving efficiency, innovation, and value creation. By harnessing the power of AI and ML, companies can unlock new revenue streams, improve productivity, and deliver superior customer experiences.

Cybersecurity and Risk Management:

As digitalization accelerates, cybersecurity has become a top priority for organizations looking to protect their assets, data, and reputation. Digital transformation initiatives in India's corporate sector include investments in cybersecurity solutions and risk management frameworks to mitigate threats and vulnerabilities. From network security and endpoint protection to threat intelligence and incident response, companies are adopting a proactive approach to cybersecurity to safeguard against cyber-attacks and data breaches. By implementing robust security measures and fostering a culture of cybersecurity awareness, organizations can build trust with customers, partners, and stakeholders.

IT Infrastructure Industry

The IT industry plays a pivotal role in driving India's overall economic growth. The industry contributed 7.5% to India's GDP in FY 2023, up from 7.4% in FY 2022. The IT industry added an impressive 3.2 lakh new jobs in FY 2023, taking the total workforce to 5.72 million people.

IT infrastructure services provide the foundation for India's digital transformation by building and managing data centers, networks, and cloud platforms. This ensures ubiquitous internet access, critical for connecting citizens, businesses, and government entities. Reliable and secure IT infrastructure facilitates the adoption of digital technologies like cloud computing, AI, and IoT across sectors like healthcare, education, banking, and agriculture. This translates to improved efficiency, transparency, and innovation within these sectors.

Government initiatives like Digital India rely heavily on robust IT infrastructure for delivering citizen-centric services like e-KYC, e-payments, and online education platforms.

Key Segments

Workplace Services:

The workplace services segment within the IT infrastructure sector goes beyond just maintaining and managing technology within an organization's physical space. It encompasses a comprehensive approach to supporting an increasingly complex and digital work environment. The workplace is evolving rapidly, with remote and hybrid work models becoming increasingly common. This demands flexible and scalable workplace services that cater to a distributed workforce. Cloud-based solutions are gaining traction in workplace services, providing cost-effectiveness, accessibility, and improved collaboration capabilities. Workplace services are no longer siloed but are increasingly integrated with broader business objectives, focusing on user experience, productivity, and overall employee engagement.

Key Services and Trends:

- End-user Support: Evolving from traditional helpdesks to self-service portals and AI-powered chatbots for faster and more personalized assistance.

- Network and Security Management: Emphasis on proactive monitoring, threat detection, and zero-trust security models to ensure data protection and compliance.

- Mobility Management: Managing diverse device types, securing access to corporate resources, and facilitating secure mobile productivity tools.

- Unified Communications and Collaboration: Integrating voice, video, and data tools for seamless communication and collaboration across locations and devices.

- Workplace Automation: Automating routine tasks like device provisioning, password resets, and patching vulnerabilities for improved efficiency and reduced downtime.

- Digital Workspace Management: Providing a personalized and secure digital workspace with access to applications, data, and tools based on individual roles and needs.

- Workplace Analytics: Utilizing data insights to optimize IT services, improve user experience, and identify areas for cost reduction.

Data Security:

Data security plays a critical role in today's digital landscape, safeguarding sensitive information from ever-evolving threats. This segment within IT infrastructure focuses on protecting data from unauthorized access, use, disclosure, disruption, modification, or destruction. Cybercriminals are constantly evolving their tactics, making data security an ongoing challenge. This necessitates staying updated on the latest threats and adopting a layered security approach. Data privacy regulations like GDPR and CCPA are becoming increasingly stringent, demanding robust data protection measures. The growing adoption of cloud services introduces new security considerations, requiring securing data across on-premises and cloud environments.

Key Services and Trends:

- Network Security: Implementing firewalls, intrusion detection/prevention systems (IDS/IPS), and vulnerability management solutions to protect networks from unauthorized access and malicious activity.

- Endpoint Security: Deploying antivirus, anti-malware, and endpoint detection and response (EDR) solutions to secure individual devices from malware and intrusions.

- Identity and Access Management (IAM): Establishing robust IAM practices including multi-factor authentication and role-based access control to ensure only authorized users can access specific data and systems.

- Data Encryption: Encrypting data at rest and in transit using industry-standard algorithms to protect its confidentiality even if compromised.

- Data Backup and Recovery: Implementing comprehensive backup and recovery strategies to ensure data can be restored quickly and efficiently in case of disasters or cyberattacks.

- Cloud Security: Utilizing cloud-specific security solutions like cloud access security brokers (CASBs) and data loss prevention (DLP) to secure data in cloud environments.

- Security Information and Event Management (SIEM): Using SIEM tools to aggregate and analyze security data from various sources, identifying potential threats and providing insights for improved security posture.

Physical infrastructure/data Center services:

The physical infrastructure/data center services segment forms the backbone of the IT infrastructure sector. It focuses on providing the physical foundation and associated services to house and manage the critical IT equipment that powers our digital world.

Services and Solutions:

Colocation: Organizations rent space and power within a data center provider's facility to house their IT equipment. This offers cost-efficiency, scalability, and access to advanced infrastructure.

Managed Hosting: Service providers manage and maintain IT infrastructure on behalf of an organization, including servers, storage, network equipment, and operating systems. This frees up internal resources and expertise.

Disaster Recovery: Providers offer backup data centers and infrastructure to ensure business continuity in case of outages or disruptions at the primary location.

Cloud Data Center Services: This encompasses various cloud deployment models (public, private, and hybrid) where infrastructure elements like servers, storage, and networking are delivered as a service.

Edge Computing Services: Infrastructure deployed closer to where data is generated (e.g., factory floor, retail store) to process and analyze data locally, minimizing latency and improving performance.

Trends Shaping the Segment:

- Hyperscale Data Centers: Growing demand for large, scalable data centers capable of supporting massive computing workloads, often driven by cloud providers and large enterprises.

- Edge Computing Adoption: The rise of IoT and real-time applications necessitates processing data closer to its source, leading to increased adoption of edge computing services.

- Green and Sustainable Data Centers: Growing focus on reducing the environmental impact of data centers through energy-efficient technologies, renewable energy sources, and innovative cooling solutions.

IT Infrastructure Management Services

IT Infrastructure Management Services (IMS) encompass a range of services focused on the planning, design, implementation, operation, and ongoing management of an organization's IT infrastructure. This includes hardware, software, networks, data centers, and the associated processes necessary to deliver reliable and efficient IT services. IMS are critical for ensuring the smooth operation, security, and optimization of the technical backbone that supports businesses in India's rapidly expanding digital economy.

Key Offerings	
Managed Data Center Services	• Colocation: Renting space and power in a data center to house IT equipment. Provides robust physical infrastructure and security. • Managed Hosting: Outsourcing the entire management of servers, storage, and networking equipment to a service provider. • Disaster Recovery as a Service (DRaaS): Backup and recovery sites, often in the cloud, to facilitate business continuity during unexpected disruptions.
Network Management Services	• Network Operations Center (NOC): Real-time monitoring, troubleshooting, and optimization of network performance and availability. • SD-WAN Management: Software-defined wide area network solutions for improved network flexibility and cost optimization. • Managed Security: Firewall management, intrusion detection, and security information and event management (SIEM) to protect networks from threats.
Cloud Infrastructure Services	• Infrastructure as a Service (IaaS): Provisioning of virtualized compute, storage, and network resources on demand. • Platform as a Service (PaaS): Cloud-based platforms for software development and deployment. • Software as a Service (SaaS): Cloud-delivered applications accessible over the internet. • Cloud Migration and Management: Assisting businesses to move workloads and applications to the cloud, along with ongoing optimization.

Endpoint Management Services	• Desktop and Laptop Management: Centralized management of PCs and laptops, covering software distribution, patching, and configuration.
	• Mobile Device Management (MDM): Securing and managing mobile devices (smartphones, tablets) used for business purposes.
	• Helpdesk and Support: Providing technical support to end-users for a wide range of hardware and software issues

Transition in IT Infrastructure Industry

Cloud computing has revolutionized the way businesses manage their IT infrastructure. The shift from traditional on-premises setups to cloud-based models has fundamentally altered how IT resources are provisioned, managed, and consumed.

Traditional Hardware-Dominated Infrastructure

- Capital Expenditure (CapEx) model: Businesses had to invest heavily in procuring and maintaining physical IT infrastructure, including servers, storage, networking equipment, and data centers.

- Capacity Planning: Organizations needed to forecast their future needs, often overprovisioning resources to handle peak demand, leading to underutilized capacity.

- In-House Management: IT teams were responsible for the entire hardware and software lifecycle – procurement, deployment, maintenance, upgrades, and troubleshooting.

- Limited Scalability: Scaling IT resources up or down to match changing needs was often a time-consuming and expensive process.

- Security & Compliance Challenges: Ensuring robust security and meeting compliance standards in a traditional on-premises environment could be complex and demanding.

The Rise of Cloud Infrastructure

- Operational Expenditure (OpEx) model: The cloud introduced a pay-as-you-go approach where businesses pay for only the computing resources they use, converting IT costs into operational expenses.

- On-Demand Provisioning: Businesses can quickly provision resources as needed, without upfront investments or capacity planning concerns.

- Managed Services: Cloud providers handle much of the IT infrastructure management, including hardware maintenance, software updates, and security patching, freeing up internal IT resources.

- Rapid Scalability: Cloud infrastructure provides near-instant scalability to accommodate fluctuating workloads, eliminating the need for overprovisioning and supporting business agility.

- Enhanced Security & Compliance: Cloud providers invest heavily in advanced security measures and often offer compliance-ready solutions, easing the burden on organizations.

Driving Factors for Cloud Adoption

- **Cost Savings:** The pay-as-you-go model eliminates significant upfront capital expenditures and reduces ongoing IT management costs.

- **Agility & Flexibility:** Cloud allows businesses to experiment, innovate, and adapt quickly to market demands by readily scaling resources to support growth or new initiatives.

- **Focus on Core Business:** Reduced IT management burden allows organizations to focus on their core competencies and business goals.

- **Accessibility:** Cloud-based resources can be accessed from anywhere, enabling remote work and collaboration.

- **Technological Advancements:** Continuous innovation and improvements in cloud technology, such as microservices and containerization, offer greater flexibility and better performance.

Challenges and Considerations

- **Vendor Lock-in**: Migrating to the cloud can sometimes create potential dependency on a specific cloud provider, making switching difficult.

- **Security & Privacy Concerns:** While cloud providers implement robust security measures, some organizations still have reservations about storing sensitive data in the cloud.

- **Regulatory Compliance:** Understanding and adhering to compliance requirements specific to the cloud and the industry is crucial.

- **Hybrid Cloud Landscapes:** Many organizations adopt a hybrid cloud approach, blending on-premise infrastructure with cloud services, leading to increased complexity.

Opportunities Emerging in Indian IT Infrastructure Industry

Start-Up Segment and its Impact in IT Infrastructure Industry

India has emerged as a hub for technology start-ups in recent years, with a growing ecosystem fostering innovation and entrepreneurship. This surge in start-up activity has not only transformed the business landscape but also significantly impacted the IT infrastructure industry.

India's technology start-up ecosystem has witnessed exponential growth fuelled by factors such as increasing internet penetration, availability of skilled talent, supportive government policies, and access to venture capital funding. Start-ups across various sectors including e-commerce, fintech, healthtech, edtech, and SaaS have proliferated, leveraging technology to address diverse market needs.

The exponential growth of India's technology start-up ecosystem can be attributed to several key factors:

- Increasing Internet Penetration: According to TRAI, India witnessed a substantial increase in internet subscribers, reaching 1,181.13 million by September 2023. This rise in internet connectivity has facilitated greater access to digital services, driving demand for innovative tech solutions.

- Abundance of Skilled Talent: India's vast pool of skilled talent, particularly in the fields of technology, engineering, and business, has been instrumental in fueling the growth of technology start-ups. The availability of qualified professionals has enabled start-ups to build robust teams and drive innovation across various sectors.

- Supportive Government Policies: The Indian government has introduced several initiatives and policies to support the growth of the start-up ecosystem, including Startup India, Make in India, and Digital India. These initiatives provide incentives, funding support, and regulatory frameworks to nurture and promote entrepreneurial ventures.

- Access to Venture Capital Funding: India has emerged as a lucrative destination for venture capital investment, attracting significant funding from domestic and international investors. According to S&P Global Market Intelligence, India ranked fourth globally in terms of venture capital investment, with the financial technology sector leading the funding charts.

India's start-up landscape is home to more than 100,000 start-ups, with a capital infusion exceeding an impressive $146 billion between 2014 and 2023. This substantial investment signifies a strong financial bedrock for fostering innovation and expansion. Additionally, the presence of over 20,000 active start-up investors and 112 unicorns, collectively valued at over $500 billion, firmly establishes India as a leading global hub for entrepreneurial ventures. Factors that show the remarkable growth and potential of India's technology start-up ecosystem are:

- Global Attraction: India's prominence as a global start-up destination is evident, with the country capturing 4.2% of global venture capital investments, securing its position as the fourth-most popular destination for start-ups worldwide in 2022.

- Resilient Growth: Despite global economic challenges, India witnessed a record-breaking 26,542 startup registrations in 2022, underscoring the resilience and dynamism of the start-up landscape.

- Expansive Ecosystem: With over 92,000 recognized start-ups as of February 2023, India boasts a diverse and expansive entrepreneurial ecosystem, fostering innovation across various sectors.

- Funding Dynamics: The financial technology sector has emerged as a frontrunner in funding, attracting a cumulative $9.7 billion in investments in 2021 and 2022, signalling investor confidence and market potential.

- Future Projections: Projections indicate a significant growth trajectory, with the number of tech start-ups expected to soar from 68,000 in 2023 to 1.8 lakh by 2030, promising abundant opportunities for innovation, job creation, and economic growth.

Impact on the IT Infrastructure Industry:

The rapid proliferation of technology start-ups has led to a surge in demand for robust IT infrastructure solutions. This demand is driven by several factors:

1. Cloud Adoption: Start-ups, particularly those operating in the software-as-a-service (SaaS) domain, rely heavily on cloud computing for scalability, flexibility, and cost-efficiency. This has led to a significant increase in demand for cloud infrastructure services, prompting cloud providers to expand their data center footprint in India.

2. Edge Computing: With the proliferation of IoT devices and the need for real-time data processing, edge computing has gained prominence. Start-ups leveraging IoT, AI, and machine learning require edge infrastructure to process data closer to the source, leading to investments in edge computing solutions.

3. Cybersecurity: As start-ups handle sensitive customer data and intellectual property, cybersecurity has become a top priority. This has resulted in increased investments in cybersecurity infrastructure, including firewalls, threat detection systems, and encryption technologies.

4. Data Analytics: Start-ups are increasingly relying on data analytics to gain actionable insights and drive decision-making. This has spurred demand for infrastructure capable of handling large volumes of data and performing complex analytics tasks, leading to investments in big data platforms and analytics tools.

5. DevOps and Automation: Start-ups prioritize agility and rapid product development, driving the adoption of DevOps practices and automation tools. This has led to investments in infrastructure automation, continuous integration/continuous deployment (CI/CD) pipelines, and containerization technologies.

6. Remote Work Infrastructure: The COVID-19 pandemic accelerated the adoption of remote work practices, prompting start-ups to prioritize remote-friendly infrastructure solutions. This includes robust networking infrastructure to support remote collaboration tools, virtual private networks (VPNs) for secure access to company resources, and cloud-based communication platforms. As start-
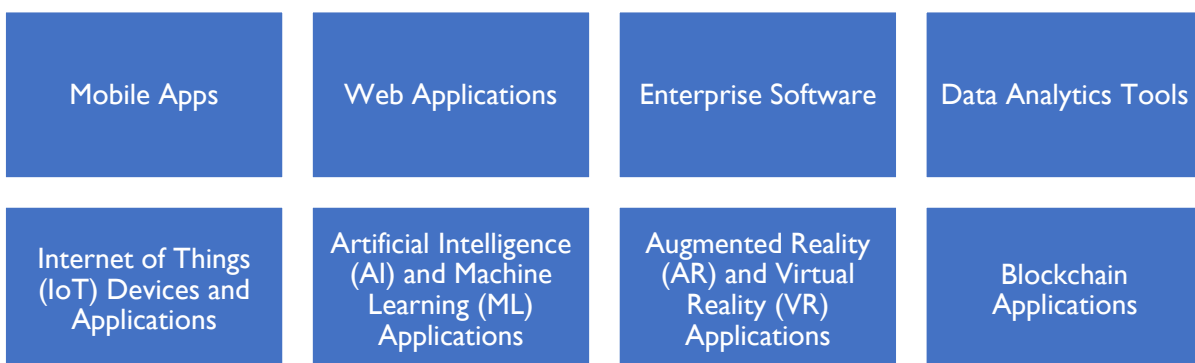
ups continue to embrace remote work as a permanent or hybrid model, there is a growing demand for infrastructure solutions that enable seamless remote operations while ensuring data security and employee productivity. This shift towards remote work infrastructure presents both opportunities and challenges for the IT infrastructure industry, driving innovation in areas such as remote access technologies, virtualization, and endpoint security solutions.

The rise of technology start-ups in India has reshaped the IT infrastructure landscape, driving demand for innovative solutions that can support the dynamic needs of these companies. To capitalize on this trend, IT infrastructure providers must adapt their offerings to cater to the unique requirements of start-ups while addressing challenges such as scalability, cost, talent shortage, and cybersecurity. By embracing innovation and agility, the IT infrastructure industry can effectively support India's thriving start-up ecosystem and contribute to its continued growth and success.

New technology applications and its impact

Technology applications refer to software, tools, platforms, and systems developed to perform specific tasks, solve problems, or meet user needs using technological solutions. These applications leverage various technologies such as software development, hardware integration, data analysis, artificial intelligence, and internet connectivity to deliver value to users and organizations across different domains.

Examples of technology applications include:

Mobile Apps	Web Applications	Enterprise Software	Data Analytics Tools
Internet of Things (IoT) Devices and Applications	Artificial Intelligence (AI) and Machine Learning (ML) Applications	Augmented Reality (AR) and Virtual Reality (VR) Applications	Blockchain Applications

Technology applications are utilized in both consumer and enterprise segments to meet various needs and objectives.

Consumer Segment

- Communication: Consumers use technology applications such as messaging apps, social media platforms, and video conferencing tools for seamless communication and connectivity with friends, family, and peers.

- Entertainment: Streaming services, gaming apps, and virtual reality experiences provide consumers with entertainment and leisure options, enhancing their digital lifestyles.

- E-commerce: Online shopping platforms and mobile payment apps enable consumers to browse, purchase, and pay for products and services conveniently from the comfort of their homes.

- Health and Wellness: Health tracking apps, wearable devices, and telemedicine platforms empower consumers to monitor their health, access medical advice, and engage in fitness activities remotely.
- Personal Finance: Banking apps, budgeting tools, and investment platforms assist consumers in managing their finances, making transactions, and planning for the future.

Enterprise Segment

- Operations Management: Enterprises leverage technology applications such as enterprise resource planning (ERP) systems, inventory management software, and project management tools to streamline operations, optimize workflows, and enhance efficiency.
- Customer Relationship Management (CRM): CRM software enables businesses to manage interactions with customers, track sales leads, and analyze customer data to improve engagement and drive revenue growth.
- Data Analytics: Business intelligence (BI) tools, data visualization platforms, and predictive analytics software help enterprises analyze large volumes of data, gain insights, and make informed decisions to drive business outcomes.
- Collaboration and Communication: Enterprises utilize collaboration tools, video conferencing platforms, and project management software to facilitate teamwork, communication, and collaboration among employees, regardless of location or time zone.
- Marketing and Sales: Marketing automation software, customer relationship management (CRM) platforms, and digital marketing tools assist enterprises in reaching target audiences, generating leads, and driving sales through targeted campaigns and personalized messaging.

In India, there has been a notable surge in the adoption and proliferation of new technology applications across both consumer and enterprise segments. This growth is driven by several factors, including increasing internet penetration, rapid digitalization, and a burgeoning start-up ecosystem.

Consumer Segment

Increased Smartphone Penetration

- India's smartphone penetration has surged due to affordable devices and widespread mobile data availability, leading to increased usage of mobile apps across urban and rural areas. As the world's second-largest smartphone market by active users, India experiences significant growth in mobile app usage, driven by greater affordability and expanding smartphone usage. The COVID-19 pandemic accelerated India's transition to a mobile economy, with businesses embracing digital transactions. The Broadband India Forum projects that the app economy could contribute around 12 percent of India's GDP by 2030, growing four times faster than the wider economy. In 2023, India saw 26.4 billion app downloads and reached one billion smartphone users, representing 48.1% of the population.

Digital Entertainment Boom

- With the advent of streaming platforms, gaming apps, and social media networks, Indian consumers are increasingly turning to digital entertainment options for leisure and recreation. The popularity of platforms like Netflix, Amazon Prime Video, Disney+ Hotstar, and FreeFire highlights the growing appetite for immersive digital experiences.

E-commerce Revolution

- India's e-commerce sector has experienced explosive growth, fuelled by the rise of platforms like Flipkart, Amazon, and Paytm Mall. According to NASSCOM, India's e-commerce market is forecasted to cross a whopping $200 billion by 2030 due to increased analytics, transactions, and internet penetration. Consumers now have access to a wide range of products and services online, driving the adoption of digital payments and contactless shopping experiences.
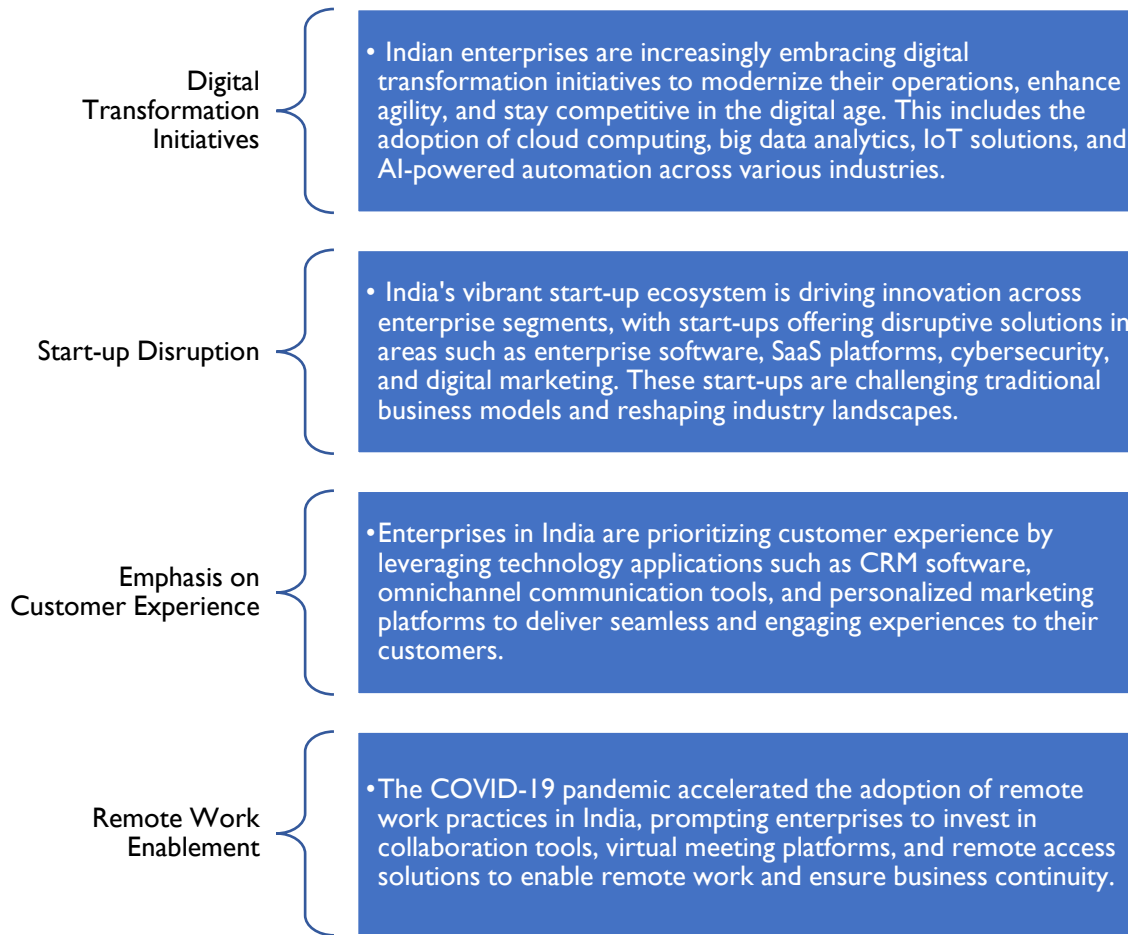
Healthcare Innovation

- Digital health apps, telemedicine platforms, and wearable devices are transforming the healthcare landscape in India, enabling consumers to access medical consultations, track their health metrics, and manage chronic conditions remotely.

Fintech Adoption

- The fintech sector in India has witnessed rapid growth, with consumers embracing digital payment apps, mobile wallets, and investment platforms for seamless financial transactions, savings, and investments.

Enterprise Segment

Digital Transformation Initiatives	• Indian enterprises are increasingly embracing digital transformation initiatives to modernize their operations, enhance agility, and stay competitive in the digital age. This includes the adoption of cloud computing, big data analytics, IoT solutions, and AI-powered automation across various industries.
Start-up Disruption	• India's vibrant start-up ecosystem is driving innovation across enterprise segments, with start-ups offering disruptive solutions in areas such as enterprise software, SaaS platforms, cybersecurity, and digital marketing. These start-ups are challenging traditional business models and reshaping industry landscapes.
Emphasis on Customer Experience	• Enterprises in India are prioritizing customer experience by leveraging technology applications such as CRM software, omnichannel communication tools, and personalized marketing platforms to deliver seamless and engaging experiences to their customers.
Remote Work Enablement	• The COVID-19 pandemic accelerated the adoption of remote work practices in India, prompting enterprises to invest in collaboration tools, virtual meeting platforms, and remote access solutions to enable remote work and ensure business continuity.

The surge in new technology applications, both in consumer and enterprise segments, has significant implications across various aspects of society and the economy. This growth signifies a transformative shift in how individuals and businesses interact, operate, and innovate. Following are the key implications of this phenomenon:

1. Enhanced Consumer Experiences: New technology applications are revolutionizing consumer experiences across industries such as retail, entertainment, healthcare, and transportation. From personalized recommendations and immersive content to convenient digital services and seamless transactions, consumers are benefiting from greater convenience, efficiency, and customization.

2. Empowerment of Businesses: For enterprises, the proliferation of new technology applications presents opportunities to streamline operations, optimize processes, and unlock new revenue streams. From advanced analytics and automation to cloud computing and IoT integration, businesses can leverage technology to enhance productivity, agility, and competitiveness in an increasingly digital marketplace.

3. Disruption and Innovation: The rapid adoption of new technology applications is driving disruption and innovation across traditional industries, challenging existing business models and paving the way for novel approaches to value creation. Start-ups and established companies alike are harnessing

emerging technologies such as artificial intelligence, blockchain, and augmented reality to create innovative solutions that address evolving market demands and customer preferences.

4. Economic Growth and Job Creation: The growth of new technology applications fuels economic growth by stimulating investment, driving productivity gains, and fostering entrepreneurship. As new markets emerge and existing industries evolve, there is a corresponding increase in job opportunities across various skill levels, from software development and data analysis to digital marketing and customer experience management.

5. Societal Impacts: Beyond the economic realm, the proliferation of new technology applications has profound societal implications, influencing how people communicate, collaborate, and interact with the world around them. From the democratization of information and digital inclusion to concerns about privacy, cybersecurity, and ethical use of technology, these developments shape the fabric of society and raise important ethical, legal, and social questions.

The growth of new technology applications represents a paradigm shift in how individuals, businesses, and society as a whole engage with technology and navigate the digital landscape. By understanding and harnessing the potential of these technologies, stakeholders can unlock opportunities for innovation, growth, and positive societal impact in the digital age.

India as a Global Capability Center (GCC) hub & its impact on IT infrastructure spending

In recent years, India has emerged as a key hub for multinational companies establishing their Global Capability Centres (GCCs). With over 1,600 GCCs operating in the country and employing more than 1.6 million people, India's prominence in the global business landscape has significantly grown. This write-up delves into the factors driving this emergence, the evolution of GCCs in India, key industry verticals, growth projections, and the transformative impact on the economy.

Evolution of GCCs in India

The journey of GCCs in India dates back to the 1980s when pioneering companies like Texas Instruments set up their offices in Bengaluru. Originally known as captives or GICs (global in-house centres), these entities have evolved significantly over the years, transitioning into sophisticated GCCs. By 2012, the number of GICs had surpassed 760, and today, India hosts over 1,600 GCCs, a testament to its attractiveness as a strategic destination for global operations.

Several factors contribute to India's appeal as a preferred destination for establishing GCCs:

- Abundance of Skilled Talent: India boasts a vast talent pool of 2.5 million people with diverse skill sets, particularly in software product engineering. This futuristic talent pool is not only technically proficient but also possesses a strong work ethic and innovative mindset, essential for driving business growth and competitiveness.

- Cost-Competitive Operations: India offers competitive operational costs without compromising on quality standards. This cost advantage, coupled with high-quality services, makes it an attractive proposition for multinational companies seeking to optimize their operational expenses.

- Strategic Geographic Location: India's strategic geographic location allows for easy management of satellite operations for neighbouring countries and beyond. This facilitates seamless coordination and enhances operational efficiency for multinational corporations.

- Culture of Innovation: The Indian tech ecosystem is characterized by a culture of innovation, fostering creative problem-solving and adaptability. This culture enables GCCs to drive cutting-edge innovations and stay ahead in today's dynamic business environment.

- Market Access and Growth Opportunities: With a large domestic market and significant opportunities for further growth and market penetration, India provides GCCs with a platform for expanding their business footprint and tapping into diverse market segments.

Key Industry Verticals and Growth Trajectory

GCCs in India operate across various service lines, including IT services, BPO, engineering services, and software product development. Over the years, they have ascended the value chain, delivering complex work that requires a deep understanding of business context and imperatives. Key industry verticals such as banking and financial services, software, telecom, semiconductor, aerospace, automotive, healthcare, and pharma have witnessed substantial growth driven by GCCs' contributions.

In India, several multinational companies have established Global Capability Centres (GCCs) to drive innovation and operational efficiency. Below are examples of three such companies:

AstraZeneca's Virtual Reality Solution: AstraZeneca's Global Innovation and Technology Centre in Chennai showcases the innovative potential of GCCs in India. By leveraging virtual reality (VR) technology, AstraZeneca has developed an immersive digital replica of its drug production facility in Sweden. This virtual environment allows employees to undergo training and familiarize themselves with the production processes without physically being present on the assembly line. Developed entirely by AstraZeneca's captive unit in India, this VR solution not only enhances training effectiveness but also saves the pharmaceutical giant significant costs associated with traditional training methods. By harnessing the technical expertise and innovation capabilities of its GCC in India, AstraZeneca demonstrates how GCCs contribute to driving efficiency, innovation, and cost savings for multinational corporations.

Rakuten Group's Bengaluru GCC: Rakuten Group, a Japanese conglomerate, has established its Global Capability Centre in Bengaluru. This GCC plays a crucial role in developing and managing digital payment platforms, including Rakuten Pay, which is Japan's equivalent of GooglePay. The Bengaluru GCC oversees the entire product lifecycle, from user experience (UX) design to backend development and strategic planning. By leveraging India's vast talent pool and tech expertise, Rakuten Group's GCC has not only created innovative digital payment solutions but also contributed to the company's strategic goals. The success of

Rakuten Pay underscores the pivotal role played by GCCs in driving digital transformation and enhancing customer experiences for multinational corporations.

Lowe's Self-Checkout System: Lowe's, a US-based home improvement retailer, has leveraged its GCC in Bengaluru to develop a robust self-checkout system for its stores. This system, developed in-house at a fraction of the cost of vendor products, has significantly increased the efficiency of transactions at Lowe's stores. With the GCC's expertise in software development and engineering services, Lowe's has successfully implemented innovative solutions to streamline operations and enhance customer satisfaction. The success of the self-checkout system highlights how GCCs in India contribute to driving operational excellence and cost optimization for multinational corporations across diverse industry verticals.

According to projections by NASSCOM, the GCC landscape in India is set to expand further in the coming years. By 2028, the total number of GCCs is expected to surpass 2,100, with revenue exceeding USD 90 billion. Cost savings are no longer the main driving force behind companies' decisions to operate in India. Instead, a combination of skilled talent, a vibrant startup environment, and a digitally savvy industry and customer base is drawing companies to the country.

Impact on IT Infrastructure spending

The emergence of India as a Global Capability Centre (GCC) hub has had a profound impact on IT infrastructure spending, both within the country and globally. This impact can be observed across various dimensions:

- **Increased Investment in IT Infrastructure in India:** As multinational companies establish their GCCs in India, there is a growing need for robust IT infrastructure to support their operations. This includes investments in data centers, networking equipment, cloud computing services, cybersecurity measures, and software development tools. The influx of GCCs has led to a surge in demand for advanced IT infrastructure solutions and services, prompting organizations to allocate significant budgets for infrastructure development and upgrades. According to a collaborative survey conducted by Deloitte and industry association NASSCOM, more than 70 percent of companies with GGCs and engineering service arms in India intend to boost their budgets by 10-25 percent during 2022-23. The survey also highlights that Engineering Research and Development (ER&D) expenditures within the automotive, transportation, and industrial sectors housed in India's GCCs are anticipated to experience the most significant growth, projected to fall within the range of 10-25 percent.

- **Adoption of Emerging Technologies:** GCCs in India often focus on driving innovation and digital transformation within their parent organizations. This entails the adoption and implementation of emerging technologies such as artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), blockchain, and advanced analytics. Consequently, there is a heightened emphasis on investing in IT infrastructure that can support these technologies, including high-performance computing systems, storage solutions, and specialized hardware accelerators.

- E**xpansion of Data Center Footprint:** The growing presence of GCCs in India has led to an expansion of data center infrastructure to accommodate the increasing volume of data generated and processed by these centers. Organizations are investing in building new data centers or expanding existing ones to ensure scalability, reliability, and compliance with regulatory requirements. Additionally, there is a trend towards adopting hybrid and multi-cloud strategies, necessitating investments in cloud infrastructure and management platforms.

- **Focus on Security and Compliance:** With the rising cyber threats and stringent regulatory requirements, there is a heightened focus on enhancing cybersecurity measures and ensuring compliance with data protection regulations. Organizations operating GCCs in India are investing in advanced security solutions such as intrusion detection systems, threat intelligence platforms, encryption technologies, and identity and access management solutions. Moreover, there is an increased emphasis on implementing robust data privacy and compliance frameworks to safeguard sensitive information and mitigate risks.

- **Collaboration and Connectivity Requirements:** The seamless collaboration between GCCs in India and their parent organizations worldwide necessitates investments in robust connectivity infrastructure. This includes high-speed internet connectivity, virtual private networks (VPNs), unified communications platforms, and collaboration tools. Organizations are leveraging technologies such as software-defined networking (SDN) and edge computing to optimize network performance, ensure low-latency communications, and support real-time collaboration across geographically distributed teams.

- **Economic Impact on IT Infrastructure Providers:** The growing demand for IT infrastructure solutions and services driven by the proliferation of GCCs in India presents significant opportunities for IT infrastructure providers, including hardware vendors, cloud service providers, network equipment manufacturers, and cybersecurity firms. These providers stand to benefit from increased demand for their products and services, leading to revenue growth and market expansion.

In conclusion, India's emergence as a GCC hub highlights its growing significance in the global business ecosystem. With a conducive business environment, abundant talent pool, cost-competitive operations, and culture of innovation, India offers a compelling value proposition for multinational companies seeking to establish GCCs. As the GCC landscape continues to evolve and expand, India is poised to remain at the forefront of this transformation, driving economic growth, innovation in Information technology, and market leadership in the years to come.

Evolving data security / cybersecurity landscape and its impact

In recent years, India has witnessed significant changes in its data security and cybersecurity landscape driven by technological advancements, regulatory reforms, and evolving cyber threats. India's digital transformation journey has accelerated, leading to a massive proliferation of data across various sectors such as finance, healthcare, e-commerce, and government services. The widespread adoption of digital technologies, including cloud computing, IoT, and mobile devices, has exponentially increased the volume, velocity, and variety of data being generated, posing new challenges for data security and cybersecurity.

Current Challenges for Organisations in India

- **Rise in Cyberthreats:** The proliferation of cyber threats has surged in the digital era, underscoring the critical importance of cybersecurity. India is confronted with a broad spectrum of cyber threats, ranging from financial fraud and data breaches to sophisticated cyber-espionage campaigns.
- **Diverse Attack Techniques**: Given its expansive population, India has become a focal point for cybercriminals who employ various attack techniques such as phishing, ransomware, and social engineering tactics to exploit vulnerabilities.
- **Targeted Sectors:** Key sectors including financial institutions, e-commerce platforms, and government entities are particularly targeted due to the sensitive nature of their data, amplifying the need for robust cybersecurity measures.
- **Ransomware Surge:** A notable surge in ransomware incidents has resulted in significant disruptions to businesses, lasting from a few days to several weeks, further emphasizing the evolving and pervasive nature of cyber threats.

The IBM Security Data Breach Report of 2022 revealed that the average cost of data breaches in India reached a record high of ₹17.5 crores (₹175 million) rupees, equivalent to around $2.2 million, for the fiscal year of 2022. This marks an increase of 6.6% from the previous year and a staggering 25% rise from the average cost in 2020.

During the first half of the fiscal year 2023-24, the healthcare, education/research, and utilities sectors were the most impacted industries in terms of weekly cyber attacks per organization. Additionally, the retail, hospitality, manufacturing, and transportation sectors are urged to enhance their cybersecurity measures due to increasing threats.

On average, each organization in India experienced 2,157 cyber attacks per week in the last six months, compared to 1,139 attacks per organization globally.

Furthermore, the first half of 2023 witnessed several significant cybersecurity incidents in India, ranging from financial frauds to data breaches. Notably, the Odisha Economic Offenses Wing apprehended 60 fraudsters involved in various online scams that yielded ₹100 crore. The Kangra Co-operative Bank suffered a ₹7.79 crore cyber fraud, emphasizing the urgent need for stronger cybersecurity measures in the banking sector.

In another incident, a major data breach occurred in the Ministry of Health and Family Welfare, where a hacking group known as Phoenix allegedly breached the Health Management Information System, jeopardizing sensitive hospital data nationwide. Concurrently, a scam targeted Indian investors, exploiting the growing popularity of cryptocurrencies. Fake platforms deceived unsuspecting investors into losing over ₹1,000 crore, highlighting the necessity for increased awareness among crypto investors.

Response to Cyberattacks

Amidst the rising tide of cyber threats, India's cybersecurity landscape is witnessing a robust response, with various stakeholders including businesses, individuals, and governmental bodies collaborating to fortify their digital defenses.

A notable initiative involves the collaboration between national security agencies and the Defence Cyber Agency, engaging in rigorous cyber defense exercises to enhance preparedness and resilience. Additionally, the Union Home Ministry has established a dedicated helpline to assist individuals affected by cyber scams, aiming to swiftly block stolen funds, refund victims within 24 hours, and raise awareness about the importance of safeguarding sensitive information online.

In August 2023, the government enacted the Digital Personal Data Protection (DPDP) Act, 2023, a landmark cross-sectoral legislation aimed at safeguarding personal data amidst concerns of heightened surveillance. This legislative milestone has bolstered confidence among multinational corporations operating in India.

Further demonstrating proactive measures, initiatives like the National Counter Ransomware Task Force underscore India's commitment to countering specific threats like ransomware. Collaborative efforts, such as the formation of the International Counter Ransomware Task Force, exemplify India's willingness to collaborate globally for enhanced cybersecurity.

Concurrently, Indian businesses and individuals are taking proactive steps against cyber threats by enrolling in online courses offered by institutions like the Defence Research and Development Organisation, focusing on cybersecurity and AI education to bolster their expertise.

The deployment of innovative tools such as USB Pratirodh and AppSamvid, aimed at providing enhanced control and protection against malware, reflects India's tech-driven approach to cybersecurity. Additionally, breakthrough solutions like the Artificial Intelligence and Facial Recognition-powered Solution for Telecom SIM Subscriber Verification (ASTR) showcase India's technological advancements in combatting fraudulent activities in the cybersecurity domain.

Impact on IT Sector

Increased Spending on IT Infrastructure

With the escalating cyber threats, organizations are compelled to invest more in strengthening their IT infrastructure to safeguard against potential breaches and cyber attacks. This surge in spending on IT infrastructure encompasses the implementation of robust cybersecurity measures, including advanced threat detection systems, encryption technologies, and secure network architecture.

Growing Demand for Cybersecurity Solutions and Services:

The heightened awareness of cybersecurity risks has fuelled a surge in demand for cybersecurity solutions and services across various industries. This increased demand encompasses a wide range of cybersecurity offerings, including threat intelligence platforms, endpoint security solutions, penetration testing services, and security consulting services. As a result, cybersecurity providers are witnessing a significant uptick in business opportunities and revenue growth.

Rise in Cybersecurity Jobs and Skill Development:

The evolving cybersecurity landscape has created a growing demand for skilled professionals capable of combating sophisticated cyber threats. Consequently, there is a surge in cybersecurity job opportunities across the country, ranging from cybersecurity analysts and engineers to ethical hackers and incident responders. This increased demand for cybersecurity talent has prompted organizations and educational institutions to invest in cybersecurity training and skill development programs to bridge the skills gap and groom the next generation of cybersecurity professionals.

Emphasis on Regulatory Compliance and Data Protection:

The enactment of regulatory reforms such as the Digital Personal Data Protection (DPDP) Act, 2023, has heightened the focus on regulatory compliance and data protection among organizations operating in India. Companies are now mandated to adhere to stringent data protection requirements and implement comprehensive data security measures to ensure compliance with regulatory standards. This emphasis on regulatory compliance has spurred investments in data protection technologies and compliance frameworks to mitigate regulatory risks and safeguard sensitive customer information.

Rise in Cyber Insurance Adoption:

As organizations recognize the financial implications of cyber incidents, there is a growing trend towards the adoption of cyber insurance policies to mitigate the financial impact of cyber attacks and data breaches. Cyber insurance policies provide organizations with financial protection against the costs associated with data breaches, including legal expenses, regulatory fines, and incident response costs. This rise in cyber insurance adoption reflects a proactive approach towards managing cyber risks and enhancing financial resilience in the face of cyber threats.

Government Spending on Information Technology

Annual spending by Indian Government on IT is estimated to have reached USD 11.6 billion in 2023, increasing by nearly 10.2% over previous year. Despite the signs of contraction in technology spending in private sector, spending trend in public domain is showing signs of resilience. The positive trend in IT spending in public space is driven by two key factors – IT modernization initiatives and digitization measures to improve productivity. This is in line with the trend seen in Government spending across the world, with investments in application modernization driving the spending.
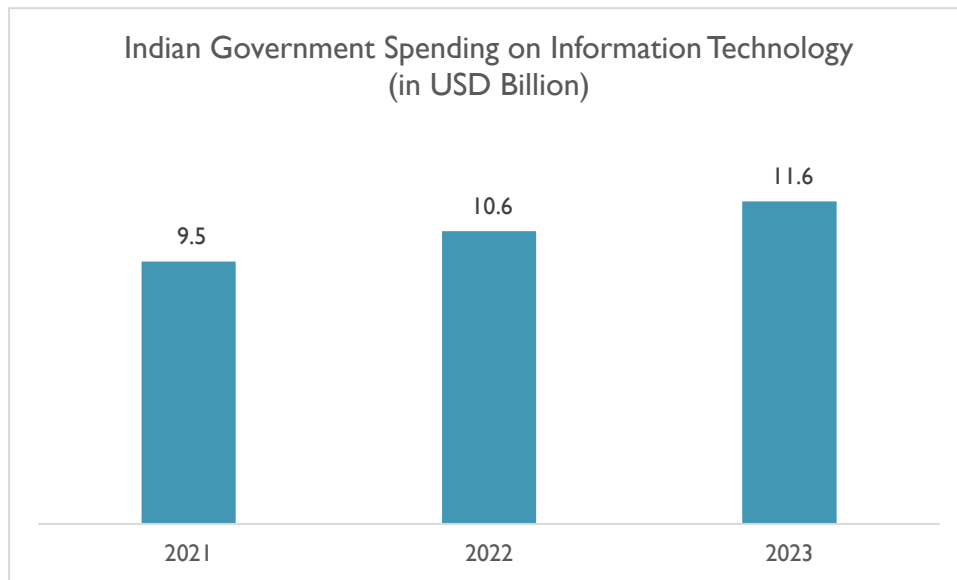
Source: Gartner, IDC

Specific to Indian Government, the focus is on providing a unified digital experience and a mobile first experience. Schemes like Unified Mobile Application for New-Age Governance (UMANG), Open Government Data Platform (OGDP) and IndiaStack are designed to achieve this objective. Among these, the IndiaStack program is focused on creating a unified software platform to fast track the digital journey of Indian population. IndiaStack has five programs: Aadhar, e-KYC, e-Signature, Digital Locker, and Unified Payment Interface (UPI). These five programs together are transforming the digital landscape in India.

IT Modernization Journey in Indian Public Domain

2006 – 2010	Early Initiatives & Foundation Building	Launch of National e-Governance Plan (NeGP) to improve Government services through integration of IT. Introduction of MeghRaj initiatives – National Cloud Computing Infrastructure
2011-2015	Transition to Digital Platform	Launch of Digital India campaign Introduction of Aadhaar program

2016 – 2020	Accelerated Modernization & Integration of Emerging Technologies	Implementation of GST, and subsequently the creation of GST Network (GSTN)
		Cloud adoption gains momentum
		National Artificial Intelligence Strategy to promote responsible & ethical use of AI
2021 – 2024	Focus on digital inclusion & citizen centric services	Expansion of broadband connectivity, promoting digital inclusion in rural areas.

Government Flagship Digital Policies

While digitization of common citizen services has improved operational efficiencies as well as service delivery, it has generated massive data necessitating the requirement for a robust and flexible digital infrastructure. Subsequently the Government has scaled up its spending and budgetary allocation towards digital infrastructure updation, and adoption of cloud infrastructure.

Digital India Initiative

The Digital India program has spurred the development of citizen-centric applications like CoWIN and DigiLocker, emphasizing innovation, service quality, and operational efficiency. These apps have led to increased data generation and the need for flexible, scalable solutions. These solutions have significantly impacted vaccination distribution, worker registration, and document issuance, showcasing the tangible benefits of cloud technology adoption.

The scheme launched in 2015 is an umbrella program which covers programs including Aadhaar, country-wide rural broadband connectivity, common service centers, Bharat Interface for Money (BHIM), Aadhar enabled payment system, and MyGov program.

The Union Government in August 2023 approved the extension of Digital India programme for five years (period 2021-22 to 2025-26) with an outlay of INR 14,903 crore. The extension would focus on skill upgradation, IT infrastructure modernization, and improvement in cyber security, among others.

Adoption of Hybrid Cloud Model

Rapid digitization of citizen services has created massive volume of data, with varying sensitivity levels. This has created the need for a hybrid cloud strategy, which provides both flexibility as well as enhanced data security. The hybrid cloud model has facilitated initiatives such as the MyGov Saathi app, engaging over 2.5 crore users. Additionally, entities like the IT Regulators of India and the Development Authority of Maharashtra leverage hybrid cloud models for government-to-consumer operations.

The Government of India has embraced a cloud-first approach, aiming to make it the default option for ministries/departments to enhance citizen-centric services and internal efficiency. The introduction of MeghRaj in 2013 facilitated cloud technology benefits within the government sector, leading numerous ministries/departments to initiate their cloud journey. Despite progress, some entities hesitate due to concerns like data security, control after migration, data loss, and application compatibility. Central and state governments are actively promoting cloud awareness.

Impact on IT infrastructure

The most direct benefit is a surge in demand for IT infrastructure solutions. Government projects often involve large-scale data center upgrades, network expansion, and cloud adoption, all of which require robust hardware, software, and implementation services. This translates to increased revenue and project opportunities for IT infrastructure providers.

The government's initiatives often involve implementing advanced technologies like cloud computing, Big Data analytics, and cybersecurity solutions. This pushes IT infrastructure providers to innovate and offer new solutions, keeping them at the forefront of technological advancements. Government IT projects tend to be large-scale and often involve multi-year contracts. This provides stability and recurring revenue for infrastructure providers, allowing them to invest in research and development and expand their capabilities.

Increased Demand for Products and Services:

- Hardware: Increased spending translates to a greater demand for hardware components like servers, storage solutions, networking equipment, and security solutions. This creates a larger market for companies that manufacture, sell, and maintain these products.

- Software: Government projects often require specialized software solutions for data management, analytics, communication, and cybersecurity. This opens doors for software providers who can cater to these specific needs.

- Services: Implementation, integration, and management of these complex IT systems require expertise. IT infrastructure providers benefit by offering services like system design, deployment, data center management, and ongoing maintenance.

Focus on Emerging Technologies:

- Cloud Adoption: The government's push for cloud migration creates a demand for cloud service providers (CSPs) who offer public, private, or hybrid cloud solutions. This benefits companies like Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP) along with domestic players.

- Cybersecurity Solutions: As the government stores and manages more data, robust cybersecurity measures become crucial. This creates opportunities for companies specializing in network security, data encryption, and intrusion detection systems.
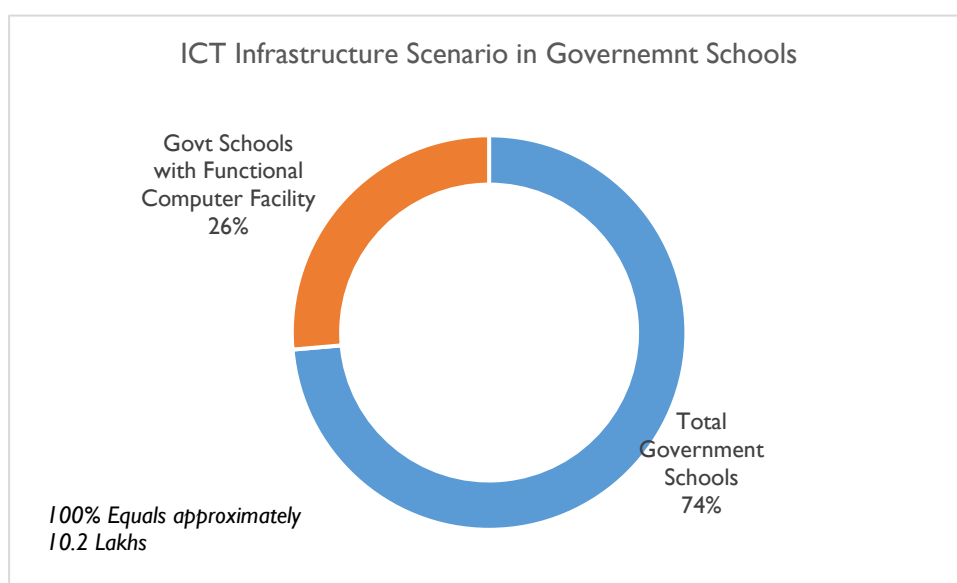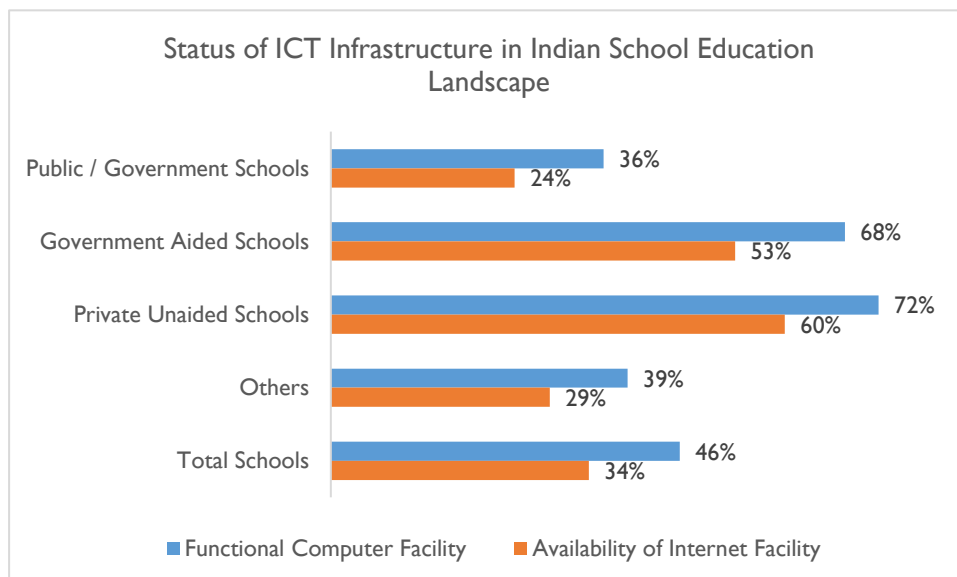
Project Opportunities:

- Large-Scale Infrastructure Projects: Government initiatives like "Digital India" and "Smart Cities Mission" involve building large-scale IT infrastructure like data centers, fiber optic networks, and citizen service platforms. These projects provide lucrative contracts for IT infrastructure providers who can design and build these networks.

- Specialization and Innovation: Government projects often have unique requirements, prompting infrastructure providers to develop specialized solutions and niche expertise. This fosters innovation within the sector and allows companies to differentiate themselves.

IT Infrastructure Modernization in Public Education Sector

The rapid growth in internet penetration in the country have facilitated the integration of ICT into public education domain. The development of digital infrastructure has helped in improving the access to education specifically among rural population. The Union Government have implemented a range of policy initiatives to leverage the ICT infrastructure. These include Digital Infrastructure for Knowledge Sharing (DIKSHA) platform, and initiatives by various state Governments to popularity virtual classroom & digital learning.

Current Scenario

According to Ministry of Education, only 46% of the schools in the country has a functional computer facility while only 34% has internet availability. These numbers decline to 36% and 24% respectively when only Government / public schools are considered. These numbers highlight the underdeveloped state of ICT infrastructure in Indian school education landscape.

Status of ICT Infrastructure in Indian School Education Landscape

Category	Functional Computer Facility	Availability of Internet Facility
Public / Government Schools	36%	24%
Government Aided Schools	68%	53%
Private Unaided Schools	72%	60%
Others	39%	29%
Total Schools	46%	34%

ICT Infrastructure Scenario in Governemnt Schools

Govt Schools with Functional Computer Facility 26%

Total Government Schools 74%

100% Equals approximately 10.2 Lakhs

Source: Department of School Education & Literacy, Ministry of Education, Government of India, Data for FY 2022

Government schemes promoting ICT infrastructure in education sector.

Samagra Shiksha Scheme:

The ICT and Digital Initiatives component of Samagra Shiksha targets Government and Aided Schools offering classes VI to XII. This facet entails providing financial support for the establishment of ICT Labs and Smart Classrooms within schools. States and Union Territories (UTs) have access to non-recurring and recurring grants under the 'ICT and Digital Initiatives' component, with two available options:

- **Option I**: Schools lacking previous ICT facilities can choose between establishing an ICT Lab or Smart Classrooms, depending on their specific needs. Additionally, if a school enrols over 700 students, it may be eligible for an additional ICT lab.
- **Option II:** Schools already equipped with ICT facilities can opt for Smart Classrooms according to the scheme's guidelines.

Achievements During 2018-19 to 2023-24

- In 2022-23, Samagra Shiksha achieved significant milestones in enhancing digital infrastructure and education facilities nationwide. These include sanctioning 8,989 ICT Labs, 30,792 Smart Classrooms, 1,482,565 tablets (TABS), and 6,525 ICT Labs in Block Resource Centers (BRCs).
- Over the given period, a total of 3,062 schools spanning across Elementary, Secondary, and Higher Secondary levels have undergone upgrades, thereby improving the infrastructure and quality of education.
- Coverage under ICT & Digital Initiatives: A significant achievement lies in the coverage of 122,757 schools under ICT & Digital initiatives, which includes the implementation of Smart Schools, thus ensuring access to modern technological resources for educational enhancement.
- Approval for ICT & Smart Classrooms: Since its inception until November 2023, remarkable progress has been made in the approval and implementation of ICT Labs and Smart Classrooms nationwide. Specifically, ICT Labs have been approved in 135,740 schools, while Smart Classrooms have been established in 103,662 schools, facilitating a conducive learning environment equipped with digital tools and resources.

PM e-VIDYA

The National Mission on Education through Information and Communication Technology (NMEICT) has been conceptualized as a Centrally Sponsored Scheme aimed at harnessing the potential of ICT to enhance the teaching and learning process for learners in Higher Education Institutions, accessible anytime and anywhere. Its primary objective is to narrow the digital gap, which refers to the disparity in the ability to utilize computing devices for educational purposes among urban and rural teachers/learners in higher education.

In response to the directives outlined in the National Education Policy 2020, which emphasize investment in digital infrastructure and innovative teaching methodologies, the government launched a comprehensive initiative known as PM e-VIDYA on May 17, 2020, as part of the Atma Nirbhar Bharat Abhiyaan. This initiative

aims to consolidate all endeavours related to digital, online, and on-air education, facilitating multi-mode access to educational resources.

PM e-VIDYA offers a diverse range of educational resources and platforms to students across all states, free of cost. These resources include digital infrastructure, online teaching platforms and tools, virtual laboratories, digital repositories, online assessments, and technology and pedagogy for online teaching-learning. Additionally, PM e-VIDYA promotes multilingualism and recognizes the importance of language in teaching and learning by employing innovative and experiential teaching methods.

Through the PM e-VIDYA initiative, the government seeks to democratize access to education, ensuring that all students have equitable opportunities to engage with high-quality educational content regardless of their geographical location or socio-economic background.

Digital University

Government of India in its Budget 2022-2023 has announced establishment of Digital University. The University will provide access to students across the country for world-class quality universal education with personalised learning experience at their doorsteps. This will be made available in different Indian languages and Information & Communication Technology (ICT) formats. The University will be built on a networked hub-spoke model, with the hub building cutting edge ICT expertise. The best public universities and institutions in the country will collaborate as a network of hub-spokes. The Department of Higher Education, in consultation with University Grants Commission (UGC), All India Council for Technical Education (AICTE) and other stakeholders has initiated the process to ensure the early start of this digital university.

IT Infrastructure Modernization Initiatives

India's Ministry of Education has embarked on a groundbreaking modernization journey by selecting Oracle Cloud Infrastructure (OCI) to transform the national education technology platform, 'Digital Infrastructure for Knowledge Sharing' (DIKSHA). This strategic migration not only enhances the accessibility of DIKSHA but also significantly reduces its IT costs, marking a pivotal advancement in India's educational landscape.

DIKSHA, a cornerstone of India's Digital Public Infrastructure (DPI) initiatives, was meticulously crafted to cater to school education and foundational learning programs. Leveraging the open-source platform Sunbird, DIKSHA empowers teachers to foster inclusive learning environments for underserved and disabled learners nationwide. With over 200 million students and 7 million teachers from government and private schools accessing content contributed by more than 11,000 collaborators, DIKSHA serves as a beacon of educational empowerment.

Since transitioning to OCI, DIKSHA has experienced a paradigm shift, reaping the benefits of enhanced scalability, security, cost-effectiveness, and dynamic capacity adjustment based on demand. This transformation has bolstered DIKSHA's ability to deliver vast amounts of content, accommodating the burgeoning needs of students and educators as the platform expands.

The monumental scale of the DIKSHA platform necessitated a cloud service provider capable of efficiently handling extensive data processing, storage, and distribution. OCI emerged as the ideal solution, equipped with robust capabilities to manage DIKSHA's diverse data formats and intricate workflows. Employing OCI Compute VMs, OCI Storage, and OCI Container Engine for Kubernetes (OKE), DIKSHA seamlessly manages its workload, stores application content, and orchestrates microservices to ensure uninterrupted service delivery.

Furthermore, OCI Media Flow and OCI Media Streams play a pivotal role in optimizing user access to DIKSHA's extensive library of nearly 1.5 million videos. By processing and storing video content in the appropriate formats and resolutions, OCI facilitates seamless content delivery tailored to users' preferences.

The adoption of OCI by India's Ministry of Education underscores a transformative shift towards leveraging cutting-edge technology to revolutionize education delivery and accessibility. As DIKSHA continues to evolve and expand its reach, Oracle Cloud Infrastructure remains a steadfast partner, driving innovation and empowerment within India's educational ecosystem.

IT Infrastructure Modernization in BFSI Domain

In recent years, the BFSI sector has witnessed a rapid shift towards digitalization, driven by changing consumer preferences, technological advancements, and regulatory mandates. The adoption of digital technologies has revolutionized banking, financial services, and insurance operations, enabling organizations to streamline processes, expand market reach, and deliver personalized services to customers. Moreover, IT infrastructure modernization has become imperative to support the growing demands of digital banking, data analytics, and cybersecurity in an increasingly interconnected world.

The Government of India's commitment to fostering a cashless economy, notably following the 2016 demonetization drive, has accelerated the country's transition to digital financial services. The Digital India initiative has also played a significant role in promoting awareness and adoption of digital payments. Over the past decade, India has witnessed a surge in digital transactions, facilitated by widespread smartphone penetration and the availability of affordable data plans.

As a result of these technological advancements, digital financial transactions in India have increased exponentially, particularly in the wake of the COVID-19 pandemic. Between FY 2018 and FY 2023, the number of digital transactions in banking space increased by a CAGR of nearly 44% to reach approximately 12,650 crore transactions per annum.
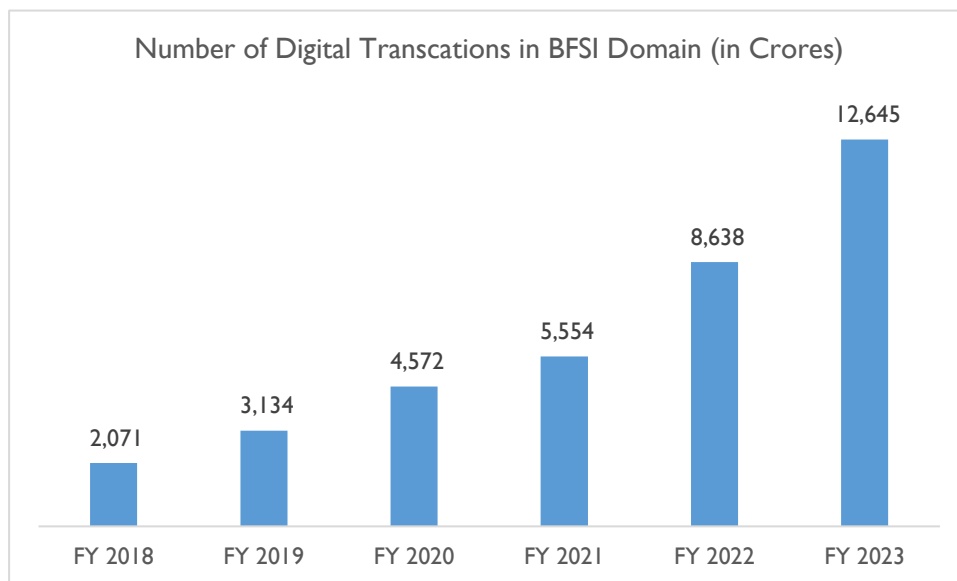
Source: Government of India

Among these platforms, Unified Payments Interface (UPI) has emerged as a game-changer since its launch in 2016. Initially representing only 6% of digital transactions compared to 36% for card payments, UPI's share has skyrocketed to 63%, while card payments have dwindled to 9% as of 2021. n April 2023 alone, over 33 crore Indian UPI users conducted 89880 crores digital payment transactions valued at Rs. 14.07 lakh crore, solidifying UPI's status as the nation's preferred payment method, with three out of every four digital transactions in India being carried out on the UPI platform.

IT Infrastructure Modernization Initiatives

In the dynamic landscape of the BFSI sector, IT infrastructure modernization plays a critical role in enabling organizations to adapt to evolving technological trends, enhance operational efficiency, and deliver seamless customer experiences. This section delves into the importance of IT infrastructure modernization in the BFSI domain, highlighting key initiatives and technologies driving transformation in this sector.

With the exponential growth of data and increasing customer expectations for real-time services, BFSI organizations are under pressure to modernize their IT infrastructure to meet the demands of the digital age. This modernization effort encompasses various components, including hardware, software, networking, and cybersecurity systems. Upgrading legacy systems to more agile and scalable architectures is essential for supporting the rapid pace of innovation and ensuring seamless integration with emerging technologies.

One of the primary drivers of IT infrastructure modernization in the BFSI sector is the adoption of cloud computing technology. Cloud solutions offer scalability, flexibility, and cost-effectiveness, allowing organizations to optimize resource utilization, improve data management, and enhance operational agility. By migrating data and applications to cloud platforms, BFSI organizations can streamline operations, reduce infrastructure costs, and accelerate time-to-market for new products and services.

Furthermore, the proliferation of digital channels and the increasing volume of online transactions have heightened the importance of cybersecurity in the BFSI sector. IT infrastructure modernization efforts include the implementation of advanced cybersecurity measures, such as multi-factor authentication, encryption, and threat detection systems, to safeguard sensitive data and mitigate cyber risks. Building a resilient cybersecurity framework is crucial for maintaining customer trust and complying with regulatory requirements in an increasingly interconnected and data-driven environment.

Additionally, BFSI organizations are leveraging emerging technologies such as artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA) to enhance operational efficiency and customer engagement. AI and ML algorithms are being deployed for predictive analytics, fraud detection, and personalized customer services, enabling organizations to gain valuable insights from data and deliver tailored solutions to individual customers. RPA solutions are automating repetitive tasks, reducing manual errors, and improving process efficiency across various business functions.

Digital Transformation Initiatives

The BFSI sector is witnessing a profound digital transformation driven by changing consumer behaviours, technological advancements, and evolving regulatory landscapes. This section explores the key digital transformation initiatives undertaken by BFSI organizations to stay ahead in a competitive market and meet the evolving needs of customers.

One of the primary digital transformation initiatives in the BFSI sector is the development and deployment of mobile banking applications. Recognizing the increasing reliance on smartphones and mobile devices, banks

and financial institutions have invested heavily in creating user-friendly and feature-rich mobile apps. These apps enable customers to perform a wide range of banking transactions, such as account inquiries, fund transfers, bill payments, and mobile deposits, conveniently from their mobile devices. Mobile banking apps not only enhance customer experience but also drive customer engagement and loyalty.

Furthermore, BFSI organizations are leveraging advanced analytics and artificial intelligence (AI) technologies to gain actionable insights from vast amounts of data. By harnessing the power of data analytics, banks and financial institutions can better understand customer behaviour, preferences, and needs. AI-powered chatbots and virtual assistants are being deployed to provide personalized recommendations, address customer queries, and facilitate self-service transactions, thereby improving customer satisfaction and reducing operational costs.

Another critical digital transformation initiative in the BFSI sector is the adoption of blockchain technology. Blockchain offers immutable and transparent transaction records, enhancing security, trust, and efficiency in financial transactions. BFSI organizations are exploring various use cases for blockchain, including cross-border payments, trade finance, identity verification, and smart contracts. By leveraging blockchain technology, banks and financial institutions can streamline processes, reduce fraud, and lower transaction costs, ultimately enhancing operational efficiency and fostering innovation.

Moreover, BFSI organizations are embracing open banking and API (Application Programming Interface) ecosystems to facilitate collaboration and innovation in the industry. Open banking initiatives enable banks to securely share customer data and services with third-party developers and fintech startups through APIs. This collaboration fosters the development of innovative financial products and services, such as personal finance management apps, peer-to-peer lending platforms, and robo-advisors, enriching the overall customer experience and expanding market opportunities.

IT Infrastructure Modernization in Government Service Delivery

UIADI Biometric Upgrade

The Unique Identification Authority of India (UIDAI) is mandating an upgrade from L0 to L1 biometric devices for Aadhaar authentication. This upgrade signifies a significant step towards enhancing security and accuracy in Aadhaar-based fingerprint and iris recognition systems.

The older L0 devices rely on basic sensors to capture fingerprints and iris scans. They offer a lower level of security and may be prone to errors due to limitations in sensor technology. This risk has prompted an upgrade to L1 devices which are equipped with advanced capacitive fingerprint sensors and high-resolution iris scanners. L1 devices offer improved image quality, leading to higher accuracy and better resistance to spoofing attempts.

Impact of Upgrade: Opportunities for IT Infrastructure Service Providers

The L1 biometric upgrade presents a lucrative opportunity for IT infrastructure companies in several ways:

- Device Deployment and Maintenance: The rollout of millions of L1 devices across India necessitates efficient deployment and maintenance services. IT infrastructure companies can offer logistics and on-site support for device installation, configuration, and troubleshooting.
- System Integration: Integrating L1 devices with existing Aadhaar infrastructure requires expertise in system integration. IT infrastructure companies can provide services for seamless integration and data transfer between devices and central systems.
- Cybersecurity Solutions: The increased focus on security necessitates robust cybersecurity solutions for L1 devices and the overall Aadhaar infrastructure. IT infrastructure companies can offer security assessments, penetration testing, and vulnerability management services.
- Training and Awareness: The transition to L1 devices requires training for users and administrators. IT infrastructure companies can develop training programs to educate users on the proper use of L1 devices and create awareness about Aadhaar security best practices.

Point of Sale (PoS) Mandate for Direct Benefit Schemes

The Indian government's initiative to mandate Point-of-Sale (PoS) machines for Direct Benefit Transfer (DBT) schemes signifies a significant shift towards financial inclusion and transparency. DBT involve electronically transferring government subsidies and benefits directly to beneficiaries' bank accounts. The PoS mandate requires using PoS machines for authenticating beneficiaries and recording transactions when they utilize these benefits at designated points.

Opportunities for IT Infrastructure Service Providers

The PoS mandate creates exciting opportunities for IT infrastructure companies in several areas:

- **PoS Hardware and Software Providers:** There will be a surge in demand for PoS machines, catering to various functionalities and price points. IT infrastructure companies can supply, and install these devices. Additionally, there's a need for developing and integrating secure PoS software solutions.
- **Connectivity Solutions:** Reliable internet connectivity is crucial for PoS transactions, especially in rural areas. IT infrastructure companies can provide solutions like satellite internet, VSAT, or robust broadband services to ensure seamless connectivity for PoS devices.
- **Payment Network Services:** The increased volume of PoS transactions necessitates efficient payment network processing. IT infrastructure companies can offer payment gateway solutions and network management services to ensure smooth transaction processing.
- **Data Security and Management:** Securing sensitive financial data from PoS transactions is paramount. IT infrastructure companies can provide data encryption solutions, security audits, and robust data management solutions to safeguard sensitive information.
- **Training and Support:** Rolling out PoS systems across a vast nation requires training for retailers, beneficiaries, and government officials. IT infrastructure companies can develop training programs and provide ongoing technical support for all stakeholders involved.

Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDSA)

The Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDSA), launched in 2017, is a flagship initiative of the Government of India aimed at empowering rural India with digital literacy skills.

Opportunities for IT Infrastructure Service Providers

The PMGDSA has opened doors for IT infrastructure companies to play a vital role in India's digital transformation journey:

- **Training and Development:** There's a demand for companies that can develop and deliver effective digital literacy training programs tailored to the needs of rural populations. This includes creating content in local languages and utilizing user-friendly training modules.
- **Technology Infrastructure:** Providing access to computers, tablets, or smartphones for training purposes is crucial. IT infrastructure companies can collaborate with the government to set up training centers or provide low-cost devices for rural communities.
- **Connectivity Solutions:** Bridging the digital divide in rural areas requires innovative solutions for internet connectivity. IT infrastructure companies can explore options like satellite internet, VSAT, as well as establishing robust broadband networks in rural areas.

Data Centre Policy 2020

The Data Centre Policy 2020, launched by the Ministry of Electronics and Information Technology (MeitY), aims to accelerate the growth of data center infrastructure in India. This policy introduces a series of reforms to streamline the setup process, incentivize investments, and position India as a global data center hub.

Opportunities for IT Infrastructure Service Providers

The Data Centre Policy 2020 presents a golden opportunity for IT infrastructure companies offering a range of services:

- <u>System Integration:</u> Designing and integrating complex data center infrastructure, including hardware, software, and network components, will be in high demand. Companies with expertise in system integration can play a crucial role.

- <u>Hardware Services:</u> Supplying, installing, and maintaining data center hardware like servers, storage solutions, cooling systems, and security equipment will see a surge in demand. IT infrastructure companies with robust hardware service portfolios are well-positioned.

- <u>Project Management Services:</u> Managing large-scale data center projects from planning and construction to deployment and ongoing maintenance requires skilled project managers. Companies with experience in managing complex IT infrastructure projects will be in high demand.

- <u>IT Facility Management Services</u>: Providing comprehensive data center facility management services, encompassing power management, environmental controls, physical security, and disaster recovery solutions, will be crucial. Companies with expertise in this area can capitalize on this opportunity.

- <u>IT Consulting Services:</u> Offering strategic IT consulting services to businesses planning to set up or migrate to data centers will be in high demand. This includes advising on data center design, technology selection, and implementation strategies.

- <u>IT Infrastructure Solutions:</u> Delivering complete IT infrastructure solutions encompassing hardware, software, managed services, and expertise in data center design and deployment will be attractive to businesses. Companies offering bundled solutions can gain a competitive edge.

Digital Personal Data Protection (DPDP) Act

The Digital Personal Data Protection Act (DPDP) Act, 2023, is a landmark legislation in India that governs the processing of digital personal data. It aims to strike a balance between protecting individual privacy and enabling businesses to leverage data for legitimate purposes.

Impact on Businesses Handling Data:

The DPDP Act will significantly impact businesses that handle personal data of Indian citizens.

- <u>Compliance Costs:</u> Businesses will need to invest in building processes and systems to comply with the Act's requirements. This includes obtaining consent management platforms, data security solutions, and potentially hiring data protection officers.

- <u>Shift in Data Governance:</u> Businesses will need to adopt a more transparent and accountable approach to data governance. This involves documenting data collection practices, purposes, and retention periods.

- <u>Potential for Disruption:</u> Non-compliance with the Act can lead to penalties and reputational damage. Businesses may need to review their data collection practices and marketing strategies to ensure compliance.

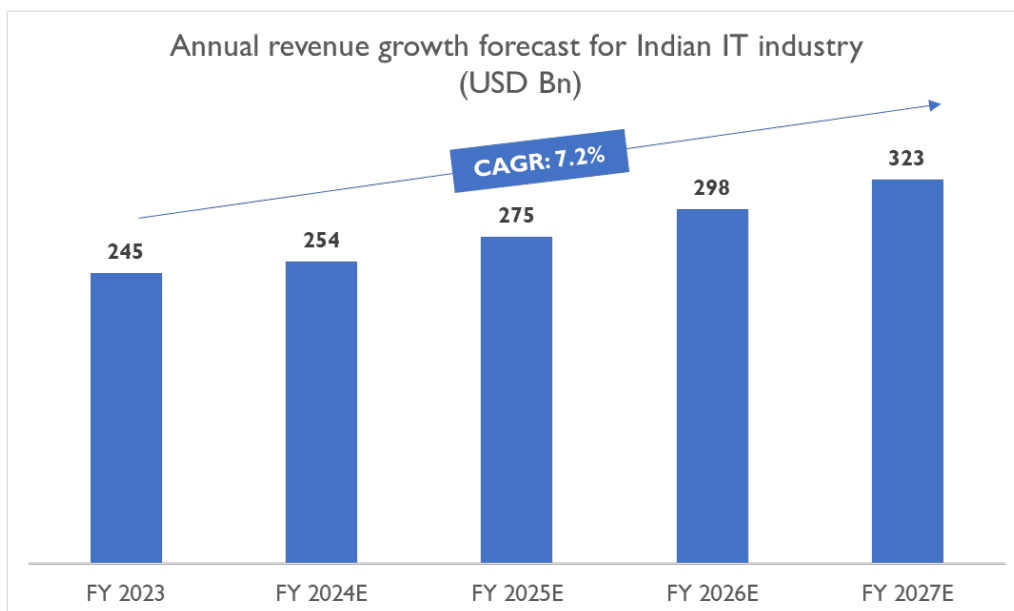**Opportunities for IT Infrastructure Service Providers**

The DPDP Act presents significant opportunities for IT infrastructure companies that can help businesses achieve compliance:

- <u>Data Security Solutions:</u> The increased focus on data security creates a demand for solutions like data encryption, access controls, and intrusion detection systems. IT infrastructure providers can offer these solutions and consulting services to help businesses secure their data.

- <u>Consent Management Platforms:</u> Businesses will need tools to manage consent from individuals for data collection. IT infrastructure providers can develop or integrate consent management platforms that streamline this process.

- <u>Data Governance Solutions:</u> Software solutions for data lineage tracking, data discovery, and data anonymization can help businesses manage and govern their data effectively. IT infrastructure providers can offer these solutions or partner with existing providers.

- <u>Cloud-based Compliance Solutions:</u> Cloud service providers can offer solutions specifically designed to help businesses comply with the DPDP Act's data storage and residency requirements.

Growth Forecast

The Indian IT industry is experiencing a period of significant growth, driven by a confluence of factors. According to estimates, the industry is expected to grow at CAGR of 7.2% to reach USD 323 billion by 2027. The global shift towards digitalization has increased the demand for IT services across industries. Indian IT firms, with their expertise in software development, cloud solutions, and system integration, are well-positioned to capitalize on this trend.

Compared to developed economies, India offers competitive rates for IT services, making it an attractive option for businesses worldwide. This advantage, coupled with a large pool of skilled professionals, continues to attract global clients. The rise of technologies like artificial intelligence, blockchain, and the Internet of Things (IoT) is creating new opportunities for the Indian IT industry. Companies are investing in developing expertise in these areas to meet evolving client needs.

Annual revenue growth forecast for Indian IT industry (USD Bn)

CAGR: 7.2%

FY 2023	FY 2024E	FY 2025E	FY 2026E	FY 2027E
245	254	275	298	323

Source: NASSCOM, Industry Articles, D&B Research and Estimates

Notably, the domestic IT market is expected to grow even faster. This rapid expansion presents exciting opportunities for both Indian businesses and the global IT landscape. The Indian government is actively promoting digital adoption through initiatives like "Digital India," which aims to make government services more accessible online and bridge the digital divide. This creates significant demand for IT infrastructure and services within the country. The rising middle class in India is driving demand for consumer-focused IT products and services, such as e-commerce platforms, digital payment solutions, and online entertainment options. India's thriving start-up ecosystem is fueling demand for IT services as these new businesses require solutions for website development, app development, cloud infrastructure, and cybersecurity.

Competitive Landscape

The Indian IT infrastructure industry is flourishing, driven by a growing demand for digital solutions. The competitive landscape is dynamic, with established players facing competition from innovative mid-tier players and niche specialists. The market is teeming with both established players and emerging ones, creating a dynamic competitive environment. Major players like TCS, Wipro, Infosys, and HCL Technologies offer comprehensive IT infrastructure solutions, including data center services, network management, and cloud solutions. These companies leverage their vast experience, global reach, and diverse service portfolios to gain a competitive edge.

Mid-sized players like L&T Infotech, Tech Mahindra, and Mphasis are also making their mark, offering cost-effective solutions and catering to specific market segments. Additionally, niche players with specialized expertise in areas like cloud migration, network security, and disaster recovery are carving out their space, further intensifying the competitive landscape.

Competition is evolving beyond just cost and service offerings. Factors like innovation, agility, and specialization are becoming increasingly important. Companies are differentiating themselves by investing in cutting-edge technologies like artificial intelligence and automation, adopting agile methodologies, and developing domain-specific expertise. Additionally, the rise of cloud-based solutions is disrupting traditional business models, forcing players to adapt and develop new competitive strategies.

The Government of India's Digital India initiative fuels the demand for IT infrastructure solutions as businesses and government entities across the country rapidly digitize their operations to facilitate e-governance, citizen services, and business enablement. The rapid adoption of cloud-based solutions drives the need for IT infrastructure services focusing on cloud migration, management, and optimization. Companies look for providers to help them move workloads to the cloud and manage hybrid cloud environments. Rising cybersecurity threats increase the demand for robust network, data, and infrastructure security solutions. Companies require assistance in vulnerability assessments, threat detection, and incident response. The need for data centers to store and process increasing volumes of data is pushing the requirement for IT infrastructure players with specialized expertise in data center design, build-out, and management.

The domestic IT infrastructure industry in India is highly competitive, featuring a mix of established global players, large Indian conglomerates, and specialized mid-sized firms. Companies like TCS, Wipro, Infosys, and HCL Technologies dominate the market, leveraging their global reach, extensive resources, and diversified portfolios. These players offer a full range of IT infrastructure services, from cloud solutions and data center management to network security and managed services. Mid-sized players like L&T Infotech, Tech Mahindra, Mphasis, and others compete by providing a mix of cost-effectiveness, niche specialization, and focus on specific industry verticals. They often have strong regional presence and established relationships with specific clientele. Smaller, niche players compete by focusing on specialized areas like cloud migration, network security, cybersecurity, or infrastructure solutions for specific sectors like healthcare or education.

Entering the domestic IT infrastructure industry requires significant technical expertise and investment in skilled resources. Setting up modern data centers, establishing cloud solutions, and building robust networking infrastructure can be capital intensive. Especially to cater to the government sector, where pre-qualifications are mandatory, which often involve a minimum number of years of experience, proven track record of successfully executing similar projects, and financial stability. Additionally, obtaining security clearances and adhering to stringent compliance regulations can be challenging for new entrants. Government contracts often require domain-specific expertise and experience in handling large-scale projects. Additionally, specific security certifications and adherence to data privacy regulations are mandatory.

TCS provides a comprehensive portfolio of IT infrastructure services, including data center operations, managed services, and cloud solutions. For example, TCS established and currently maintains the infrastructure for the Passport Seva, a government initiative facilitating passport issuance.

Wipro offers a comprehensive portfolio of IT infrastructure services for government agencies, including cloud solutions, data center management, and network security. They have been involved in projects like the implementation of the Integrated Traffic Management System (ITMS) for Delhi and the National Knowledge Network (NKN) project.

HCL Technologies offers a diverse IT infrastructure service portfolio for the government sector, encompassing data center operations, network management, and cloud solutions. They have implemented projects like the National e-Governance Plan (NeGP) and the digitization of land records for various state governments.

L&T Infotech specializes in offering IT infrastructure solutions catering to specific needs of government agencies. They have been involved in projects like the implementation of the Goods and Services Tax Network (GSTN) and the automation of various processes for the Ministry of Defence.

While the government sector presents unique challenges with its stringent entry barriers and specific requirements, it also offers significant opportunities for players with the right expertise and experience.

Key factors shaping competition.

Pricing	
Cost-effective Solutions	Indian IT service providers are known for their ability to offer cost-efficient solutions compared to many developed nations. This cost advantage remains a primary factor attracting domestic businesses seeking to maximize the value of their IT investments

Competitive Bidding	The Indian IT market has many established players and emerging firms, leading to a highly competitive bidding environment for projects. This can drive price pressure, particularly for commoditized services
Flexible Pricing Models	IT providers in India often offer flexible pricing models to cater to diverse client needs. These could include fixed-price contracts, pay-as-you-go models, or outcome-based pricing, allowing clients to tailor their IT spend

Service Offerings	
Broad Range of Services	Indian IT firms offer a comprehensive spectrum of services, including software development, IT infrastructure management, cloud services, cybersecurity, business process outsourcing, and analytics. This allows businesses to find a single vendor for multiple needs.
Specialization in Emerging Technologies	Many Indian IT companies are differentiating themselves by specializing in areas like artificial intelligence, machine learning, blockchain, IoT, and advanced analytics. This specialization in niche areas helps them stand out in a crowded market.
Emphasis on Innovation	Top Indian IT companies invest significantly in research and development to stay ahead of the technology curve. They prioritize innovation, offering cutting-edge solutions for a rapidly evolving digital landscape

Other Factors	
Talent Pool	India's large and skilled IT workforce is a significant driver of the industry's growth and competitiveness. The continuous supply of

	engineers and IT professionals provides an advantage in terms of resource availability and cost optimization.	
Domestic Market Understanding	Indian IT service providers have a deep understanding of the local business dynamics, regulatory requirements, and cultural nuances. This understanding can be a key differentiator when working with Indian businesses..	
Government Support	Government initiatives like "Digital India" and "Make in India" have fostered a conducive environment for the domestic IT industry. Programs promoting technology adoption and innovation contribute to the industry's growth.	

Key Player Profiles

Profile of key players catering to domestic IT industry

Company Name	Brief Profile	Services Offered
Telecommunications Consultants India Limited (TCIL)	It is a wholly-owned Government of India Public Sector Undertaking under the administrative control of the Department of Telecommunications (DoT), Ministry of Communications. Established in 1978, it is a leading engineering and consultancy company offering services in the fields of telecommunications, information technology, and civil construction.	TCIL offers various IT services, such as: • IT infrastructure planning, design, and implementation • Software development and maintenance • Cybersecurity solutions • Data center services

Company Name	Brief Profile	Services Offered
Larsen & Toubro (L&T)	It is a multinational conglomerate headquartered in Mumbai, India. Established in 1938, it has a long history and strong presence in several key sectors such as Engineering & Construction (E&C) , Information Technology & Services (IT&S), Financial Services, making it a leading player in the Indian economy.	Information Technology & Services segment is represented by L&T Technology Services (LTTS), a listed subsidiary focusing on: Engineering design and development: LTTS offers services like product development, embedded systems, and engineering process management for various sectors. Digital transformation: The company assists clients in implementing digital solutions like automation, data analytics, and cloud adoption.

Company Name	Brief Profile	Services Offered
Extramarks Education	It is an Indian education technology (EdTech) company established in 2007. It offers a comprehensive suite of online and offline learning solutions for students across various age groups and educational needs.	Pre-school and K-12: Extramarks provides curriculum-based resources and interactive learning modules for students ranging from pre-school to class 12. Higher Education and Test Prep: The company offers dedicated online courses and preparation materials for various competitive exams like JEE (engineering entrance), NEET (medical entrance), and other university entrance exams.
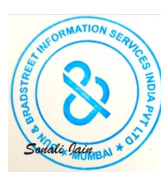
		Skill Development: Extramarks provides vocational and skill development courses in various domains, catering to individual and corporate learning needs.automation, data analytics, and cloud adoption.

Company Name	Brief Profile	Services Offered
Team Computers	It is a leading IT infrastructure and information solutions provider established in India in 1987. With a presence across over 25 cities in the country, it serves over 2500 clients and boasts a workforce exceeding 4,000 individuals.	Core Services:Team Computers offers a comprehensive range of hardware & software solutions Team Computers offers a wide range of IT services, including: • System management • Application management • Network management • Security • management • Cloud services • Managed print services • IT consulting

Company Name	Brief Profile	Services Offered
Hitachi Systems Micro Clinic (HISYS-MC)	It is a system integration (SI) company operating under the umbrella of Hitachi Systems India Pvt. Ltd. Established in 1991, HISYS-MC has carved a niche for itself in the Indian IT landscape,	• Infrastructure Solutions • Cloud Solutions • Networking Solutions • Security Solutions

| | empowering businesses with advanced IT solutions. | • Digital Workplace Solutions
• Managed Services |

Company Name	Brief Profile	Services Offered
Dynacons Systems & Solutions Ltd.	Established in 1995 and headquartered in Mumbai, India, has carved a niche for itself in the IT service industry. They offer a comprehensive suite of IT solutions catering to diverse needs of corporations across various industry verticals.	• Infrastructure Managed Services (IMS) • Break-Fix Services • Managed Print Services (MPS) • Cloud Computing • Systems Integration Services • Applications Development and Maintenance

Company Name	Brief Profile	Services Offered
Value Point Systems Private Limited	It is a leading IT infrastructure solutions and services provider headquartered in Bengaluru, India. Established in 1991 as a partnership firm and reconstituted as a private limited company in 1995, VPSPL has established itself as a trusted partner for businesses seeking reliable and comprehensive IT solutions.	End-to-End Infrastructure Solutions: VPSPL provides a full spectrum of services to design, build, manage, and optimize IT infrastructure, including: • Network infrastructure solutions (LAN, WAN, wireless) • Data center solutions (design, construction, management)

- Cloud computing solutions (migration, management, optimization)

- Cyber security solutions (threat detection, vulnerability management)

- IT infrastructure management (monitoring, maintenance, optimization)

Life Cycle Services: VPSPL offers a comprehensive lifecycle approach to IT infrastructure, encompassing:

- Consulting and planning

- Design and implementation

- Management and support

- Optimization and upgrade

Company Name	Brief Profile	Services Offered
Aabasoft Technologies India Private Limited	It is a global Information Technology (IT) and Information Technology Enabled Services (ITeS) solutions provider headquartered in Kochi, Kerala, India. Established in 2002, the company has grown to serve clients across various industries.	- IT Infrastructure - Cloud Services - Web Technology - Mobile Applications - Enterprise Applications - Business Services - Internet Marketing

Financial Analysis

The IT infrastructure industry in India seems to be facing cost pressures from raw materials, salaries, and potentially project margins. A potential shift towards cloud-based solutions could be reflected in the decrease in power and fuel expenses.

Expense Pattern

Year	Raw Material Expenses	Power & Fuel	Salaries & Wages	SGA Expenses	Interest Expense	EBDITA Margin	Net Margin
FY 2021	18.5%	1.0%	39.9%	13.8%	0.7%	21.3%	8.9%
FY 2022	30.4%	0.5%	48.4%	7.3%	0.6%	11.9%	8.1%
FY 2023	32.6%	0.2%	49.0%	8.6%	0.6%	5.6%	8.6%

Source: MCA, Dun & Bradstreet Research, Based on a Sample of 4 Companies

Raw material expense, salary & wages cost, and SGA expense together account for the bulk of operating cost in IT infrastructure industry. Consolidated expenses incurred under these three key operating in FY 2023, which in turn, resulted in fall in PBDITA. However, the increase in net sales and decline in interest expenses helped in maintaining PAT margins on same levels.

Raw Material Expenses saw consistent increase from 18.5% (FY 2021) to 32.6% (FY 2023) suggesting that the cost of hardware, software, or other materials used in IT infrastructure solutions is rising possibly due to global supply chain disruptions and chip shortages leading to higher component costs with increased demand for newer, more advanced technology leading to premium pricing and fluctuations in currency exchange rates impacting imported materials.

Power & Fuel observed significant decrease from 1.0% (FY 2021) to 0.2% (FY 2023) indicating improved efficiency in energy consumption or a shift towards cloud-based solutions as companies implementing energy-saving measures in data centers (e.g., cooling techniques, hardware upgrades) fueled by increased adoption of cloud-based solutions that require less on-premises hardware and power and shift towards renewable energy sources for powering data centers.

Salaries & Wages expense is observing steady increase from 39.9% (FY 2021) to 49.0% (FY 2023) which reflects rising talent costs in the IT sector or an increase in workforce size due to growing demand for skilled IT professionals, particularly in areas like cloud computing, cybersecurity, and AI with increased competition for talent driving up salaries and wages and expansion of companies and their IT infrastructure teams.

EBITDA Margin saw a significant decline from 21.3% (FY 2021) to 5.6% (FY 2023) possessing as a major concern, indicating a decrease in overall profitability before considering interest, taxes, depreciation, and amortization due the combined effect of rising expenses like raw materials and salaries putting pressure on margins with increased competition leading to lower pricing and tighter profit margins and investments in

new technologies or infrastructure impacting short-term profitability. The decline in EBITDA margin is translating to lower net profits resulting in drop of net profit from FY 2021 to FY 2023.

Financial Snapshot of Selected Peers

Financial Parameters	Revenue*	PBDITA Margin	PAT Margin
Team Computers Pvt. Ltd.	279675	3.7%	2.5%
Telecommunications Consultants India Ltd.	148395	9.7%	2.4%
Dynacons Systems & Solutions Ltd.	80356	7.1%	4.2%

Note: *All the figures are in INR Lakhs | The companies have been indexed on the basis of revenue in FY2023.

Armee Infotech[3]

Profile

Founded in 2011 and headquartered in Ahmedabad, Armee Infotech is a sector-agnostic IT infrastructure solutions and managed services company. They specialize in delivering service to a wide range of clients, including both government/public sector undertakings (PSUs) and private businesses.

History

The company, initially incorporated as "Blossom Infraspace Private Limited" on February 8th, 2011, began its journey under the Companies Act, 1956. A certificate of incorporation was issued by the Registrar of Companies, Gujarat at Dadra and Nagar Haveli.

On March 1st, 2017, the company entered a partnership with M/s Armee Infotech. However, this partnership dissolved shortly after on April 1st, 2017, with the business of M/s Armee Infotech transferring to the company through a deed of dissolution.

Following these events, the company's board passed a resolution on March 31st, 2017, and shareholders approved a special resolution on April 8th, 2017, to change the company's name to "ArMee Infotech Private Limited." A fresh certificate of incorporation reflecting the name change was issued by the Registrar of Companies (RoC) on April 21st, 2017.

Most recently, in February 2024, shareholders approved the company's conversion into a public limited company at an extraordinary general meeting. This conversion also prompted another name change to "ArMee Infotech Limited," with a new certificate of incorporation issued by the RoC on April 24th, 2024.

Particulars	Address	Leased/Owned
Registered and Corporate Office	17, Goyal Intercity, B/h Drive in Cinema, Thaltej Road, Ahmedabad, Gujarat - 380058	Leased

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[3] As per the information provided and stated by Armee Infotech.

Warehouse	Ground floor godown, situated at Satnam Estate, B/h H.P. Petrol Pump, Bavla Road, Sanathal, Chokdi, Ahmedabad, Gujarat - 382210	Leased
Branch Office-1	Unit No. 35, Ground Floor, situated at the shopping mall, the Bristol Hotel, Gurgaon, Haryana – 122002	Leased
Branch Office-2	First Floor, Site no - 01, Lochan Tower, AB Vajpayee Road, VSR Layout, Kadugodi, Bengaluru, Karnataka - 560067	Rented
Branch Office-3	Office No. 112, 1st floor, Alpine Industrial Estate, Military Road, Marol, Andheri East, Mumbai, Maharashtra – 400059	Leased

They offer a comprehensive suite of services categorized into two main areas: IT Infrastructure Solutions and IT Managed Services.

IT Infrastructure Solutions

- Procurement and Implementation: They supply IT hardware and software, including computers, servers, interactive panels, and their peripherals. Their team expertly installs and integrates these solutions to meet specific requirements of the clients.

- Maintenance: They also provide ongoing maintenance for the IT infrastructure they install, ensuring its optimal performance throughout the contractually specified period.

- Seamless User Experience: To ensure seamless transition for their clients, they offer functional training on the newly implemented IT infrastructure.

- Project Experience: They have a proven track record of success in diverse projects. This includes setting up ICT labs, smart classrooms, digital infrastructure for gram panchayats, mobile workforce management solutions, and digitalization of primary agriculture credit societies.

Their commitment to IT Infrastructure Solutions has fueled significant growth. Revenue from IT infrastructure solutions was ₹ 49,998.43 lakhs or 88.90% of their total revenue for the nine-month period ended December 31, 2023. This represents a substantial increase from previous years, with a CAGR of 156.12% between Fiscal 2021 and Fiscal 2023

IT Managed Services

Building upon the foundation laid by their IT Infrastructure Solutions, their IT Managed Services encompass:

- Technical Staffing: They provide skilled IT personnel to support clients ongoing needs.

- Skill Development: They also provide training to ensure that clients team possesses the latest expertise.

- <u>Annual Maintenance Services</u>: They offer comprehensive annual maintenance plans to keep the clients IT infrastructure running smoothly.
- <u>Operational Support:</u> Their team delivers exceptional on-site and off-site operational support and maintenance, as outlined in each service level agreement. Payments are structured for convenience, with pre-defined billing intervals or according to contractual terms.

The IT Managed Services sector has also seen significant growth. Revenue generated from these services was ₹ 6,019.54 lakhs or 10.70% of our total revenue for the nine-month period ended December 31, 2023. Reflecting a CAGR of 48.42% between Fiscal 2021 and Fiscal 2023.
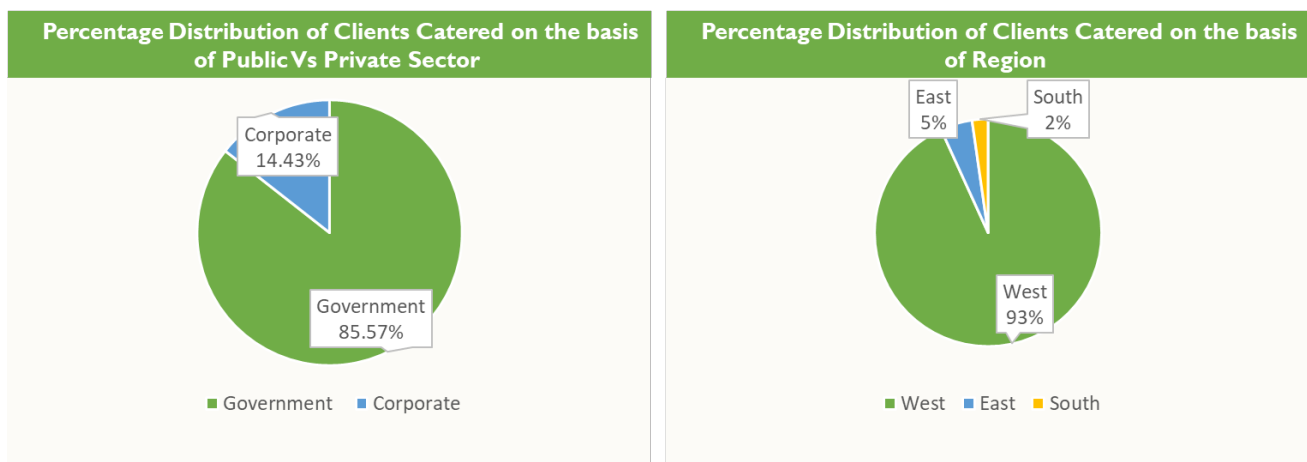
Commitment to Quality and Expertise

They are dedicated to maintaining the highest quality standards in everything they do. This commitment is reflected in their achievement of several prestigious certifications, including ISO/IEC 20000-1:2018 (Information Technology Services Management), ISO 14001:2015 (Environmental Management System), ISO/IEC 27001:2022 (Information Security Management System), and CMMI- DEV V.2.0, Maturity Level 3.

For certain activities, such as site preparation, electrification, and IT infrastructure commissioning, they leverage the expertise of their trusted third-party vendors, including their wholly-owned subsidiary company, Armee Technology Services Private Limited.

Strong Government Focus: Armee infotech boasts a remarkable 85.57% of its clientele within the government sector, showcasing its established position and expertise in catering to public sector IT infrastructure needs. This deep understanding and successful track record make them a trusted partner for government agencies.

Regional Reach: While their expertise extends nationwide, the Company currently focuses its operations primarily on the western region, followed by the eastern region. The southern region currently sees limited activity, but this could potentially present an opportunity for future expansion and diversification.

Percentage Distribution of Clients Catered on the basis of Public Vs Private Sector — Corporate 14.43%, Government 85.57%

Percentage Distribution of Clients Catered on the basis of Region — East 5%, South 2%, West 93%

Key Clients Catered across different Industries

Government

Education

BFSI

Corporate
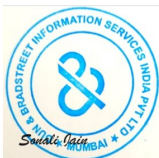
Key Strengths of Armee Infotech

Shorter turnaround time for projects

Proven track record and pre-qualified to tackle diverse government projects

Expert project management team ensures smooth execution & project success

Pioneers in serving government sector, offering unique expertise

Some of the pioneering achievements claimed by the Company include[4].

- Bihar Education Project Council- for Setting up "ICT Labs" [includes Supply, Installation, Commissioning and maintenance of Hardware, Software & Peripherals and Computer Education Services (including manpower etc.)] under ICT & Digital Initiatives intervention in 679 Govt. Elementary & Secondary Schools across Bihar on Build Own Operate and Transfer (BOOT) Model for five years.). **Project Value : Rs. 103 Crore.**

- Gujarat Council of School Education (ICT LEARNING LABS)- For implementing 4162 nos. ICT Learning Lab in total 4004 Schools across Gujarat including Supply of Hardware, Software, including Functional Training and Maintenance of the Systems for 5 years on behalf of Samagra Shiksha, Gujarat Council of School Education (GCSE), Education Department, Government of Gujarat. **Project Value : Rs. 213.75 Crore**.

- Gujarat Council of School Education (GYANKUNJ)- For implementing Gyankunj in 30000 classrooms of Government Elementary & Secondary Schools within the State of Gujarat including Supply of Hardware, Operating Software and Maintenance of the Systems on behalf of Gujarat Council of School Education (GCSE), Education Department, Government of Gujarat. **Project Value : Rs. 246.6 Crore.**

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[4] As per the information on the Company profile on the website.

- E-Gram Vishwa Gram Society (OFFICE OF DEVELOPMENT COMMISSIONER)- For onboarding ePanchayat eGovernance Team (EET) in all the 33 District Panchayats and 248 Taluka Panchayats. They will be supporting e-Goveranace of 14179 Villages Panchayats in the state of Gujart for a period of 5 Years. This Project is part of an ambitious project of introducing eGovernance at grassroots through the panchayati Raj Institution (PRIs). The project is known as the eGram Vishwagram Project. Under the project. **Project Value : Rs. 205 Crore.**

- Panchayat & Rural Development- Video Conferencing Solution. Aadhar Enrolment Kits. Biometric devices. Other IT Infrastructure (Desktops/ Printers etc.) For supply and commissioning of Includes warranty support for 5 years and comprehensive maintenance there after. **Project Value : Rs. 102 Crore.**

- POS Devices for PDS Automation (UPDESCO)- System Integrator for Supply, Installation with Application and Maintenance of PoS Devices for Automation of Fair Price Shops in Rural Areas of Uttar Pradesh. End-to-end computerization of Public Distribution System (PDS) and as part of the implementation of National Food Security Act 2013 (NFSA) across the state of Uttar Pradesh by the Food & Civil Supplies Department, Government of Uttar Pradesh. **Project Value : Rs. 121.5 Crore**

- Skill Development & Livelihood Project (Ministry of Rural Development)- The project (under the scheme Deen Dayal Upadhyaya Gramin Kaushal Yojana) has been implemented in Assam, West Bengal & Uttar Pradesh . In Assam 800 candidates,700 candidates in West Bengal and 800 candidates in Uttar Pradesh has been trained and placed accordingly. Project was focussed on capacity building through domain based skill development training and provide sustainable livelihood to rural un employed youth. **Project Value : Rs. 19 Crore**

- Skill Development & Livelihood Project (Skill development Mission)- Skill development & livelihood project under Uttar Pradesh Skill Development Mission focussed on domain-based training & employment in various sector. Through this project the unemployed youths of Uttar Pradesh are getting trained & employed in various sector. **Project Value : Rs. 5.87 Crore**

Some of the Awards and Recognition received by Armee Infotech
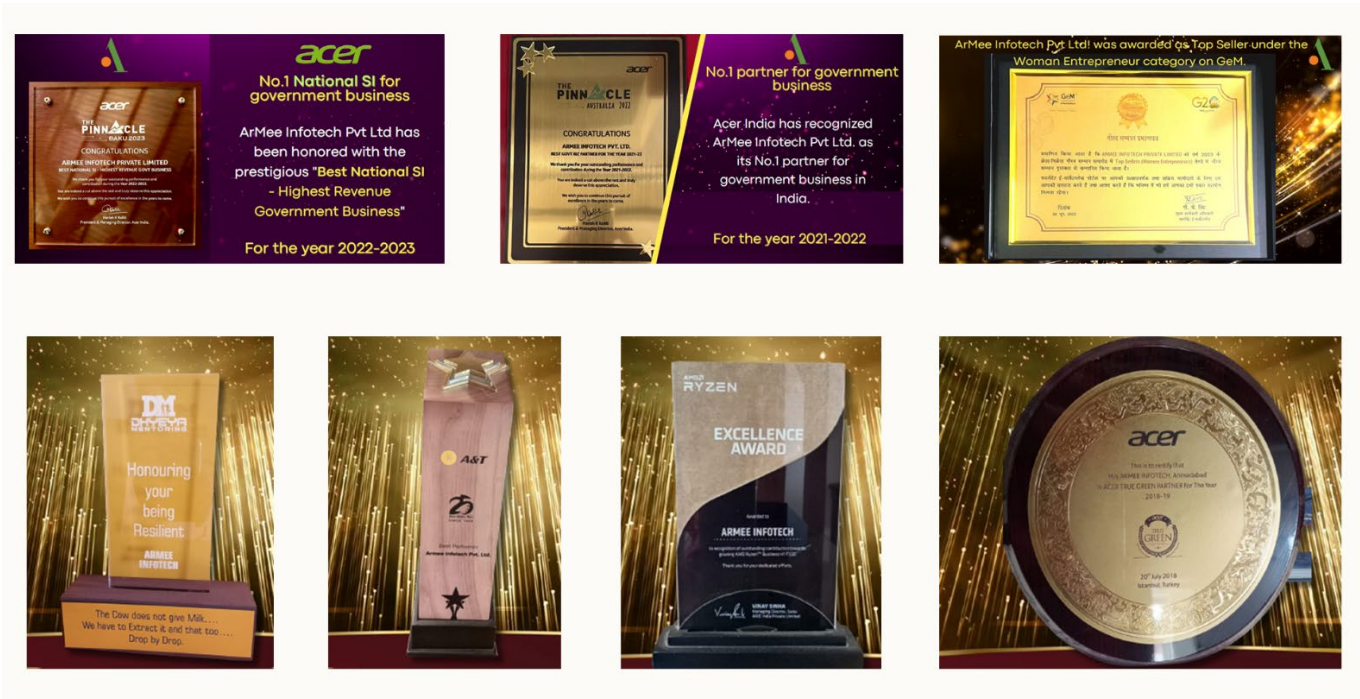
Financial Performance

The Company generated a revenue of INR 502.70 Cr in FY 2023, and an operating profit of approximately INR 16.58 Cr. The Company's operation was impacted in FY 2021 due to the spread of Covid-19 pandemic, but they managed to rebound strongly in the following years. Despite the adverse business environment, Armee Infotech has managed to steadily improve its operating profit margin. By FY 2023 the operating profit margin of the Company stood at 3.3%

Financial Summary (All figures in INR Crore)			
	FY 2021	FY 2022	FY 2023
Revenue from operations	105.05	125.18	502.70
EBDITA[5]	11.30	12.23	17.04
PAT	3.73	3.36	16.58

Source: Armee Infotech

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[5]For EBITDA calculation, we have reduced the other income segment. This is in line with how the Company have arrived at EBIDTA values. D&B have readjusted EBITDA calculation to align with the process followed by the Company. EBDITA= (Finance Cost + Depreciation & Ammortization Expenses + PBT)- Other Income

SWOT Analysis of Armee Infotech

STRENGTHS
- **Strong Government Clientele:** Armee Infotech has established itself within the government and government education sectors, which often have high barriers to entry. This provides a stable and reliable source of revenue with less competition from new players.
- **Regional Expertise:** The company holds a strong regional presence in Gujarat, indicating a deep understanding of the local IT landscape and potentially strong relationships within the region's government bodies.
- **Experience and Quality Standards:** Years of experience have allowed Armee Infotech to develop high-quality standards and expertise in handling government projects. This established reputation gives them an advantage over competitors when bidding for tenders.

WEAKNESSES
- **Limited Geographic Reach:** Dependence on the Gujarati market limits growth potential and restricts access to opportunities in other parts of India.
- **Underdeveloped Private Sector Presence:** Limited presence in the private sector hinders diversification and exposes Armee Infotech to over-reliance on government projects.

SWOT

OPPORTUNITIES
- **Leveraging Government Initiatives:** Government digitalization initiatives create a significant opportunity for Armee Infotech to expand its services in both the public and private sectors. Their existing government clientele and experience position them well to capitalize on these initiatives
- **Rural IT Infrastructure Development:** Government efforts to improve rural India's IT infrastructure present a new market segment for Armee Infotech to explore. Their regional expertise could be valuable in this space.

THREATS
- **Highly Competitive Market:** The IT infrastructure services market is volatile with numerous players from large enterprises to small businesses. This leads to intense competition on pricing and can make it difficult for Armee Infotech to secure deals, especially against bigger brands or those offering lower prices.
- **Maintaining High Quality Standards:** Since they primarily cater to the government sector, Armee Infotech needs to continuously meet stringent quality standards to retain projects. Government tenders and projects have specific requirements, and failing to meet them can lead to disqualification.

Rural India

Traditionally, India has been a nation dominated by rural life. Based sixth economic census, nearly 7 out of 10 people (68.8%) and an even higher proportion of the workforce (72.4%) lived in rural areas. However, this is changing rapidly. India is experiencing a steady shift towards urbanization. Between 2001 and 2011, cities grew at a much faster pace (31.8%) compared to rural areas (12.18%). This trend is driven by two factors: people moving from villages to cities, and some existing rural settlements being reclassified as urban. While India is expected to remain primarily rural until 2050, projections suggest a tipping point after that. By mid-century, the urban population is likely to surpass the rural population for the first time in India's history.

There's a concern that people are migrating to cities from rural areas, often driven by a desperate search for jobs, are creating major problems. These rapid influxes strain city resources and force many low-wage migrants to live in poor conditions. To address this challenge and improve the lives of most Indians, there is a need to focus on making rural areas more economically attractive. This means creating jobs in villages and towns, boosting the rural economy & infrastructure, and narrowing the significant gap between rural and urban incomes. Achieving this requires significantly faster economic growth in rural areas compared to cities. Traditionally, agriculture has been the backbone of rural India. However, for long-term economic success, a shift is needed. By fostering a more productive and diverse rural economy, with a focus on non-agricultural sectors, India can unlock its full economic potential.

In the 1970s, rural areas provided the bulk of the workforce (84.1%) and generated a significant share of national output (62.4%). However, this contribution dropped sharply by 1999-00. Interestingly, the decline in

rural jobs wasn't as steep as the decline in output. This suggests economic growth was happening in urban areas, particularly in capital-intensive industries that didn't create many jobs. As a result, the gap between rural share of output and employment widened. The rural economy picked up pace after 1999-00, matching the growth rate of urban areas. This led to a stabilization of the rural share of national output at around 48%. However, despite this growth, the rural share of output dipped slightly between 2004-05 and 2011-12. While the rural share of output fluctuated, the share of employment in rural areas declined steadily from 76.1% in 1999-00 to 70.9% in 2011-12. This faster decline in rural jobs compared to output share narrowed the gap between rural output and employment to 24% by 2011-12.

Share of rural areas in total NDP and workforce[6]		
Year	Economy(%)	Workforce(%)
1970-71	62.4	84.1
1980-81	58.9	80.8
1993-94	54.3	77.8
1999-00	48.1	76.1
2004-05	48.1	74.6
2011-12	46.9	70.9

Source: The data on rural and urban net domestic product (NDP) is available for the years 1970-71, 1980-81, 1993-94, 1999-00, 2004-05 and 2011-12 at current prices from Central Statistical Office. Workforce information in the country was extracted from the unit-level data of quinquennial employment and unemployment surveys conducted by National Sample Survey Office (NSS-EUS).

Surprisingly, rural areas contribute a significant portion of non-agricultural output (around a third) and nearly half of all non-farm jobs (48.7%). The most dramatic shift is in manufacturing. Between 1970 and 2012, the rural share of manufacturing output doubled, exceeding urban production. However, this growth didn't translate to more jobs. In fact, the rural share of manufacturing jobs declined. This suggests a shift towards more capital-intensive manufacturing in rural areas, creating fewer employment opportunities. The construction sector presents a contrasting picture. The rural share of construction output increased moderately, but the employment share rose significantly (10%). This indicates faster job growth in construction compared to manufacturing. When it comes to services, rural areas seem to be losing ground. After 2004, their share of service sector output dropped significantly, reaching only 25.9% by 2012. This suggests a growing gap between rural and urban areas in service-based professions.

Government Initiatives for improving IT Infrastructure in Rural India

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[6] The share of Net domestic product and workforce contributed by rural regions to overall India NDP and workforce.

In recent years, the Government of India (GOI) has recognized the crucial role of Information Technology (IT) infrastructure in bridging the digital divide and fostering socio-economic development in rural India.

BharatNet Project

- Launched in 2017, this ambitious project aims to connect all Gram Panchayats (village councils) with high-speed optical fiber networks. As of March 2024, over 1.8 lakh Gram Panchayats have been connected.

Pradhan Mantri Gramin Digital Literacy Mission (PMGDL M)

- Launched in 2016, this scheme aims to impart basic digital literacy training to rural citizens. Over 1.5 crore individuals have been trained under the program by December 2023.

Increased Spending on IT Infrastructure:

- **Budgetary Allocation:** The government has significantly increased its budgetary allocation for the Department of Telecommunications (DoT) in recent years. The DoT budget for 2023-24 was ₹53,880 crore (US$ 7.2 billion), a 15% increase over the previous year.

- **Digital India Flagship Mission**: Launched in 2015, this umbrella program has allocated substantial resources for improving rural IT infrastructure. The total expenditure under Digital India crossed ₹6 lakh crore (US$ 80 billion) by March 2023

Initiatives like Pradhan Mantri Schools for Rising India (PM SHRI) and Saakshar Bharat Mission are not just about education; they're building a future workforce equipped for the digital age. As digital literacy rises and people become comfortable with technology, the demand for internet-based services like e-commerce, online education, and telemedicine will soar. This creates a fertile ground for managed service providers to offer solutions like cloud storage, data analytics, and cybersecurity.

The Indian government's multi-pronged approach is laying a strong foundation for a digital revolution in rural India. Initiatives like BharatNet, PMGDL Mission, are rapidly expanding IT infrastructure, while PM SHRI and Saakshar Bharat Mission are fostering a more tech-savvy rural population. This confluence of factors will create a surge in demand for IT infrastructure services. As internet penetration deepens and digital literacy rises, a vast new market will emerge for these services.

Private Sector contribution in enhancing the IT infrastructure in rural India

While the government lays the groundwork for IT infrastructure in rural India, the private sector plays a crucial role in driving its growth and creating opportunities for IT service providers. Many IT and IT-enabled services (ITES) companies are exploring expansion to Tier 2 and 3 cities. This is driven by factors like lower operational costs, readily available talent, and government incentives. Companies like Infosys, TCS, and Wipro have established campuses in Tier 2 cities like Mysore, Indore, and Bhubaneswar. Additionally, smaller IT

companies are increasingly setting up operations in these locations. This expansion creates a demand for improved internet connectivity, data centers, and network security solutions. Local IT infrastructure and managed service providers can cater to these needs.

Several BPOs are setting up operations in rural areas, attracted by a large talent pool and government subsidies. Companies like Aegis and WNS have rural BPO centers. The government is encouraging PPPs for developing IT infrastructure in rural areas. Private companies can invest in building and managing fiber optic networks, data centers, and other critical infrastructure. Private companies are partnering with government programs like PMGDL M to provide digital literacy training in rural communities by providing the required IT infrastructure and managed services. This creates a more tech-savvy population, increasing demand for IT services.

The private sector's growing focus on Tier 2 & 3 cities, the rise of rural BPOs, and collaboration with government initiatives are driving the demand for IT infrastructure and managed services in rural India. This presents a significant opportunity for service providers to develop innovative solutions, cater to a new market segment, and contribute to bridging the digital divide.

Payment Devices

India is witnessing a phenomenal rise in digital payments, rapidly transforming the financial landscape. This surge is driven by a potent combination of government initiatives, infrastructure development, and a growing ecosystem of players.

Government Initiatives:

Jan Dhan Yojana
- Launched in 2014, this scheme provides basic bank accounts to the unbanked population. As of February 2024, over 46 crore (460 million) Jan Dhan accounts have been opened.

Digital India Mission
- Launched in 2015, this flagship program aims to create a "cashless society" by promoting digital payment adoption. The initiative focuses on infrastructure development, awareness campaigns, and financial inclusion

Unified Payments Interface (UPI)
- Developed by the National Payments Corporation of India (NPCI), UPI is a revolutionary platform enabling instant interbank money transfers through mobile apps. Its simplicity and ubiquity have been key drivers of digital payments adoption.

BHIM App
- Launched by the government, BHIM is a user-friendly mobile app that allows easy access to UPI services. This has helped bridge the digital divide and empower people with basic feature phones to participate in the digital payments ecosystem.

Aadhaar Enabled Payment System (AEPS)
- This system leverages Aadhaar, a unique biometric identification system, for cashless transactions at micro ATMs in rural areas. This has improved financial inclusion for the unbanked and underbanked population.

Infrastructure Development:

- <u>Jan Dhan-Aadhaar-Mobile (JAM) Trinity:</u> This framework leverages existing infrastructure – bank accounts (Jan Dhan), unique identity numbers (Aadhaar), and mobile phones – to facilitate secure and efficient digital transactions.
- <u>Increased Internet Penetration:</u> Improved internet connectivity, particularly in rural areas, is crucial for digital payment adoption. Initiatives like BharatNet aim to bridge the digital divide.
- <u>Point-of-Sale (PoS) Infrastructure:</u> The government incentivizes the deployment of PoS terminals in small shops and businesses, making digital payments accessible to a wider audience.

Driving Digital Transformation:

Merchant Onboarding	Digital Transactions for Government Services
• Government initiatives incentivize businesses to adopt digital payment methods by offering fee waivers and cashback schemes. This has significantly increased the acceptance of digital payments across various sectors.	• The government encourages citizens to pay taxes, utility bills, and other dues electronically, creating a strong use case for digital payments.

Demand for Payment Devices:

- <u>Increased Digital Transactions:</u> The volume of digital transactions in India has grown exponentially. As per the RBI, digital transactions reached a staggering 13,462 crore in FY 2022-23, up from 2,071 crore in FY 2017-18. This growth surge necessitates a wider range of payment devices.
- <u>UPI's Dominance:</u> As per NPCI, UPI recorded over 83.75 billion transactions in FY 2023. This signifies the immense popularity and reach of UPI in India. It has emerged as the most popular digital payment method in India. Its compatibility with various mobile wallets and banking apps allows for seamless transactions using smartphones, a ubiquitous device even in rural areas.
- <u>Card Adoption:</u> Debit and credit cards continue to play a vital role, particularly for online transactions and larger purchases. Increased financial inclusion has led to a rise in debit card usage.
- <u>Small Business Adoption:</u> Small businesses have embraced digital payments due to convenience, faster settlements, and reduced cash handling costs. UPI and QR code payments have been particularly beneficial for micro-merchants who can now accept cashless payments easily.
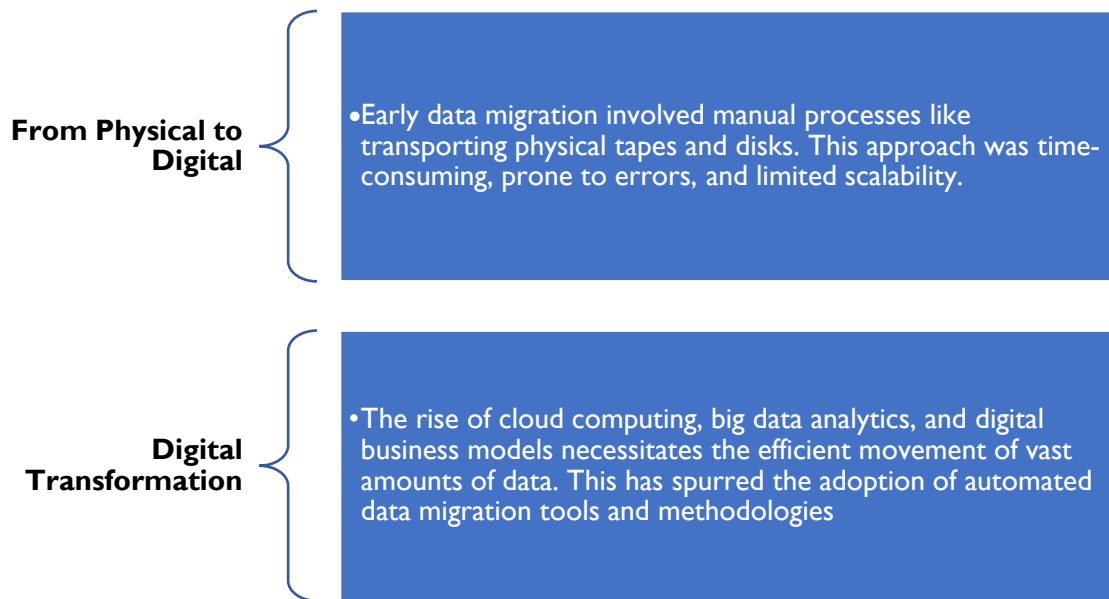
The government's relentless push for digital payments, coupled with the development of a robust infrastructure and ecosystem, has significantly transformed India's financial landscape. The increasing adoption of digital payment devices by individuals and businesses across urban and rural areas signifies a paradigm shift towards a cashless future. As digital payment solutions continue to evolve and offer greater convenience and security, their penetration is expected to soar further, fostering financial inclusion and economic growth in India.

Data Migration

Data migration, the process of transferring data from one storage system to another, has undergone a significant shift in India. Traditionally, data resided on physical media like tapes and disks. However, the digital revolution has driven a massive migration towards cloud-based and digital storage solutions. This shift presents a growing demand for data migration services.

Evolution of Data Migration:

From Physical to Digital
- Early data migration involved manual processes like transporting physical tapes and disks. This approach was time-consuming, prone to errors, and limited scalability.

Digital Transformation
- The rise of cloud computing, big data analytics, and digital business models necessitates the efficient movement of vast amounts of data. This has spurred the adoption of automated data migration tools and methodologies

Driving Forces for Data Migration Services:

- Government Initiatives: India's "Digital India" mission emphasizes digitalization across various sectors. This promotes cloud adoption and data center consolidation, driving the need for secure and efficient data migration services.
- Compliance Requirements: Regulations like the Data Protection Bill necessitate robust data security practices. Data migration services ensure compliance by facilitating the secure transfer of sensitive data to secure cloud environments.
- Business Process Optimization: Companies are migrating data to the cloud to optimize operations, improve data accessibility, and benefit from scalability and cost-effectiveness.
- Evolving Technologies: As technologies like artificial intelligence and machine learning become more prevalent, the need for efficient data migration to support these applications grows.

Government Facilitation:

- Digital Infrastructure Development: The government is investing in building a robust digital infrastructure, including high-speed internet connectivity. This facilitates faster and more reliable data transfer processes.

- Skilling Initiatives: Government programs are focusing on developing a skilled workforce for the IT sector, including data migration specialists. This ensures the availability of qualified professionals to manage data migration projects.

Adoption by Businesses:

- Data migration is not limited to a single sector. Businesses of all sizes, from finance and healthcare to manufacturing and retail, are increasingly utilizing data migration services to leverage the benefits of cloud computing and digital transformation

  Across Industries

- By adopting data migration services, businesses can migrate their data securely and efficiently, minimizing downtime and ensuring business continuity

  Improved Efficiency

- Reputable data migration service providers offer robust security protocols, protecting sensitive data during the transfer process.

  Enhanced Data Security

The digital revolution in India has transformed data migration from a manual process to a critical element of digitalization. Government initiatives, evolving technologies, and the growing need for secure and efficient data movement are driving the demand for data migration services. As businesses across industries embrace the cloud and digital transformation, the future of data migration in India is bright, offering significant opportunities for service providers in this dynamic market.

Experience Zones

The Indian retail landscape is undergoing a paradigm shift, moving from purely transactional stores to immersive experiences. Enter experience zones – interactive spaces designed to engage all five senses and create a deeper connection between brands and consumers.

Factors Fuelling the Growth of Experience Zones in India:

Shifting Consumer Preferences

- Indian consumers, particularly millennials and Gen Z, seek engaging experiences that go beyond just buying a product. They value authenticity, personalization, and a connection with the brand story.

Rising Disposable Income

- As disposable incomes increase, consumers are willing to spend more on experiences that add value and create lasting memories.

Digital Natives

- Growing digital adoption has fueled a demand for interactive experiences that mirror the online world

Demand Drivers for Experience Zones:

- Brand Differentiation: Experience zones provide a unique platform for brands to differentiate themselves from competitors. They can showcase product functionalities, highlight brand values, and create a lasting impression.

- Increased Customer Engagement: Interactive elements and engaging activities lead to higher customer engagement, fostering brand loyalty and advocacy.

- Data Collection and Insights: Experience zones allow brands to collect valuable customer data through interactive elements. This data can be used to personalize future interactions and tailor product offerings.

Current Examples of experience zones operating in India:

• Customers can experience the latest VR technology and features of their phones. These stores also offer personalized consultations and workshops	• These centers offer interactive tutorials on product usage, live demonstrations, and personalized consultations. They foster a sense of community and brand trust.	• This immersive experience allows visitors to explore the Kia BEAT car through virtual reality and interactive displays, providing a unique way to engage with the product.
Samsung Experience Stores	Amway Experience Centers	KiaBEAT360

Experience zones are poised for significant growth in India. With increasing urbanization, rising living standards, and a growing tech-savvy population, the demand for engaging and interactive experiences will

continue to rise. Brands across various sectors – from automobiles and electronics to fashion and beauty – are likely to embrace this trend to enhance their customer connect.