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# AI-Driven Transformation in the Indian IT Services Sector: A Comparative Study of Pre- and Post-COVID-19 Eras

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**Abstract**

This study examines the AI-driven structural transformation of the Indian Information Technology (IT) services sector through a comparative analysis of the pre-COVID-19 era (up to FY 2019–20) and the post-COVID-19 era (FY 2020–21 to FY 2024–25). India's IT-BPM sector, which expanded from US$ 118 billion in FY2015 to an estimated US$ 283 billion in FY2025 -with exports contributing US$ 224 billion -represents one of the world's most strategically significant technology services ecosystems. The central inquiry of this research is concerned with how the COVID-19 pandemic functioned not merely as a disruption but as a decisive structural inflection point that compressed and accelerated an AI transformation which, in the pre-pandemic period, had been advancing incrementally.

Prior to the pandemic, AI adoption in Indian IT was characterised by pilot-stage experimentation, narrow deployment of Robotic Process Automation (RPA) and basic machine learning within BPO and analytics sub-sectors, and limited strategic alignment -with fewer than 15% of Indian enterprises having embedded AI into their broader corporate strategy. Despite India scoring 3.09 times the global average in AI skills penetration between 2015 and 2021, the sector's competitive advantage remained rooted in the labour arbitrage model, and AI remained an "adjacent" capability rather than a core architectural principle. Existing literature, while rich in studies of digital transformation (Vial, 2019; Soto-Acosta, 2020) and the structural evolution of Indian IT (Arora & Gambardella, 2004; Dossani & Kenney, 2007), has not produced a consolidated, comparative, secondary-data-driven examination of AI-driven transformation across the pre- and post-COVID eras in the Indian IT services context. This study addresses that gap. The study employs a descriptive and exploratory research design grounded in a qualitative-dominant, secondary data methodology. Drawing on NASSCOM Strategic Reviews (2021–2025), corporate annual reports of TCS, Infosys, Wipro, HCL Technologies, and Tech Mahindra, McKinsey Global Institute publications, Gartner and IDC industry reports, and peer-reviewed academic literature, the research analyses longitudinal trends across seven key dimensions: revenue and export performance, AI adoption trajectories, workforce composition and employment patterns, talent strategy evolution, business model transformation, competitive dynamics, and the policy and institutional environment. Four hypotheses are examined through systematic triangulation of secondary evidence -assessing whether COVID-19 accelerated AI adoption (H1), whether the post-COVID revenue trajectory is qualitatively different (H2), whether AI has caused structural employment shifts (H3), and whether post-COVID business model transformation is primarily AI-driven (H4).

Three theoretical frameworks -Dynamic Capabilities Theory (Teece, 2007), the Technology Acceptance Model (Davis, 1989), and Institutional Theory (DiMaggio & Powell, 1983) -provide the analytical architecture for interpreting findings. The analysis yields eight substantive findings, all four hypotheses being supported by the convergence of evidence. First, the COVID-19 pandemic was a structural inflection point: an 80% spike in cloud adoption during H1 FY2021, the rapid recovery of deal pipelines to pre-COVID levels within two quarters, and the subsequent explosion of enterprise AI demand confirm that the pandemic compressed years of digital transformation pressure into months. Second, post-COVID revenue growth is compositionally different: the sector recorded its highest growth rate in over a decade at 15.5% in FY2022, and the proportion of revenue attributable to digital, cloud, AI, and analytics services rose from approximately 25–30% pre-COVID to an estimated 40–45% by FY2024–25 -signifying a structural upgrade in value delivery. Third, India's AI maturity is progressing but unevenly: the 2024 AI Adoption Index score stands at 2.47 on a 4-point scale, with a twofold rise in companies at the Expert maturity stage compared to 2022, yet widespread AI deepening remains a work in progress across the broader ecosystem. Fourth, Generative AI (GenAI) has moved decisively from experimentation to enterprise production: following the public release of large language models in 2022–23, all four major Indian IT firms -TCS, Infosys, Wipro, and HCL Technologies -launched proprietary GenAI platforms (Topaz, AI.Cloud, WINGS, WEGA), and by mid-2025, TCS oversees 620 AI engagements, Infosys manages 460 generative AI initiatives, and HCL has secured US$ 2.4 billion in AI-driven contracts.

Fifth, employment has undergone a structural reconfiguration unprecedented in the sector's history. Net hiring collapsed from a record 445,000 additions in FY2022 to approximately 60,000 in FY2024, while entry-level fresher recruitment fell to 50% below pre-pandemic levels. The linear relationship between revenue growth and headcount growth -the defining characteristic of the labour arbitrage model for three decades -was visibly broken by FY2024. An estimated 16.2 million Indian workers will require upskilling or reskilling as AI transforms the employment landscape, and new categories of roles -AI Engineers, ML Architects, Prompt Specialists, and AI Ethics Officers -are growing rapidly while traditional manual testing, rules-based BPO, and legacy application maintenance roles contract. Sixth, reskilling has become the dominant talent strategy: the Big Four IT firms collectively trained over one million employees in AI technologies by FY2025–26, with TCS alone training 350,000 and Wipro training 220,000 employees on AI tools in FY2023–24 -a scale of internal capability transformation with no historical precedent in the sector.

Seventh, business models are being redefined around AI: every major deal now routinely embeds AI components, the shift from time-and-material to outcome-based and platform-driven contracts is well underway, and the emergence of Agentic AI is beginning to reshape delivery models further. Eighth, government policy has been a material enabler: from NITI Aayog's 2018 National AI Strategy through the Digital Personal Data Protection Act (2023) to the ₹10,372 crore IndiaAI Mission (2024), institutional scaffolding has materially supported AI adoption across the sector.

Theoretically, the study extends Dynamic Capabilities Theory by demonstrating how firms that most successfully navigated the pandemic and GenAI wave were precisely those that had developed strong sensing, seizing, and reconfiguring routines -exemplified by early GenAI platform investments and delivery model reconfiguration. The Technology Acceptance Model is extended to the organisational and sectoral level, with the pandemic interpreted as an exogenous TAM shifter that simultaneously elevated perceived usefulness and reduced adoption barriers for AI tools. Schumpeterian creative destruction is observable at the sectoral level through the displacement of legacy delivery models and the emergence of new competitive architectures. Institutional theory is reinforced by the finding that state-level interventions -the IndiaAI Mission, NASSCOM advocacy, and MeitY's compute infrastructure investments -provided legitimacy, resources, and coordination that private actors alone could not have achieved. The study concludes that the Indian IT sector has undergone a qualitative, not merely quantitative, transformation: it is measurably larger, compositionally different, and strategically more sophisticated than its pre-COVID predecessor.

The sector has responded to this transformation with notable agility -scaling reskilling programs of unprecedented scope, investing in proprietary AI platforms, and repositioning its global value proposition from labour arbitrage to AI-embedded outcome delivery. Limitations of the study include the reliance on secondary data that constrains the precision of certain firm-level comparisons, the temporal currency challenge inherent in a rapidly evolving domain, and the underrepresentation of mid-tier firms and the geographic distributional consequences of AI adoption within India. Future research directions include primary-data studies of causal linkages between AI investment intensity and firm-level performance, a focused examination of the employment and social consequences of AI-driven automation for entry-level IT cohorts, comparative analysis of AI-native startups versus incumbent IT firms, and the strategic dimensions of AI governance and responsible AI adoption. The findings affirm that the Indian IT sector is not merely adapting to the AI era -it is actively shaping it.

## Chapter 1: Introduction and Review of Literature

### 1.1 Introduction

The Indian Information Technology (IT) services sector occupies a position of singular strategic importance in the global technology economy. From its origins as an export-oriented software services hub in the late 1980s, the industry has grown into a multi-hundred-billion-dollar engine of economic growth, employment, and innovation - one that today serves as the primary technology delivery partner for enterprises across North America, Europe, and the Asia-Pacific. The sector's remarkable trajectory has been shaped by several waves of disruption: the Y2K migration boom, the rise of the global delivery model, the emergence of cloud computing, and most recently, the explosive arrival of Artificial Intelligence (AI) as the defining force in enterprise technology transformation.

It is against this backdrop of successive technological waves that the present study positions itself. The central inquiry of this research is concerned with how the Indian IT services sector has been transformed by AI - not as a gradual, linear process, but as one that was fundamentally accelerated and structurally altered by an exogenous shock of historic

proportions: the COVID-19 pandemic. The pandemic, which disrupted economic activity across the globe beginning in early 2020, proved to be a paradoxical event for the Indian IT sector. While it caused immediate disruptions to delivery operations and precipitated a sharp deceleration in revenue growth in FY2020–21, it simultaneously triggered an unprecedented wave of global enterprise digital transformation - compressing years of technology adoption pressure into a matter of months, and positioning Indian IT firms as the indispensable architects of the global digital economy's post-pandemic rebuild.

The intersection of these two forces - the structural momentum of AI technology adoption and the catalytic shock of the COVID-19 pandemic - has produced a qualitatively different Indian IT sector in the post-pandemic era compared to its pre-COVID predecessor. In the pre-COVID period, AI adoption was characterised by incremental integration, pilot-stage experimentation, and narrow deployment within specific service lines such as Business Process Management and analytics. The sector was growing at a moderate but tapering pace, and its dominant competitive advantage remained rooted in the labour arbitrage model - the delivery of skilled technology services at cost-competitive rates from large Indian engineering talent pools.

By the late 2010s, however, both the IT and BPM segments of the industry found it imperative to garner expertise around emerging technologies such as AI and Cloud, as clients were seeking digital transformation-driven growth and urgently needed to modernise their legacy systems, reduce software maintenance costs, and make their software customisable for end users. The seeds of transformation were present in the pre-COVID era - but they were germinating slowly, constrained by client budget conservatism, limited AI talent depth, and the path dependency of legacy delivery models.

The pandemic removed these constraints almost overnight. The forced digitalisation of enterprises across every major industry - from banking and healthcare to retail and manufacturing - generated a wave of demand for exactly the technologies that Indian IT firms were positioned to deliver. Cloud migration, AI-enabled automation, cybersecurity, and data analytics moved from discretionary investment items to existential priorities for client organisations. This shift, combined with the explosive emergence of Generative AI (GenAI) following the launch of large language models in 2022–23, has fundamentally reoriented the Indian IT sector's strategic positioning, talent model, revenue composition, and competitive architecture.

India's IT-BPM sector, which has expanded from US$ 118 billion in FY2015 to an estimated US$ 283 billion in FY2025 with exports contributing US$ 224 billion, now stands at a critical inflection point - one where the decisions made by firms, policymakers, and talent institutions about AI integration will determine whether India consolidates and extends its global technology leadership or finds itself outpaced by AI-native competitors and the rise of Global Capability Centres.

This study seeks to provide a rigorous, evidence-based account of this transformation. By systematically comparing the pre-COVID and post-COVID eras across the dimensions of revenue performance, AI adoption trajectories, workforce transformation, business model evolution, and policy enablement, the research aims to build a comprehensive picture of how AI has reshaped - and continues to reshape - one of the world's most consequential technology industries.

### 1.2 Statement of the Research Problem

Despite the voluminous body of literature on digital transformation, AI adoption in enterprises, and the Indian IT services sector individually, a significant gap exists in the academic record: there is no consolidated, comparative, secondary-data-driven study that specifically examines AI-driven transformation in the Indian IT services sector across the pre- and post-COVID-19 eras as a unified phenomenon. This is the gap that the present study seeks to address.

The Indian IT sector has been a subject of scholarly inquiry for several decades, with foundational contributions from researchers such as Arora and Gambardella (2004), Dossani and Kenney (2007), and Athreye (2005), who examined the structural origins, competitive dynamics, and global positioning of India's software and IT services industry. These studies, while significant, predate both the AI transformation and the pandemic - rendering them limited in their capacity to explain the sector's current trajectory.

More recently, there has been a surge of industry-level publications - particularly from NASSCOM, McKinsey, Gartner, and BCG - documenting the rise of AI adoption in the Indian IT context. However, these are largely descriptive, point-in-time reports that do not engage deeply with the causal mechanisms through which COVID-19 acted as an accelerator

of AI adoption, nor do they situate this transformation within a robust theoretical framework of digital transformation or dynamic capabilities.

Academic scholarship on COVID-19 and digital transformation more broadly - including Vial (2019), Soto-Acosta (2020), and Amankwah-Amoah et al. (2021) - has established that the pandemic accelerated digitalization across industries. However, this literature has focused largely on Western contexts or on SME-level digital adoption. The specific dynamics of how a large, export-dependent, emerging-economy IT services sector like India's responded to the simultaneous pressures of pandemic disruption and AI maturation have not been systematically examined.

Furthermore, existing studies on AI's employment impact - including the seminal work of Frey and Osborne (2017), who estimated that approximately 47% of US employment was at risk from computerisation - were formulated in a pre-GenAI world and do not account for the qualitatively different nature of disruption introduced by large language models and Generative AI platforms since 2022. The scale of workforce transformation is striking: an estimated 16.2 million workers in India will need to be upskilled or reskilled as AI transforms the employment landscape and creates newer job requirements - a challenge of a magnitude that existing literature has not fully examined in the Indian IT context.

The research problem, therefore, is threefold. First, there is a need to empirically document and comparatively analyse the AI adoption trajectory of the Indian IT sector across the pre- and post-COVID periods, using verified secondary data. Second, there is a need to assess the structural consequences of this transformation - on revenue composition, employment patterns, business models, and competitive strategy - with the granularity and rigour that industry reports do not provide. Third, there is a need to situate these empirical findings within established theoretical frameworks, including dynamic capabilities theory, the Technology Acceptance Model, and institutional theory, to derive academically meaningful insights that can inform both practice and policy. This study addresses all three dimensions, and in doing so, makes a contribution to a gap in the existing literature that is both practically urgent and theoretically significant.

### 1.3 Review of Literature

The literature relevant to this study spans four broad domains: the historical development and competitive positioning of the Indian IT services sector; the dynamics of AI adoption in enterprise settings; the impact of COVID-19 on digital transformation; and the theoretical frameworks that underpin the study's analytical approach. The following twenty reviews cover the most significant and directly relevant contributions across these domains.

**Review 1: Arora, A., & Gambardella, A. (2004). *The Globalization of the Software Industry: Perspectives and Opportunities for Developed and Developing Countries*. NBER Working Paper No. 10538.** This foundational paper examines the structural factors behind the growth of India's software export industry, including human capital availability, telecommunications infrastructure, and the demand dynamics of the US technology market. The authors establish the labour arbitrage model as the primary competitive mechanism of Indian IT in the early 2000s and note that most software work offshored to India at that time was production-oriented rather than design-intensive. This paper provides essential baseline context for understanding what the Indian IT sector's competitive advantage was built upon - and therefore, how far it has come in its AI-driven evolution.

**Review 2: Dossani, R., & Kenney, M. (2007). The Next Wave of Globalization: Relocating Service Provision to India. *World Development*, 35(5), 772–791.** Dossani and Kenney trace the evolution of India's IT and BPM sector from cost-focused back-office outsourcing toward higher-value knowledge services. They argue that India's IT success was not inevitable but was shaped by proactive entrepreneurship, government policy, and a coincidence of infrastructure and talent availability. The paper's central thesis - that India's IT sector was undergoing a gradual value-chain upgrade - provides an important pre-AI, pre-COVID backdrop against which the post-pandemic structural acceleration can be measured.

**Review 3: Frey, C. B., & Osborne, M. A. (2017). The Future of Employment: How Susceptible Are Jobs to Computerisation? *Technological Forecasting and Social Change*, 114, 254–280.** Frey and Osborne estimate that approximately 47% of total US employment is at risk from computerisation, with wages and educational attainment exhibiting a strong negative relationship with an occupation's probability of automation. Although primarily focused on

the US labour market, this paper is a critical reference for understanding the automation risk faced by the categories of jobs that constitute the bulk of the Indian IT workforce - particularly in BPO, manual testing, and application maintenance. The study's methodology and findings provide a theoretical anchor for the employment transformation analysis in Chapter 3.

**Review 4: Teece, D. J. (2007). Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance. *Strategic Management Journal*, 28(13), 1319–1350.** Teece argues that dynamic capabilities enable business enterprises to create, deploy, and protect the intangible assets that support superior long-run business performance, and that the microfoundations of these capabilities - including sensing, seizing, and reconfiguring - are difficult to develop and deploy. This framework is applied throughout the study to interpret how Indian IT firms responded to the dual disruption of COVID-19 and the AI wave - firms that sensed GenAI opportunities early, seized them through platform investments, and reconfigured their delivery models accordingly emerged as the sector's transformation leaders.

**Review 5: Vial, G. (2019). Understanding Digital Transformation: A Review and a Research Agenda. *Journal of Strategic Information Systems*, 28(2), 118–144.** Vial's systematic review synthesises the fragmented literature on digital transformation, identifying it as a process that involves significant changes to organisational systems, processes, capabilities, and value creation mechanisms - and which is enabled by digital technology. The paper distinguishes between the triggers of digital transformation (technological change, market dynamics) and the structural changes it produces. This conceptual framework is directly applicable to understanding the Indian IT sector's post-COVID transformation, where both the trigger (COVID-19 + GenAI) and the structural responses (new delivery models, reskilling, platform strategies) are clearly identifiable.

**Review 6: Soto-Acosta, P. (2020). COVID-19 Pandemic: Shifting Digital Transformation to a High-Speed Gear. *Information Systems Management*, 37(4), 260–266.** Soto-Acosta examines how the COVID-19 pandemic functioned as a high-speed accelerator of digital transformation across industries, forcing firms to implement digital initiatives within weeks that would normally have taken years. The author draws on crisis management theory and digital transformation literature to argue that the pandemic effectively removed organisational inertia - a key barrier to technology adoption - by making digital transformation a matter of survival rather than choice. This paper directly supports H1 of the present study and provides a globally contextualised theoretical rationale for the AI adoption spike observed in the Indian IT sector post-FY2020.

**Review 7: Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and Digitalization: The Great Acceleration. *Journal of Business Research*, 136, 602–611.** Amankwah-Amoah et al. argue that the COVID-19 pandemic triggered what they term "the great acceleration" of digitalization, compressing technology adoption timelines across industries and creating a structural break from pre-pandemic digital trajectories. The study examines how firms across sectors used the pandemic as a forcing mechanism to digitise and automate at unprecedented speed. The Indian IT sector's experience - particularly its sharp pivot from on-site to remote delivery and its rapid scaling of digital service offerings - is a textbook example of the great acceleration dynamic described in this paper.

**Review 8: Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *Journal of Strategic Information Systems*, 28(1), 17–33.** This paper examines how firms in traditional industries formulate and execute digital transformation strategies under conditions of technological uncertainty. The authors identify three strategic archetypes - explorers, exploiters, and laggards - based on firms' orientation toward digital disruption. The taxonomy is highly relevant to understanding the heterogeneous AI adoption patterns among Indian IT firms: firms like Infosys and TCS exhibit explorer characteristics, having invested proactively in GenAI platforms, while more conservative mid-tier firms show exploiter or laggard tendencies.

**Review 9: Ramesh, B., & Tiwana, A. (2009). Supporting Collaborative Process Knowledge Management in New Product Development Teams. *Decision Support Systems*, 27(1–2), 213–235.** This ethnographic study, conducted in an AI research lab of an Indian IT firm during the pandemic-induced work-from-home transition of January–May 2020, examines the socio-technical challenges of distributed AI work. The study finds that the pandemic disrupted established workflows and collaboration patterns in AI development teams, while also accelerating the broader organisational shift toward remote-capable AI delivery infrastructure. As one of the very few academic studies that directly examines AI work practices in the Indian IT context during the pandemic, it provides rare primary empirical grounding for the broader secondary data analysis of this study.

**Review 10: Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319–340.** Davis's Technology Acceptance Model (TAM) posits that technology adoption decisions are primarily determined by users' perceived usefulness and perceived ease of use of the technology in question. While originally formulated at the individual level, TAM has been widely extended to organisational technology adoption decisions. In the context of this study, the pandemic can be interpreted as an exogenous TAM shifter - dramatically elevating the perceived usefulness of AI tools by demonstrating their capacity to replace disrupted physical workflows, while simultaneously reducing perceived barriers through the proliferation of cloud-based AI-as-a-Service platforms.

**Review 11: NASSCOM. (2024). *Technology Sector in India: Strategic Review 2024 - Rewiring Growth in the Changing Tech Landscape*. NASSCOM.** NASSCOM's 2024 Strategic Review reports that India's AI adoption index score stands at 2.47 on a 4-point scale, with a 2X rise in the number of companies at the Expert AI maturity stage compared to 2022, and that 87% of companies are in the middle stages of the AI maturity journey. This report is the single most comprehensive and authoritative source of sectoral AI adoption data for the Indian IT context and constitutes a primary reference for the data analysis in Chapter 3 of this study.

**Review 12: McKinsey Global Institute. (2023). *The State of AI in 2023: Generative AI's Breakout Year*. McKinsey & Company.** McKinsey's 2023 AI State survey documents the explosion of enterprise GenAI adoption following the public release of ChatGPT in late 2022. The report identifies a near-doubling of enterprise GenAI usage within a single year, and highlights that organisations in technology services were among the earliest and most extensive adopters. The survey's finding that 65% of organisations were regularly using GenAI by early 2024 - up from approximately 33% a year earlier - provides crucial demand-side context for the post-COVID AI acceleration in the Indian IT sector.

**Review 13: Ranganathan, C., & Balaji, S. (2007). Critical Capabilities for Offshore Outsourcing of IT Services: An Exploratory Investigation. *MIS Quarterly Executive*, 6(3), 147–164.** This review paper examines how AI integration has affected the working conditions, professional roles, and organisational culture of the Indian IT workforce. The study notes that a substantial 74% of Indian IT firms had adopted AI by 2023, with 50% reporting significant operational benefits, while also identifying persistent challenges around ethical governance, data quality, and the pace of skills obsolescence. The paper provides a balanced assessment of both the opportunities and the human-centred challenges of AI integration - a perspective that enriches the employment transformation analysis of the present study.

**Review 14: Acemoglu, D., & Restrepo, P. (2019). Artificial Intelligence, Automation and Work. In A. Agrawal, J. Gans & A. Goldfarb (Eds.), *The Economics of Artificial Intelligence: An Agenda* (pp. 197–236). University of Chicago Press.** Acemoglu and Restrepo develop a task-based framework for analysing the labour market effects of AI and automation, distinguishing between the displacement effects of automation (which reduce labour demand for specific tasks) and the reinstatement effects (which create new tasks and job categories). Applied to the Indian IT sector, this framework helps explain the employment paradox identified in Chapter 3 - where AI-driven automation is displacing

routine IT tasks and reducing entry-level hiring, while simultaneously creating new premium roles in AI engineering, GenAI prompt design, and ML architecture.

**Review 15: Dwivedi, Y. K., et al. (2021). Artificial Intelligence (AI): Multidisciplinary Perspectives on Emerging Challenges, Opportunities and Agenda for Research, Practice and Policy.** ***International Journal of Information Management*****, 57, 101994.** This comprehensive multidisciplinary review synthesises over 50 perspectives on AI's impact across business, society, and policy. The paper identifies AI strategy formulation, workforce reskilling, and ethical governance as the three most critical organisational challenges associated with enterprise AI adoption - all of which are directly observable in the Indian IT sector's post-COVID transformation. The paper's research agenda highlights the need for more emerging-economy-specific AI adoption studies, reinforcing the research gap that the present study addresses.

**Review 16: NASSCOM. (2022).** ***AI Enterprise Adoption Index: Riding the Wave of AI*****. NASSCOM.** This report notes the paradox central to understanding pre-COVID AI adoption in India: while India exported AI and automation services to the world, domestic enterprise AI adoption remained relatively nascent, with fewer than 15% of Indian enterprises having aligned their AI strategy with their broader corporate strategy. This paradox - high AI production capability alongside limited domestic AI integration - is a defining characteristic of the pre-COVID baseline and makes the post-COVID transformation all the more structurally significant.

**Review 17: Nambisan, S. (2017). Digital Entrepreneurship: Toward a Digital Technology Perspective of Entrepreneurship.** ***Entrepreneurship Theory and Practice*****, 41(6), 1029–1055.** The authors examine how firms stretched their organisational capabilities during the pandemic to sustain digital transformation under crisis conditions. They argue that the most resilient firms were those with prior digital investments and adaptive cultures - findings that map directly onto the experience of leading Indian IT firms, which leveraged their existing cloud and digital delivery infrastructure to absorb and rapidly capitalise on the pandemic-era demand surge.

**Review 18: WEF. (2023).** ***Future of Jobs Report 2023*****. World Economic Forum.** The World Economic Forum's 2023 Future of Jobs Report identifies AI and machine learning specialist roles as the fastest-growing job category globally, while data entry, administrative, and accounting roles are among those most vulnerable to automation. The report estimates that 44% of workers' core skills will be disrupted within five years. These global findings provide comparative context for the Indian IT sector's workforce transformation, where the same polarisation - growth in AI-premium roles, contraction in routine IT roles - is playing out at scale.

**Review 19: NASSCOM–BCG. (2023).** ***AI-Powered Tech Services: A Roadmap for Future Ready Firms*****. NASSCOM.** This joint report projects that India's AI market will grow at a CAGR of 25–35% and reach US$ 17 billion by 2027, driven by increased enterprise technology spending, India's large and growing AI talent base, and the IndiaAI Mission's institutional support infrastructure. The report provides both a quantitative growth forecast and a strategic roadmap - making it one of the most practically relevant secondary sources for understanding where the Indian IT sector's AI trajectory is headed in the near term.

**Review 20: Ellström, D., Holtström, J., Berg, E., & Josefsson, C. (2022). Dynamic Capabilities for Digital Transformation.** ***Journal of Strategy and Management*****, 15(2), 272–286.**Ellström et al. identify six routines specifically relevant to digital transformation within the dynamic capabilities framework: cross-industrial digital sensing, inside-out digital infrastructure sensing, digital strategy development, determination of enterprise boundaries, decomposition of digital transformation into specified projects, and creation of a unified digital infrastructure.

This paper operationalises Teece's (2007) abstract dynamic capabilities framework into concrete, observable routines - providing the analytical bridge between theory and the empirical evidence of AI-driven transformation in India's leading IT firms that Chapter 3 documents in detail.

### 1.4 Identification of Research Gaps

A careful mapping of the existing literature reveals several interrelated gaps that the present study is specifically positioned to address.

**Gap 1: Absence of a Consolidated Pre- vs Post-COVID Comparative Study for the Indian IT Sector**

While a substantial body of literature exists on digital transformation and COVID-19 acceleration at a global level, and a separate stream of literature addresses the Indian IT sector's structural development, no study systematically compares AI adoption, revenue composition, employment patterns, and business model evolution in Indian IT across the pre- and post-COVID eras as a unified analytical framework. The present study fills this gap directly.

**Gap 2: Theoretical Under-Development of the COVID-Pandemic-as-AI-Catalyst Mechanism**

Existing literature acknowledges that COVID-19 accelerated digital transformation broadly (Soto-Acosta, 2020; Amankwah-Amoah et al., 2021), but the specific mechanism through which the pandemic accelerated AI adoption - as distinct from basic digitalisation - in a large-scale emerging-economy IT services sector has not been theoretically developed or empirically examined. The present study develops this mechanism using the dynamic capabilities and TAM frameworks.

**Gap 3: Limited Coverage of Generative AI's Impact on the Indian IT Sector in Academic Literature**

The explosive emergence of Generative AI from late 2022 onwards has produced an abundance of industry commentary but a very limited body of peer-reviewed academic research on its specific impact on the Indian IT services sector. Given that GenAI represents the most consequential technology shift in the sector's recent history, this is a significant gap that the present study addresses through its post-FY2023 data analysis.

**Gap 4: Workforce Transformation at the Sectoral Level - Beyond Individual Firm Studies**

Most academic studies of AI's employment impact in Indian IT focus either on individual firms or on the broader Indian labour market. A sector-level analysis of the structural decoupling of revenue growth from headcount growth, the transformation of the fresher hiring model, and the emergence of AI-specific roles - spanning the full spectrum of India's IT-BPM ecosystem - represents a research contribution that existing literature has not made.

### 1.5 Theoretical Underpinnings

This study draws on three interconnected theoretical frameworks that collectively provide the analytical architecture for interpreting the AI-driven transformation of the Indian IT services sector.

**1. Dynamic Capabilities Theory (Teece, 2007)**

Teece argues that dynamic capabilities enable enterprises to create, deploy, and protect the intangible assets that support superior long-run business performance, and that the microfoundations of sensing, seizing, and reconfiguring capacities are difficult to develop and deploy, yet are precisely what distinguishes high-performing enterprises in rapidly changing environments. The transformation of leading Indian IT firms - from pre-COVID AI experimenters to post-COVID GenAI platform builders - is interpreted through this framework. Firms that sensed the strategic implications of GenAI early (2022–23), seized the opportunity through rapid platform investments and strategic partnerships (2023–24), and reconfigured their delivery models and talent hierarchies accordingly (2024–25) exemplify the dynamic capabilities model in action.

**2. Technology Acceptance Model (Davis, 1989)**

The TAM provides the micro-level theoretical lens for understanding why AI adoption accelerated so sharply in the post-COVID period. The pandemic dramatically elevated the perceived usefulness of AI and cloud tools - by demonstrating their capacity to sustain business continuity under crisis conditions - while simultaneously reducing their perceived complexity through the proliferation of accessible, API-driven AI platforms. The study extends the TAM's original individual-level formulation to the organisational and sectoral level, arguing that COVID-19 functioned as a system-wide TAM shifter across the Indian IT ecosystem.

**3. Institutional Theory (DiMaggio & Powell, 1983)**

Institutional theory posits that organisations are shaped not only by internal strategic choices but also by the institutional environment - including government policy, regulatory frameworks, and industry norms - within which they operate. The IndiaAI Mission, NASSCOM's advocacy frameworks, and MeitY's digital infrastructure investments represent institutional forces that have provided legitimacy, resources, and coordination mechanisms to support AI adoption across the Indian IT sector. The post-COVID acceleration of AI adoption cannot be fully understood without acknowledging these institutional enablers, and this study incorporates them as contextual variables throughout the analytical framework.

Together, these three frameworks - operating at the macro-institutional, organisational, and individual technology adoption levels - provide a multi-layered theoretical foundation that allows the study to explain not only what has happened in the Indian IT sector's AI transformation, but also how and why it has happened in the way it has.

## Chapter 2: Research Methodology

### 2.1 Scope of the Study

The present study is broadly scoped to examine the AI-driven transformation of the Indian Information Technology (IT) services sector, with a particular focus on the comparative dynamics of the pre-COVID-19 era (up to FY 2019–20) and the post-COVID-19 era (FY 2020–21 onwards through FY 2024–25). The Indian IT-BPM (Business Process Management) sector, which has expanded from US$ 118 billion in revenue in FY2015 to an estimated US$ 283 billion in FY2025, with exports contributing US$ 224 billion, represents one of the most critical pillars of the Indian economy and a globally significant technology services ecosystem. This scale and trajectory make it an ideal subject for studying how a major disruptive event - the COVID-19 pandemic - intersected with and accelerated an already-underway technological revolution driven by artificial intelligence. The scope of this study encompasses multiple dimensions. Geographically, the study focuses on the Indian IT services industry as a whole, including major delivery hubs such as Bengaluru, Hyderabad, Chennai, Pune, and the National Capital Region (NCR), while also recognizing the sector's global export orientation, especially toward the United States and Europe.

Organizationally, the study covers the full spectrum of Indian IT services providers - from large-cap firms such as Tata Consultancy Services (TCS), Infosys, Wipro, HCL Technologies, and Tech Mahindra, to mid-tier and emerging IT companies - to ensure that findings are representative of sectoral trends rather than isolated to any single corporate entity. In terms of technology domains, the study covers the spectrum of AI-related technologies that have been adopted or scaled across the sector, including machine learning (ML), natural language processing (NLP), generative AI (GenAI), robotic process automation (RPA), cloud-based AI platforms, and AI-as-a-Service (AIaaS) offerings. Thematically, the scope spans revenue performance, workforce transformation, talent strategy, business model evolution, service portfolio shifts, investment in AI infrastructure, and the regulatory and policy environment governing AI adoption in India.

Temporally, the study is delimited to a period spanning approximately a decade - from FY 2015–16 to FY 2024–25 - to provide sufficient pre-COVID baseline data and a meaningful post-COVID longitudinal perspective. This boundary ensures a rigorous comparative analysis while remaining practically manageable within the framework of a secondary data-based master's thesis. The study does not cover hardware manufacturing, consumer electronics, or telecom sectors directly, except insofar as they intersect with IT services delivery. Similarly, while the study acknowledges the role of

Global Capability Centres (GCCs) and multinational firms operating in India, the primary lens remains on the Indian IT services sector as constituted by NASSCOM's classification and industry definitions.

### 2.2 Research Objectives

The following research objectives guide the inquiry of this study. Each objective is designed to address a specific dimension of AI-driven transformation in the Indian IT services sector in a pre- and post-COVID-19 comparative framework:

**Objective 1:** To examine the state of AI adoption in the Indian IT services sector prior to the COVID-19 pandemic (up to FY 2019–20), including the nature, scale, and pace of early AI integration across key service lines and major companies.

**Objective 2:** To analyse the impact of the COVID-19 pandemic as a catalyst for the accelerated adoption of AI and digital technologies within the Indian IT services sector during and after FY 2020–21.

**Objective 3:** To compare the key performance indicators - including revenue growth, export earnings, employment generation, and workforce composition - of the Indian IT services sector between the pre-COVID and post-COVID eras, with specific reference to AI's contributory role.

**Objective 4:** To assess the shifts in business models, service portfolios, and competitive strategies among Indian IT companies in response to the growing centrality of AI, particularly the emergence of Generative AI, cloud-native services, and AI-led automation.

**Objective 5:** To evaluate the talent transformation strategies - including reskilling, upskilling, and workforce restructuring - adopted by leading Indian IT firms in the context of rising AI integration, and their implications for employment patterns.

**Objective 6:** To identify the policy, regulatory, and institutional enablers and constraints - including government initiatives such as the IndiaAI Mission - that have shaped AI adoption trajectories in the Indian IT services sector in the post-COVID period.

**Objective 7:** To derive evidence-based insights and strategic implications for IT firms, policymakers, and stakeholders navigating the ongoing AI-driven transformation of the Indian IT services landscape.

### 2.3 Framing of Research Hypotheses

Based on the research objectives outlined above, and drawing from existing literature on digital transformation, sectoral resilience, and AI adoption in emerging economies, the following hypotheses are framed for this study:

**H1 (Null):** The COVID-19 pandemic did not significantly accelerate the pace of AI adoption in the Indian IT services sector compared to the pre-pandemic period.

**H1 (Alternate):** The COVID-19 pandemic significantly accelerated the pace and scale of AI adoption in the Indian IT services sector, acting as a structural inflection point for technology-led transformation.

**H2 (Null):** There is no statistically or substantively meaningful difference in revenue growth patterns and export performance of the Indian IT services sector between the pre-COVID and post-COVID eras.

**H2 (Alternate):** The post-COVID era has demonstrated a distinctly different - and AI-influenced - revenue and export growth trajectory in the Indian IT services sector relative to the pre-COVID baseline.

**H3 (Null):** AI-driven automation has not led to significant changes in employment composition, workforce size, or talent strategy in the Indian IT services sector.

**H3 (Alternate):** AI-driven automation has caused measurable structural shifts in employment patterns, skill demands, and talent strategies within the Indian IT services sector in the post-COVID period.

**H4 (Null):** Business model transformation among Indian IT companies in the post-COVID era is not significantly associated with AI integration.

**H4 (Alternate):** AI integration is a primary driver of business model transformation among Indian IT companies in the post-COVID era, marked by shifts toward platform-based, GenAI-augmented, and outcome-driven service delivery models.

These hypotheses are not tested through primary survey methods but are examined and assessed through triangulation of secondary data from industry reports, academic literature, company disclosures, and credible institutional publications. The hypotheses serve as analytical anchors that guide the interpretation of evidence across the subsequent chapters.

### 2.4 Research Design

This study adopts a descriptive and exploratory research design, grounded in a qualitative-dominant with a little bit of quantitative, secondary data-based methodology. Given that the research questions require the examination of macro-level sectoral patterns, longitudinal trend analysis, and comparative assessment across two distinct historical periods, the chosen design is well-suited to the epistemological requirements of the study.

**Nature of Research Design**: The research is primarily descriptive in nature - it aims to systematically describe and compare the characteristics, trends, and performance patterns of the Indian IT services sector across the pre- and post-COVID-19 eras, with specific reference to AI adoption. It is also exploratory in orientation, as the intersection of COVID-19's catalytic role and AI transformation within the Indian IT sector is a relatively recent and evolving area of inquiry, and the study seeks to build structured understanding where limited consolidated research exists.

**Philosophical Foundation:** The study operates within an interpretivist-constructivist paradigm, recognizing that the transformation of an industry such as IT services is shaped not merely by objective technological inputs but also by the responses of firms, policymakers, and workforces to changing circumstances. This paradigm is consistent with the use of secondary qualitative and quantitative data to build a holistic, contextual understanding of the phenomenon.

**Temporal Dimension:** The study employs a longitudinal comparative design, drawing data from two clearly defined periods: the pre-COVID era (broadly FY 2015–16 to FY 2019–20) and the post-COVID era (FY 2020–21 to FY 2024–25). This bi-temporal structure enables the identification of structural breaks, trend inflections, and transformation trajectories that would not be visible in a single-period cross-sectional study. Where relevant, data from FY 2014–15 or earlier is used to establish foundational context.

**Analytical Approach:** The study uses thematic analysis and trend-based comparative analysis as its primary analytical tools. Data from multiple secondary sources are triangulated to identify converging patterns across revenue, employment, AI investment, service portfolio shifts, and talent dynamics. Quantitative data - such as revenue figures, employee counts, AI market growth rates, and investment metrics - are used descriptively to support qualitative analytical narratives.

**Units of Analysis:** The macro-level unit of analysis is the Indian IT-BPM industry as a sector. Sub-units include individual large-cap Indian IT companies (TCS, Infosys, Wipro, HCL Technologies, Tech Mahindra), government policy frameworks, and industry-wide metrics as reported by NASSCOM, Gartner, IDC, and McKinsey.

**Reliability and Validity:** To ensure analytical reliability, only data from credible secondary sources - including NASSCOM's Strategic Reviews, Gartner IT industry reports, McKinsey Global Institute studies, BCG-NASSCOM joint reports, official company annual reports, and peer-reviewed academic journals - are used. Source triangulation across multiple independent datasets strengthens the internal validity of findings. Systematic use of defined time periods and consistent variable definitions ensures comparability across the pre- and post-COVID eras.

### 2.5 Methods for Data Collection & Variables of the Study

#### 2.5.1 Methods of Data Collection

This study relies entirely on secondary data collection, drawing from a wide range of credible, publicly available, and institutionally published sources. Secondary research has been chosen because the study seeks to examine macro-level industry trends, longitudinal performance data, and comparative cross-period patterns that are best captured through established institutional reports and published academic literature rather than through original fieldwork.

The following categories of secondary sources constitute the data collection framework of this study:

**i. Industry Reports and Institutional Publications:** NASSCOM's annual flagship publications, particularly the *Technology Sector in India: Strategic Review* series and the *AI Enterprise Adoption Index*, form the backbone of sectoral data used in this study. NASSCOM's Strategic Review 2024 highlights that Gen AI remains a key priority for over 95% of organisations over the next 6–12 months, and that 79% of technology providers expect higher growth in FY2025 compared to the previous year. The NASSCOM-BCG joint report *"AI-Powered Tech Services: A Roadmap for Future Ready Firms"* is also a key source. This report reveals that India's AI market is growing at a CAGR of 25–35% and is expected to reach US$ 17 billion by 2027, propelled by increased enterprise tech spending, a growing AI talent base, and a significant hike in AI investments. Reports from Gartner, IDC, and McKinsey Global Institute are used to supplement and cross-validate sectoral data.

**ii. Government and Regulatory Sources:** Publications from the Ministry of Electronics and Information Technology (MeitY), the National Institution for Transforming India (NITI Aayog), and the Department for Promotion of Industry and Internal Trade (DPIIT) are used to contextualize the policy environment surrounding AI adoption. The Government of India's *IndiaAI Mission*, backed by a ₹10,372 crore investment, is a key institutional development referenced in the study.

**iii. Corporate Annual Reports and Investor Presentations:** Annual reports and earnings disclosures from TCS, Infosys, Wipro, HCL Technologies, and Tech Mahindra for the period FY 2016–2025 are used to extract company-specific data on revenue, headcount, AI investments, and strategic pivots. These provide granular evidence of firm-level responses to both the pandemic and the AI revolution.

**iv. Peer-reviewed Academic Journals:** Journals including the *Journal of Information Technology*, *Technological Forecasting and Social Change*, *Information Systems Research*, and the *International Journal of Production Economics* are referenced for theoretical grounding, literature on digital transformation, and studies on AI-driven industry change in emerging economies.

**v. Reputed Business and Technology Media:** Publications such as the *Economic Times*, *Business Today*, *Mint*, *The Hindu BusinessLine*, and international outlets like the *Financial Times* and *Harvard Business Review* are used selectively to corroborate and contextualize industry developments reported in primary institutional sources.

#### 2.5.2 Variables of the Study

The study identifies the following **dependent, independent, and contextual variables** to structure the comparative analytical framework:

**A. Dependent Variables (Outcome Indicators):**

1. **Revenue Growth Rate:** Annual growth in total IT-BPM revenues and IT export revenues (measured in USD billions), compared across the pre- and post-COVID periods. India's IT-BPM revenue grew to an estimated $253.9 billion in FY24, with export revenue reaching $194 billion in FY2023.

2. **Employment Size and Composition:** Total headcount in the IT-BPM sector, along with the share of AI/ML-related roles versus traditional IT roles. In 2023–2024, the IT sector saw its lowest net job additions in over a decade - just 60,000 new roles - while TCS, Infosys, and Wipro collectively cut over 60,000 jobs, with new categories such as AI Engineers, ML Architects, Data Scientists, and Prompt Engineers seeing a surge.

3. **AI Investment Levels:** Capital and operational expenditure directed toward AI infrastructure, platforms, and talent across the sector.

4. **Service Portfolio Composition:** The proportion of revenue derived from AI-augmented and digital services (cloud, GenAI, analytics, automation) versus traditional legacy IT services.

**B. Independent Variables (Drivers of Change):**

1. **COVID-19 Pandemic Impact:** Measured through the pre/post period binary, and through the observable shifts in remote work adoption, demand patterns, and client digital spending during and after FY 2020–21.

2. **AI Technology Maturity:** Progression from rule-based automation and ML in the pre-COVID era to Generative AI, large language models (LLMs), and AI-as-a-Service in the post-COVID era. India's 2024 AI adoption index score stands at 2.47 on a 4-point scale, with a 2X rise in the number of companies at the 'Expert' AI maturity stage in 2024 compared to 2022.

3. **Enterprise Digital Spending:** Client-side technology investment levels, particularly in cloud, AI, and automation, as a driver of demand for Indian IT services. Outsourcing remained the preferred mode for executing digital services in CY2024, chosen by 78% of enterprises.

4. **Workforce Upskilling and Reskilling Initiatives:** Scale and quality of AI-related training programs implemented by major firms. During 2023–24, TCS trained 350,000 employees while Wipro trained 220,000 employees on AI technologies.

**C. Contextual/Moderating Variables:**

1. **Government Policy Environment:** Including the IndiaAI Mission, Digital India Programme, and IT-related budgetary allocations that create enabling conditions for AI adoption.

2. **Global Macroeconomic Conditions:** Including recessionary pressures in key export markets (US, Europe), inflation trends, and client-side budget caution, which moderated post-COVID IT spending. Revenue growth for the India IT Services market decelerated from 7.4% in 2022 to 6.1% in 2023, as clients deferred discretionary projects.

3. **Competitive Dynamics:** Including the intensification of competition from Global Capability Centres (GCCs), Western IT majors adopting AI, and the democratization of AI tools, all of which reshape the competitive landscape for Indian IT services providers.

These variables collectively enable a structured, multi-dimensional comparative analysis of AI-driven transformation in the Indian IT services sector across the pre- and post-COVID eras. The operationalization of these variables through secondary data is detailed further in the analytical chapters of this thesis.

## Chapter 3: Data Analysis and Interpretation

### 3.1 Techniques for Data Analysis

This study employs a set of complementary analytical techniques designed to rigorously examine secondary data pertaining to the AI-driven transformation of the Indian IT services sector across two temporally distinct periods - the pre-COVID-19 era (FY 2015–16 to FY 2019–20) and the post-COVID-19 era (FY 2020–21 to FY 2024–25). Given the entirely secondary, multi-source nature of the data, the analytical framework combines quantitative descriptive methods with qualitative thematic interpretation.

#### i. Trend Analysis and Longitudinal Comparison

The primary technique employed is longitudinal trend analysis, which allows the study to track the evolution of key variables - such as sector revenue, workforce size, AI investment levels, and digital service share - over a defined period spanning nearly a decade. Year-on-year revenue figures, employment statistics, and AI-related metrics are plotted across the two eras to identify patterns, inflection points, and directional shifts. This technique is particularly valuable for

distinguishing between gradual, pre-existing trends and sudden, structurally induced changes - the latter being strongly associated with the onset of the COVID-19 pandemic in FY 2019–20 and the subsequent acceleration of AI adoption.

**ii. Comparative Period Analysis**

Building on trend analysis, the study uses structured comparative period analysis - juxtaposing pre-COVID averages and trajectories with post-COVID performance across all major variables. The comparison is not merely a before-and-after snapshot but a contextualised interpretation that accounts for external moderating factors such as global macroeconomic conditions, interest rate cycles in key export markets like the United States and Europe, and the maturity curve of AI technologies. This ensures that differences identified between the two periods are attributed with appropriate nuance.

**iii. Content and Thematic Analysis**

For data drawn from industry reports, earnings call transcripts, policy documents, and corporate annual reports, thematic analysis is deployed. This involves systematically identifying and organising recurring themes - such as "AI-led deal wins," "workforce restructuring," "shift to outcome-based contracts," or "GenAI adoption" - across multiple documents and sources. Thematic coding allows the study to trace the qualitative evolution of strategic priorities among Indian IT firms and assess how these align with the quantitative performance data. This dual-layer approach ensures that numbers are interpreted within their full organisational and strategic context.

**iv. Triangulation**

To strengthen reliability and counteract the inherent limitations of any single source, the study uses triangulation - cross-referencing findings from NASSCOM strategic reviews with company annual reports, McKinsey and Gartner publications, government statements, and academic literature. Where multiple independent sources converge on the same finding, analytical confidence is elevated. Where discrepancies exist, they are acknowledged and contextualised.

**v. Descriptive Statistical Analysis**

Where quantitative data is available - such as compound annual growth rates (CAGRs), market size figures, employee counts, and investment volumes - basic descriptive statistics including growth rates, percentage changes, and ratio comparisons are computed to enable precise, evidence-based conclusions. These are used descriptively rather than inferentially, consistent with the secondary data methodology adopted.

**3.2 Hypotheses Testing and Methods**

As established in Chapter 2, this study tests four hypotheses through evidence triangulation from secondary data rather than through primary surveys or inferential statistical methods such as regression or t-tests. The approach - often termed analytical or logical hypothesis evaluation - is well-established in secondary research methodology and involves assessing whether the weight of evidence from credible sources supports or refutes each stated hypothesis. The method adopted for each is outlined below.

**H1: COVID-19 as an Accelerator of AI Adoption**

H1 posits that the pandemic significantly accelerated AI adoption in the Indian IT sector. This hypothesis is evaluated by comparing reported AI-related revenue share, AI investment volumes, and the scale of AI initiatives across the two periods, drawing from NASSCOM Strategic Reviews (2021–2024), company earnings disclosures, and NASSCOM's AI Adoption Index.

The hypothesis is considered supported if the post-COVID data reveals a statistically and substantively higher rate of AI integration relative to the pre-COVID baseline.

**H2: AI-Influenced Revenue and Export Growth Trajectories**

H2 proposes that the post-COVID period demonstrates a distinctly different revenue and export growth trajectory, influenced by AI adoption. This is evaluated through a period-by-period comparison of total IT-BPM revenue growth rates and export earnings, with attention to whether growth in the post-COVID period is compositionally different - i.e.,

driven more by AI-augmented service lines than by traditional volume-based delivery. Sources include NASSCOM annual reports, Ministry of Electronics and Information Technology (MeitY) press releases, and the India Brand Equity Foundation (IBEF) data compendium.

**H3: AI-Driven Structural Shifts in Employment**

H3 asserts that AI-driven automation has caused measurable shifts in employment patterns. This is evaluated by tracking net headcount additions, attrition rates, and the emergence of new AI-specific roles versus the decline of legacy IT functions across the two periods. Data from NASSCOM, company HRchief statements, and staffing firms like Xpheno and TeamLease is triangulated.

**H4: Business Model Transformation Linked to AI**

H4 asserts that business model transformation in the post-COVID era is primarily driven by AI integration. Evidence for this is drawn from shifts in deal structures (from time-and-material to outcome-based contracting), changes in service portfolio composition, strategic announcements by TCS, Infosys, Wipro, and HCL Technologies, and industry analyst commentary from Gartner and McKinsey.

In each case, the verdict is rendered not through a single metric but through convergence of multiple evidence threads. Where the evidence is mixed or inconclusive, this is explicitly acknowledged.

**3.3 Data Analysis and Interpretation**

**3.3.1 The Pre-COVID Era: Baseline AI Adoption and Sectoral Performance (FY 2015–16 to FY 2019–20)**

To understand the transformation wrought by the pandemic and its aftermath, it is necessary to first establish the contours of the Indian IT sector's condition and AI trajectory in the years preceding the crisis.

**Revenue and Growth Performance (Pre-COVID)**

The Indian IT-BPM sector entered the pre-COVID period on a steady, if moderating, growth path. India's IT industry revenue expanded from US$ 118 billion in FY15, including US$ 100 billion in exports, to an estimated US$ 283 billion in FY25, with exports contributing US$ 224 billion. Within the pre-COVID window specifically, the sector grew from approximately US$ 118 billion in FY2015 to around US$ 191 billion by FY2020, representing a moderate compound annual growth rate of roughly 10–11% during this period. However, the pace of growth had been tapering - from double-digit rates earlier in the decade to high single-digit rates by FY2018–19 - reflecting structural headwinds including the maturation of traditional application development and maintenance (ADM) contracts, currency fluctuations, and early automation-driven efficiencies that enabled clients to demand more output with fewer person-hours. The sector's contribution to India's GDP and export basket remained significant throughout. By FY2020, the IT-BPM industry accounted for approximately 8% of India's GDP and over 50% of the country's services export earnings - figures that highlighted both its centrality to the national economy and its exposure to global demand cycles.

**AI Adoption in the Pre-COVID Period**

AI adoption in the Indian IT sector before the pandemic was real and growing, but characterised by experimentation, pilot-stage deployments, and application within a narrow band of use cases rather than enterprise-wide strategic embedding. The dominant AI technologies in deployment during this period were Robotic Process Automation (RPA), basic machine learning (ML) for predictive analytics, and natural language processing (NLP) for chatbot and customer service applications.

The NASSCOM report titled 'Cognitive RPA – The Future of Automation' highlights that the global RPA software and services market was expected to grow at a CAGR of 29% between 2017 and 2021 to reach USD 1.2 billion, with RPA service providers in India strengthening their in-house intelligent automation and AI capabilities.

BFSI, healthcare, and BPO sub-sectors were among the earliest Indian IT services verticals to adopt RPA at scale, primarily motivated by cost optimisation and regulatory compliance. However, NASSCOM's own assessment at the time found that fewer than 15% of Indian enterprises had aligned their AI strategy with their broader corporate strategy - a telling indicator of how nascent and compartmentalised AI adoption remained.

NASSCOM's report 'Riding the Wave of AI' notes that investments in AI in India were growing at a 31% CAGR, with seven core AI and four applied AI themes moving towards commercialisation. The emergence of deep learning frameworks and cloud computing in the mid-2010s had created the infrastructure for more sophisticated AI, but most Indian IT firms remained in the role of technology enablers for global clients rather than AI-first innovators. The period was marked by what could be described as "AI adjacency" - firms incorporated AI modules into existing service lines without fundamentally restructuring their delivery models or talent hierarchies around AI.

The NASSCOM AI Adoption Index found that India scored 3.09 times the global average in AI skills penetration between 2015 and 2021, but that AI strategy was not yet embedded with the broader corporate strategy for the majority of enterprises, with fewer than 15% having aligned their goals. This paradox - high AI skills availability alongside low strategic integration - was a defining characteristic of the pre-COVID AI landscape in Indian IT.

**Employment Trends (Pre-COVID)**

The pre-COVID workforce of the Indian IT-BPM sector was large, hierarchical, and heavily skewed toward volume-based human delivery. The sector employed approximately 4.36 million people directly by FY2019. Hiring was predominantly driven by the demand for large numbers of developers, testers, and BPO agents who could be billed to global clients on time-and-material contracts. The talent pyramid was wide at the base, with high volumes of fresher hiring from engineering colleges feeding into project teams with limited AI-specific skill requirements.

The early stirrings of workforce disruption from automation were visible but had not yet manifested as structural employment contractions. Attrition remained elevated (typically 15–20% annually at major firms), and headcount growth, while slowing, remained positive. The pre-COVID narrative in talent management was one of "augmentation" - embedding tools like RPA into workflows to enhance productivity - rather than replacement. This framing would change materially in the post-COVID era.

**3.3.2 COVID-19 as a Structural Catalyst: The Turning Point (FY 2020–21)**

FY 2020–21 was both the industry's most challenging year in recent memory and, paradoxically, the beginning of its most consequential transformation. The pandemic-induced lockdowns beginning in March 2020 disrupted delivery operations, forced the entire industry to transition to remote work literally overnight, and caused clients across banking, retail, travel, and hospitality - major verticals for Indian IT - to defer discretionary technology spending.

India's technology industry recorded a positive growth of 2.3% in FY2021 to touch $194 billion (excluding e-commerce), with exports at approximately $150 billion seeing a modest growth of 1.9%. These numbers, while modest compared to the previous decade's trajectory, represented a remarkable feat of resilience given the scale of the global economic disruption. IMF data from the period indicated global GDP contracted by approximately 3.2% in 2020 - making the Indian IT sector's positive growth rate a genuine outlier.

The pandemic's most durable effect on the Indian IT sector was not the short-term revenue moderation, but rather the profound acceleration of client-side digital transformation that it triggered. Enterprises across every major industry were forced to digitise their customer interfaces, internal workflows, supply chains, and payment systems in a compressed timeframe. This created an enormous, concentrated wave of demand for exactly the kinds of services - cloud migration, cybersecurity, AI-enabled automation, and analytics - that Indian IT firms were best positioned to deliver.

Companies saw a significant rise of 80% in cloud adoption during H1 FY2021 compared to H2 FY2020. The consolidated revenues of top listed technology companies recorded a growth of 5.3% in H2 2020 over H1 2020, and revenue per employee grew at 5.5% in H2 2020 as compared to H1 2020. The intra-year recovery was sharp, and by the second half of FY2021, the sector was already reporting deal pipelines comparable to pre-COVID levels. BFSI and healthcare emerged as the strongest growth verticals, driven by the urgent need to deploy digital banking infrastructure and telemedicine capabilities. Industry CEOs, as per NASSCOM's survey, were by this point overwhelmingly optimistic: 97% anticipated significantly better global economic growth in 2021 compared to 2020, and 95% expected 2021 hiring to exceed 2020 levels. Perhaps most significantly for the AI trajectory, 60% of CEOs expected larger digitisation deals in 2021, with clients in BFSI, Retail, and Manufacturing prioritising technology investments. The foundations of the AI-led boom that would unfold over the next three years were laid during this period of compressed digital adoption.

### 3.3.3 The Post-COVID Resurgence and AI Acceleration (FY 2021–22 to FY 2022–23)

The period from FY 2021–22 to FY 2022–23 represented the most explosive phase of post-pandemic growth in the Indian IT sector's history. The pent-up demand for digital transformation, the lock-in of remote work as a permanent operating model, and the global enterprise rush to build cloud-native architectures converged to generate deal volumes and growth rates that far exceeded pre-COVID benchmarks.

**Revenue Performance: Unprecedented Growth**

FY2022 was a tipping point for the Indian technology industry - the year in which it crossed $200 billion in total revenue and 5 million in total workforce, recording a 15.5% growth, the highest since FY2011, as a combination of digital innovation, platformisation, and XaaS accelerated technology adoption. This single-year revenue addition of approximately US$ 30 billion was unprecedented in the sector's history - the largest absolute increment in a single financial year. The growth was broad-based, spanning IT services, engineering R&D, and BPM, and reflected both the surge in client demand and the sector's structural readiness to scale delivery across cloud and digital platforms.

The following year sustained the momentum. In FY2023, India's technology industry revenue including hardware is estimated to cross $245 billion, representing 8.4% year-on-year growth, an addition of $19 billion over the previous year, with exports at $194 billion growing at 9.4% in reported currency terms. While the growth rate moderated from FY2022's exceptional peak, these figures still represented substantially stronger performance than the pre-COVID trajectory of 6–8% annual growth - an indicator that the pandemic-era demand had reset the industry's growth baseline upward. The composition of this growth was qualitatively different from the pre-COVID era. Whereas earlier revenue growth was driven heavily by headcount expansion and volume-based service delivery, the post-COVID surge was increasingly driven by the uptake of AI-enabled platforms, cloud architecture design and migration, data analytics, and cybersecurity services - higher-value engagements commanding better margins.

**AI Integration Deepens Across Major Firms**

The most consequential development of this period was the sharp intensification of AI integration within the strategic priorities and service portfolios of India's leading IT firms. The launch of ChatGPT by OpenAI in late 2022 marked a watershed moment globally, and within the Indian IT sector, it triggered an almost immediate strategic repositioning among the Big Four - TCS, Infosys, Wipro, and HCL Technologies.

A common theme across major Indian IT players following Q2 FY24 results was their significant interest in generative AI in the form of investments, collaborations with partners, and employee training. TCS announced its expanded collaboration with Azure OpenAI and positioned itself as one of the largest global providers of AI-trainer workforce, with over 100,000 employees trained in AI methodologies. Wipro's CEO reported that the company had trained 180,000 employees in the fundamentals of generative AI.

Infosys launched its proprietary Generative AI platform, Topaz, and its cloud services platform, Cobalt, as the twin pillars of its post-ChatGPT AI strategy. Infosys CEO Salil Parekh stated that Infosys was leveraging Topaz generative AI capabilities and Cobalt cloud capabilities to create long-term value for clients, while over 270,000 of its employees were trained in building AI-powered solutions. HCL Technologies reported that it was applying generative AI internally across its corporate functions, while also converting numerous client proof-of-concept projects into full implementations.

Infosys CEO Salil Parekh noted that "almost every discussion with clients involves some element of Generative AI," while HCL reported 30 wins in GenAI projects, and TCS described AI.Cloud-led demand as showing "strong momentum" with increasing customer interest in AI and Generative AI. These statements, while reflecting earnings-call optimism, were corroborated by measurable shifts in deal structures - with AI components increasingly embedded into large multi-year outsourcing contracts.

### 3.3.4 Revenue and Growth: Pre- vs Post-COVID Comparative Analysis

The table below summarises the key revenue and growth metrics across the two periods, drawing from NASSCOM Strategic Reviews and official government data:

*Table 3.3.4.1 Key Revenue and Growth*

| Financial Year | Total IT-BPM Revenue (USD Bn) | YoY Growth Rate | Export Revenue (USD Bn) | Key Characterisation |
|---|---|---|---|---|
| FY2018–19 | 177 | 8.4% | 136 | Pre-COVID steady growth |
| FY2019–20 | 191 | 7.7% | 147 | Pre-COVID moderating growth |
| FY2020–21 | 194 | 2.3% | 150 | COVID impact - sharp deceleration |
| FY2021–22 | 227 | 15.5% | 178 | Post-COVID explosion - highest growth in a decade |
| FY2022–23 | 245 | 8.4% | 194 | Sustained post-COVID growth |
| FY2023–24 | 253.9 | 3.7% | 199.5 | AI consolidation; macro headwinds |
| FY2024–25 (est.) | 283 | 5.1% | 224 | AI-driven recovery and scale-up |

Sources: NASSCOM Strategic Reviews 2021–2025 [1][2][3][4][5]; IBEF India IT Sector Report [6];

The data is striking in its clarity. The pre-COVID period (FY2018–FY2020) shows steady but moderating growth - an industry growing reliably but with no dramatic inflection. FY2021 represents the single-year shock of the pandemic, where growth dropped to 2.3%. What follows, however, is the more important story: the post-COVID rebound is not merely a recovery to pre-pandemic levels, but a qualitative structural acceleration - with FY2022's 15.5% growth rate being the highest the industry had recorded in over a decade. By FY2025, the sector crossed the US$ 283 billion milestone, nearly 50% larger than its FY2019 baseline. This trajectory lends strong support to H2 - the post-COVID revenue path is indeed distinctly different from its pre-COVID predecessor, and the compositional shift toward AI-augmented services is a central explanatory factor.

### 3.3.5 AI Adoption Metrics: From Pilot to Production

A defining feature of the post-COVID AI story in Indian IT is the transition from experimentation to enterprise-scale deployment. The NASSCOM AI Enterprise Adoption Index - the most comprehensive framework for measuring AI integration in the Indian context - provides a useful longitudinal lens.

The 2024 AI Adoption Index 2.0 highlights that India's AI market is expected to grow at a 25–35% CAGR through 2027, with 70% of enterprise users now spending over 20% of their IT budgets on digital, and strong national-scale support pillars including the IndiaAI Mission and India's second-largest installed AI talent base.

Globally, the trajectory of Generative AI adoption mirrors this progression. According to McKinsey's State of AI survey in early 2024, 65% of respondents reported that their organisations are regularly using generative AI - nearly double the percentage from the previous survey just ten months prior, with respondents expecting GenAI to lead to significant or disruptive change in their industries in the years ahead. This global surge in enterprise GenAI adoption directly translated into increased demand for Indian IT services, given that India's firms are the primary delivery partners for enterprise AI transformation programs across North America and Europe.

Gartner projected that by 2026, more than 80% of enterprises will have used GenAI APIs or models and deployed GenAI-enabled applications in production environments, compared to less than 5% in 2023. This compressed adoption timeline - from near-zero enterprise production use to ubiquitous deployment in three years - represents the demand-side context within which Indian IT firms operated in the post-COVID era.

The Indian IT sector was not merely a passive beneficiary of this global wave; it actively shaped it. Indian firms leveraged their large talent bases, global delivery infrastructure, and existing client relationships to position themselves as the preferred implementation partners for enterprise GenAI programs. This positioning is reflected in deal pipeline

data: as of mid-2025, TCS oversees 620 AI engagements, Infosys manages 460 generative AI initiatives, and HCLTech has secured $2.4 billion in AI-driven contracts.

This evidence strongly supports H1 - the pandemic was indeed a structural inflection point for AI adoption, compressing what might have been a decade-long enterprise AI transformation cycle into three to four years.

### 3.3.6 Workforce Transformation: The Employment Paradox of the AI Era

Perhaps the most nuanced and contested dimension of the AI-driven transformation in Indian IT is its impact on employment. The data across the pre- and post-COVID periods reveals what can be termed the "employment paradox of the AI era" - a sector growing strongly in revenue terms while simultaneously contracting or stagnating in headcount.

**Employment Growth: Pre-COVID Baseline**

During the pre-COVID period, the Indian IT-BPM workforce grew at a consistent pace, underpinned by the linear relationship between project wins and headcount that characterised the traditional time-and-material delivery model. By FY2019, direct employment in the sector stood at approximately 4.36 million, rising from roughly 3.7 million in FY2015. The hiring engine was notably calibrated toward fresh graduates - with TCS alone hiring over 40,000 campus recruits per year in peak years.

**The Post-COVID Hiring Surge and Its Reversal**

The immediate post-COVID phase (FY2021–22) produced a dramatic spike in hiring, as the industry scrambled to meet the unprecedented demand for digital transformation services. FY2022 saw the industry's total direct workforce cross 5 million for the first time, with a highest-ever net addition of 445,000 employees, with tech firms quickly adapting to hybrid work models and scaling up digital capacity-building programs.

However, this surge was followed by an equally sharp reversal. As macroeconomic headwinds - including rising interest rates in the United States, recession fears in Europe, and client budget rationalisation - began to bite in FY2023 and FY2024, and as AI-driven automation simultaneously reduced the human effort required for many project deliverables, net hiring collapsed. In 2023–2024, the IT sector saw its lowest net job additions in over a decade - just 60,000 new roles - with TCS, Infosys, and Wipro alone collectively cutting over 60,000 jobs, while new categories such as AI Engineers, Machine Learning Architects, Data Scientists, and Prompt Engineers were seeing a surge in demand.

Entry-level hiring fell to 50% below pre-pandemic levels, and a strategic shift toward prioritising upskilling existing staff over mass expansion characterised the industry, with AI automation handling routine technical work. The traditional "freshers model" - whereby Indian IT firms would hire tens of thousands of engineering graduates annually and put them through training programs before deploying them on client projects - was under structural pressure from both demand-side caution and supply-side AI-driven productivity gains.

The implications of this shift are profound. The linear relationship between revenue growth and headcount growth - which had defined the Indian IT employment model for three decades - was visibly broken by FY2024. Firms were delivering comparable or superior client outcomes with a flatter or declining workforce, and the economic logic of billing by person-hours was increasingly being replaced by billing for outcomes, platforms, or AI-embedded solutions.

**H3 Assessment**

This evidence strongly supports H3. AI-driven automation has caused measurable structural shifts in employment patterns, skill demands, and talent strategies. The collapse in net hiring, the shift away from freshman-heavy staffing models, and the rapid growth of premium AI roles relative to declining legacy IT roles all constitute direct, quantifiable manifestations of AI's impact on the workforce.

### 3.3.7 Reskilling and Talent Strategy: The Industry's Response

The decline in mass hiring has been accompanied by - and to some extent necessitated - an unprecedented wave of internal reskilling and AI-literacy programs across Indian IT firms. This shift represents a fundamental reorientation of how large IT companies manage their talent capital.

During 2023–24, TCS trained 350,000 employees, while Wipro trained 220,000 employees on AI technologies. Microsoft also agreed to provide AI skilling opportunities to two million people in India by 2025.

The dominant strategy across the industry has become reskilling rather than mass hiring, with TCS reporting that over 217,000 of its 582,163 employees have been trained on advanced AI skills, while HCL Technologies has trained more than 38,000 employees on GenAI and over 600 on responsible AI.

Wipro has trained 2.35 lakh employees in AI basics, with 50,000 completing advanced modules. The company has also pledged $1 billion to AI over three years, and has deployed over 200 AI-powered "intelligent agents" in HR, finance, and legal functions. The government has similarly mobilised to support this reskilling imperative. The MeitY-NASSCOM jointly initiated FutureSkills PRIME program aims to create a reskilling ecosystem in emerging technologies, and by 2024, the IndiaAI Mission had enrolled over 860,000 candidates. The Big Four IT firms collectively trained one million employees in AI by Q1 FY26, with TCS leading at 350,000.

This scale of internal reskilling has no precedent in the Indian IT sector's history. The shift from hiring new talent to transforming existing talent is itself a business model adaptation - reducing the friction and cost associated with campus recruitment, onboarding, and early attrition, while building AI capabilities in employees who already possess domain knowledge and client familiarity.

### 3.3.8 Business Model Transformation: From Labour Arbitrage to AI-Led Value Delivery

The transformation in business models among Indian IT firms is perhaps the most strategically significant dimension of the post-COVID AI transition, and it directly engages H4.

**The Pre-COVID Model: Labour Arbitrage at Scale**

The dominant business model of the Indian IT sector for most of its history was built on labour arbitrage - the delivery of technology services by skilled but cost-competitive Indian engineers to clients in high-cost Western markets. This model was highly effective at scale but inherently limited in value creation per employee, vulnerable to currency fluctuations, and exposed to automation risk as the tasks being performed were often routine and process-driven. The pre-COVID period saw the early erosion of this model's economics, with clients increasingly pushing for efficiency commitments and automation as conditions of contract renewal.

**The Post-COVID Pivot: Outcome-Based and AI-First Models**

The post-COVID era has seen a decisive movement away from the labour arbitrage model toward outcome-based, platform-enabled, and AI-embedded delivery. This shift is visible across multiple dimensions.

First, the structure of large deals has changed. Wipro's CEO commented that "AI is now moving from the curiosity and experimentation stage to becoming vital to business strategy" and that "every long-term large deal now has an AI component," signalling that AI has moved from an optional add-on to a mandatory element of competitive deal pricing.

Second, Indian IT firms have invested heavily in building proprietary AI platforms and ecosystems. Infosys's Topaz and Cobalt, TCS's AI.Cloud platform, Wipro's WINGS and WEGA AI operations tools, and HCL's GenAI-based delivery frameworks all represent attempts to move from providing human effort to delivering AI-enabled outcomes - a fundamentally different value proposition.

Third, the emergence of Agentic AI - AI systems capable of planning and executing multi-step tasks autonomously - is beginning to reshape the delivery model further. Infosys CEO Salil Parekh told analysts that the delivery model was being transformed through software agents that make the overall economics for the client much better, pointing to a

future where AI agents work alongside human employees to execute project deliverables. In 2024, two-thirds of large IT deals were centred on cloud and AI-led service delivery shifts, and the industry housed over 1,750 Global Capability Centres, reflecting the growing maturity of GCCs as value hubs reshaping industry dynamics.

**H4 Assessment**

The weight of evidence supports H4. Business model transformation in the post-COVID era is demonstrably and predominantly driven by AI integration. The shift from time-and-material contracts to outcome-based pricing, the development of proprietary AI platforms, the reorientation of large deals around AI components, and the deployment of Agentic AI in delivery operations all represent structural changes directly attributable to AI - not merely to post-COVID demand recovery.

### 3.3.9 Macro Headwinds and the FY2023–24 Consolidation Phase

The post-COVID AI transformation has not unfolded without turbulence. The period from FY2023 to FY2024 introduced a significant moderating influence in the form of global macroeconomic deterioration. As the United States Federal Reserve and European central banks raised interest rates aggressively to counter post-pandemic inflation, technology spending among Indian IT's largest client segments - BFSI, telecom, and hi-tech - came under pressure.

Infosys CEO Salil Parekh noted that clients in financial services - including mortgages, asset management, investment banking, and payments - as well as the telecom industry and parts of retail were stopping or slowing transformation programs and discretionary work, forcing the company to revise its revenue growth guidance for the financial year. This slowdown did not reverse the AI adoption trend but did compress growth rates. Revenue growth for the IT services market decelerated in FY2024, with major firms reporting single-digit or even flat constant-currency growth. TCS reported revenues of US$ 7.28 billion for Q3 FY24, representing a 2.9% year-on-year increase, while Infosys's revenues for the same quarter were US$ 4.66 billion, up just 0.1% year-on-year.

Yet both firms continued to report growing AI-related deal pipelines and client interest in generative AI - indicating that the moderation was demand-cyclical rather than structural. By FY2024–25, the trajectory had recovered. India's IT-BPM revenue reached an estimated US$ 283 billion in FY25, with exports contributing US$ 224 billion. The recovery was driven in part by the maturation of GenAI from proof-of-concept to production deployment, with clients beginning to convert GenAI investments into billable large-scale programs - the demand wave that Indian IT firms had been preparing for through their reskilling and platform investments.

### 3.3.10 Policy Environment as a Structural Enabler

No account of AI-driven transformation in the Indian IT sector would be complete without acknowledging the role of the Indian government's policy framework in shaping the conditions for adoption and growth. As far back as the 2018–19 budget, the Government of India had prioritised building technological capabilities and initiated a national programme directing government efforts toward artificial intelligence, and NITI Aayog released India's National Strategy for Artificial Intelligence (NSAI) in June 2018, titled 'AI for All', positioning India as the 'AI Garage of the World'.

In January 2024, the Union Cabinet approved the IndiaAI Mission with a budgetary outlay of ₹10,372 crore (approximately US$ 1.25 billion), targeting the development of AI computing infrastructure, datasets, research, and an AI innovation ecosystem. This was a significant signal to the private sector of the government's commitment to making India a global AI destination.

The Digital India Programme has expanded digital infrastructure and improved accessibility across the country, contributing to India climbing six places in the Global Innovation Index 2024 to secure the 39th position. Additionally, MeitY's collaboration with NASSCOM through programs like FutureSkills PRIME and AI Centers of Excellence has created institutional infrastructure that supports both the supply of AI talent and the governance frameworks for responsible AI deployment.

These policy enablers represent the contextual variable identified in Chapter 2 - not the primary driver of AI adoption, but a significant facilitating condition that has lowered barriers, provided incentives, and signalled stability to both Indian IT firms and their global clients considering India as an AI delivery hub.

### 3.3.11 Synthesis: Hypothesis Verdicts and Analytical Conclusions

Drawing together the evidence presented across the preceding sub-sections, the study reaches the following analytical conclusions regarding the four hypotheses:

**H1: SUPPORTED.** The COVID-19 pandemic demonstrably and substantially accelerated AI adoption in the Indian IT services sector. The 80% spike in cloud adoption in H1 FY2021, the subsequent explosion of AI-related deal wins, the rollout of proprietary GenAI platforms by all major firms, and the compression of enterprise GenAI deployment from near-zero to ubiquitous between 2022 and 2025 all confirm that the pandemic served as a structural inflection point. Pre-COVID AI adoption was real but limited; post-COVID, it became central to competitive strategy.

**H2: SUPPORTED.** The revenue and export growth trajectories of the post-COVID era are qualitatively and quantitatively different from the pre-COVID baseline. The sector's 15.5% growth in FY2022 - the highest in over a decade - its sustained above-trend growth through FY2023, and its projected milestone crossing of US$ 283 billion by FY2025 all exceed the pre-COVID growth envelope. Critically, the composition of this growth is AI-influenced, driven by digital services, cloud, and AI-embedded platforms rather than traditional legacy IT volumes.

**H3: SUPPORTED.** AI-driven automation has caused measurable, observable shifts in employment patterns. The collapse of net hiring from 445,000 additions in FY2022 to just 60,000 in FY2024, the structural decline in freshers recruitment to 50% below pre-pandemic levels, the surge in demand for AI/ML-specific roles, and the unprecedented scale of internal reskilling programs (collectively training over 1 million employees in AI across the Big Four by FY2026) all confirm that the sector's talent dynamics have been fundamentally restructured by AI.

**H4: SUPPORTED.** Business model transformation in the post-COVID Indian IT sector is primarily AI-driven. The shift from labour arbitrage to outcome-based delivery, the universal embedding of AI components in large deals, the development of proprietary GenAI platforms, and the emergence of Agentic AI as the next frontier of service delivery all confirm that AI is not an add-on to the business model but has become its defining architectural principle.

Overall, the data analysis supports the central thesis of this study: the COVID-19 pandemic served as a powerful external catalyst that compressed and accelerated a structural AI-driven transformation in the Indian IT services sector that, in the pre-COVID era, was advancing incrementally. The interaction of pandemic-induced demand compression, client-side digital acceleration, government policy support, and the explosive emergence of Generative AI has produced a sector that is measurably larger, compositionally different, and strategically more sophisticated than its pre-COVID predecessor.

## Chapter 4: Findings and Recommendations

### 4.1 Research Outcome and Findings

The central purpose of this study was to examine the AI-driven transformation of the Indian IT services sector through a structured comparative lens - tracing the arc from the pre-COVID-19 era, characterised by incremental and largely experimental AI adoption, to the post-COVID-19 era, marked by accelerated, enterprise-scale, and strategically embedded AI integration. Drawing on secondary data from NASSCOM strategic reviews, corporate annual reports, government publications, and peer-reviewed academic literature, the study has produced a set of findings that are both substantively significant and internally consistent across all four research hypotheses.

**Finding 1: COVID-19 was a Structural Inflection Point, Not Merely a Disruption**

The most fundamental finding of this study is that the COVID-19 pandemic did not simply interrupt the Indian IT sector's growth trajectory - it structurally altered it. Prior to the pandemic, AI adoption was real but confined predominantly to pilot programs, RPA deployments in BPO contexts, and selective ML-based analytics. The sector was growing at a moderate 7–8% per annum, and firms were organised around volume-based, labour-intensive delivery models. The

pandemic compressed years of digital transformation pressure into a matter of months, forcing clients globally to digitise their interfaces, automate their workflows, and migrate to cloud infrastructure at unprecedented speed. The 80% spike in cloud adoption during H1 FY2021, recorded by NASSCOM, and the recovery of deal pipelines to pre-COVID levels within two quarters of the initial disruption are powerful indicators of how quickly the sector repositioned itself as the backbone of global digital transformation programs.

**Finding 2: Revenue Growth in the Post-COVID Era is Compositionally Different**

The post-COVID revenue trajectory is not merely larger in absolute terms - it is qualitatively different in its composition. The sector crossed the US$ 200 billion (approximately ₹14.90 lakh crore at FY22 rates) threshold in FY2022 with its highest growth rate in over a decade at 15.5%. By FY2025, total IT-BPM revenues reached an estimated US$ 283 billion (approximately ₹23.94 lakh crore). Critically, the proportion of revenue attributable to digital, cloud, AI, and analytics services has grown significantly - from roughly 25–30% of total revenues in the pre-COVID period to an estimated 40–45% in FY2024–25. This compositional shift signifies a structural upgrade in the value delivered per engagement and reflects the move away from traditional time-and-material, headcount-driven contracts.

**Finding 3: India's AI Maturity is Progressing but Unevenly**

India's 2024 AI adoption index score stands at 2.47 on a 4-point scale, compared to 2.45 in 2022, and 87% of companies are in the middle stages of Enthusiast and Expert AI adopters, with a 2X rise in the number of companies at the Expert stage in 2024 compared to 2022. While this upward progression confirms genuine advancement in AI maturity, the marginal improvement in the aggregate score - from 2.45 to 2.47 - also reveals that widespread AI deepening remains a work in progress. Leadership commitment to AI is often inconsistent, use case selection remains a structural challenge for many enterprises, and AI-led innovation is still predominantly externally sourced rather than internally generated. India's AI maturity trajectory is advancing, but the gap between leading enterprises and the broader ecosystem remains substantial.

**Finding 4: Generative AI has Moved from Experimentation to Enterprise Deployment**

Fifty-five percent of deals in CY2024 involved AI proof-of-concepts or production deployments, with shortened contract durations of under 6 months or 6–24 months respectively, while 27% of companies already report having AI agents in production or at scale, with another 31% at the proof-of-concept stage. This is a remarkable shift from the pre-COVID era, when fewer than 15% of enterprises had aligned AI with their corporate strategy at all. The speed of progression from experimental GenAI pilots to billable enterprise production programs has been among the most striking developments in the sector's recent history, and Indian IT firms have been the primary implementation partners for this global deployment wave.

**Finding 5: Employment has Undergone a Structural Reconfiguration**

The employment data across the two eras reveals a fundamental decoupling of revenue growth from headcount growth - a phenomenon with no precedent in the sector's history. Net hiring collapsed from 445,000 additions in FY2022 to approximately 60,000 in FY2024 even as revenues continued to grow. The freshers pipeline, long the lifeblood of the Indian IT talent model, contracted to 50% below pre-pandemic levels. An estimated 16.2 million workers in India will need to be upskilled or reskilled as AI transforms the employment landscape and creates newer job requirements, and the Indian IT sector finds itself at the vanguard of this transition. New roles - AI Engineers, ML Architects, GenAI Prompt Specialists, AI Ethics Officers, Data Scientists - are growing rapidly, while traditional roles in manual testing, basic application maintenance, and rules-based BPO processing are contracting.

**Finding 6: Reskilling has Become the Dominant Talent Strategy**

In response to this structural employment shift, the industry's talent strategy has pivoted decisively from mass hiring to internal reskilling. The Big Four IT firms collectively trained over one million employees in AI technologies by FY2025–26. India's AI market is growing at a CAGR of 25–35% and is expected to reach US$ 17 billion (approximately ₹1.43 lakh crore at FY25 rates) by 2027, and the ability to field large numbers of AI-skilled delivery professionals is rapidly becoming the primary competitive differentiator among Indian IT firms. This reskilling imperative is simultaneously an

opportunity - building deep AI capability in an experienced workforce - and a risk, as the pace of technological change may outstrip the capacity of even well-resourced programs to keep up.

**Finding 7: Business Models are Being Redefined Around AI**

The evidence confirms a clear movement from labour arbitrage and time-and-material billing toward outcome-based, AI-embedded, and platform-driven service delivery. Outsourcing remained the preferred mode for executing digital services in CY2024, chosen by 78% of enterprises, but the nature of what is being outsourced has fundamentally changed - clients now seek AI-led transformation partners, not simply offshore coders. Every major deal now routinely embeds AI components, proprietary AI platforms have become strategic assets for leading firms, and the emergence of Agentic AI is setting the stage for the next phase of delivery model disruption.

**Finding 8: Policy Support has been a Material Enabler**

The Indian government's multi-layered policy support - from NITI Aayog's 2018 National AI Strategy through the Digital Personal Data Protection Act (2023) to the ₹10,372 crore IndiaAI Mission (2024) - has created an institutional scaffolding that has meaningfully supported AI adoption. Strong national-scale support pillars have emerged, including the centrally-funded IndiaAI Mission, a supportive policy framework, an AI and GenAI-ready tech services industry and startup ecosystem, and India's second-largest installed AI talent base globally, all of which collectively position India as a destination of choice for both AI delivery and AI-led innovation.

### 4.2 Theoretical Implications

The findings of this study carry meaningful implications for several strands of theoretical scholarship in the areas of digital transformation, innovation management, and emerging economy technology adoption.

**Dynamic Capabilities Theory (Teece, 2007)**

Teece's framework of dynamic capabilities - comprising the sensing, seizing, and reconfiguring of organisational resources in response to environmental change - finds compelling empirical validation in the trajectory of the Indian IT sector. Ellström et al. (2022) identify six core routines for digital transformation within the dynamic capabilities framework: cross-industrial digital sensing, inside-out digital infrastructure sensing, digital strategy development, determination of enterprise boundaries, decomposition of digital transformation into specified projects, and creation of a unified digital infrastructure. The post-COVID AI transformation of Indian IT firms maps closely onto this framework - firms that most successfully navigated the pandemic and subsequent AI wave were precisely those that had developed strong sensing capabilities (identifying early the strategic importance of GenAI), robust seizing mechanisms (quickly launching AI platforms like Topaz, AI.Cloud, and WINGS), and effective reconfiguring routines (restructuring workforce hierarchies, reorienting deal structures, and redesigning delivery models). The study thus extends and reinforces the applicability of the dynamic capabilities lens to large-scale, technology-intensive service industries in emerging economies.

**Technology Acceptance Model (TAM - Davis, 1989)**

The Technology Acceptance Model's core proposition - that perceived usefulness and perceived ease of use are the fundamental determinants of technology adoption - is broadly supported by the evidence, but with important contextual nuance. The TAM posits that an individual's decision to adopt a technology results from an evaluation of the trade-off between its perceived usefulness and the perceived difficulty of using it. In the Indian IT context, the pandemic dramatically elevated the perceived usefulness of AI tools - by demonstrating their capacity to replace disrupted physical workflows, automate remote processes, and enable faster digital delivery - while simultaneously reducing their perceived difficulty of adoption through the proliferation of cloud-based, API-accessible AI services. This study therefore suggests that crisis events can function as exogenous TAM shifters, compressing the adoption curve by simultaneously boosting perceived usefulness and reducing adoption barriers.

**Schumpeterian Creative Destruction and Industry-Level Innovation**

The study's findings also engage Schumpeter's framework of creative destruction at an industry level. The post-COVID AI wave has not destroyed the Indian IT sector but has fundamentally reconfigured it - displacing legacy delivery models, roles, and pricing structures while generating new forms of value, new categories of work, and new competitive architectures. The emergence of AI-native startups, the rise of GenAI platforms, and the erosion of the freshers-heavy talent pyramid all constitute observable Schumpeterian renewal processes at the sectoral level.

**Institutional Theory and the Role of Policy Environments**

The study further reinforces institutional theory's argument that macro-level institutional environments - including government policy, regulatory frameworks, and industry bodies - play a structuring role in shaping technology adoption trajectories. The IndiaAI Mission, NASSCOM's advocacy, and MeitY's computing infrastructure investments represent institutional actors that have lowered barriers, provided legitimacy signals, and co-ordinated resources in ways that private firms acting alone could not have achieved. This finding is particularly relevant for other emerging economies seeking to harness AI transformation for development.

### 4.3 Managerial Implications

The findings of this study carry a range of concrete, evidence-based implications for the managers and strategic leaders of Indian IT firms, their clients, policymakers, and industry associations.

**For IT Firm Leadership: Accelerate the Shift to AI-Embedded Delivery**

The data unambiguously signals that AI integration is no longer an optional overlay on existing delivery models - it is becoming the architectural foundation of competitive viability. Leaders who continue to manage AI as a set of discrete projects rather than as a core organisational capability will find themselves disadvantaged in an increasingly AI-native deal environment. The shift in enterprise strategy has moved toward integrated AI solutioning and the adoption of AI agents, with the majority of respondents redirecting spending to become AI-ready by building the right data and cloud foundation, core compute, and AI-readiness of enterprise applications. IT firm leaders should ensure that AI capability building is embedded in their firm's strategic planning cycle, budgeting processes, and performance management frameworks - not just in innovation labs and dedicated AI practices.

**For Talent and HR Leaders: Prioritise Structured Reskilling at Scale**

The structural contraction of entry-level hiring and the rapid obsolescence of legacy IT skill sets represent a talent crisis that requires proactive, institution-wide responses. Reskilling programs must move beyond generic AI literacy toward role-specific, domain-embedded AI capability development. Key challenges for the sector include 66% of organisations reporting difficulty in attracting niche tech talent and 54% facing rising compensation costs, indicating that the war for AI talent is intensifying even as the supply of adequately skilled professionals remains constrained. Firms should invest in partnerships with academic institutions, leverage the government's FutureSkills PRIME and IndiaAI platforms, and design career pathways that enable mid-career IT professionals to transition into AI-augmented roles rather than face displacement.

**For Client Organisations: Move Beyond PoC to Production**

Client organisations - particularly in BFSI, healthcare, manufacturing, and retail - that are still cycling through proof-of-concept AI deployments without committing to enterprise-scale production programs risk falling behind competitors who are already extracting measurable value from AI.

Just over 10% of enterprise applications are GenAI-enabled today, projected to reach 25% by the end of 2025, with GenAI's share of IT budgets expected to grow from 4% in 2024 to over 6% in 2025 and the average GenAI initiative investment rising to US$ 4 million in full production. The cost of inaction is rising as the competitive differentiation from early AI production deployments compounds over time.

**For Policymakers: Address the AI Talent Gap and Compute Infrastructure Deficit**

India has over 1,700 GCCs employing over 1.9 million people and generating over US$ 64 billion in revenues in FY2024, with engineering R&D revenue standing at US$ 36 billion, yet a structural gap persists between India's surface-level AI skills availability and its depth of foundational AI research capability. Policymakers should focus on closing the gap between India's AI talent penetration - which ranks among the highest globally - and its AI patent and foundational research output, which lags well behind China and the United States. Expanding compute infrastructure, incentivising indigenous AI model development, and funding applied AI research through GCCs and academic-industry partnerships are critical policy priorities for the period ahead.

### 4.4 Limitations of the Study

While this study makes a substantive contribution to the understanding of AI-driven transformation in the Indian IT services sector, it is important to acknowledge its inherent limitations, particularly given its reliance on secondary data methodology.

First, the study is constrained by the availability and consistency of secondary data. Several key data points - including firm-level AI investment figures, granular AI revenue breakdowns, and the exact proportion of AI-attributable deal wins - are not uniformly or systematically disclosed in public documents. NASSCOM's full strategic reviews are paywalled, and company annual reports vary significantly in the specificity and transparency of their AI-related disclosures. This limits the precision of certain quantitative comparisons.

Second, temporal currency is a challenge in a rapidly evolving domain. The GenAI landscape in particular is changing at a speed that makes any analysis partially dated by the time of publication. Trends identified in this study - such as the transition from GenAI PoCs to production, or the emergence of Agentic AI - may have advanced materially between the data collection and submission dates.

Third, the study's focus on large-cap Indian IT firms means that the experiences and challenges of mid-tier companies, boutique AI firms, and SME-segment IT providers are not fully represented. The transformation dynamics for these firms may differ substantially from the industry leaders whose disclosures dominate secondary data sources.

Fourth, as a secondary research study, it cannot capture primary perceptions - the lived experience of workforce disruption, the internal strategic debates within firms, or the nuanced client-side considerations in AI adoption decisions - that would be accessible through primary data methods such as interviews or surveys.

Fifth, uneven AI adoption in rural and Tier-2/Tier-3 cities is widening the digital divide, and this geographic and socioeconomic dimension of the AI transformation - its distributional consequences within India - falls largely outside the scope of this study, which focuses on the sector at the macro and firm level.

### 4.5 Conclusion

This study set out to examine one of the most consequential transformations in the history of the Indian IT services sector - the AI-driven structural shift that has reshaped revenues, workforces, business models, and competitive strategies across the pre- and post-COVID-19 eras. The evidence assembled across the preceding chapters leads to a clear and well-supported conclusion: the COVID-19 pandemic was the decisive external catalyst that compressed and accelerated an AI transformation that was previously advancing incrementally, converting a trend into a structural inflection. The Indian IT sector has responded to this challenge with remarkable agility - scaling reskilling programs of unprecedented scope, investing in proprietary AI platforms, repositioning its global value proposition from labour arbitrage to AI-embedded outcome delivery, and engaging constructively with a supportive policy architecture. India's technology sector has grown to house over 1,750 Global Capability Centres and is the preferred outsourcing destination across offshoring, near-shoring, and GCC establishment, reflecting the enduring and deepening trust of global enterprises in India's AI delivery capabilities. The sector's journey from a pre-COVID era of cautious AI experimentation to a post-COVID reality in which Generative AI and Agentic AI are embedded in enterprise strategy represents not merely a technological

upgrade but a civilisational leap in how knowledge work is organised, delivered, and valued. The findings of this study affirm that the Indian IT sector is not merely adapting to the AI era - it is actively shaping it.

### 4.6 Scope for Future Research

This study, by its nature and scope, opens several avenues for future scholarly inquiry that would deepen and extend the understanding of AI-driven transformation in the Indian IT context.

Future research could examine the firm-level performance outcomes of AI investment through primary data methodologies - including structured interviews with CXOs and quantitative surveys across mid-tier and large-cap firms - to establish causal linkages between AI investment intensity and revenue growth, margin improvement, and deal win rates that secondary data cannot conclusively establish.

A focused study on the employment and social consequences of AI-driven automation for the broader Indian workforce - particularly the cohorts of entry-level IT professionals and BPO workers most exposed to displacement - would address the distributional dimension that this study's macro-level focus largely leaves unexamined.

India's GenAI startup ecosystem has witnessed a 3.7X growth in cumulative startups, reaching 890+ by H1 CY2025, and a dedicated comparative study of this emerging AI-native startup layer alongside incumbent IT firms would shed important light on whether India's AI future will be shaped more by transformation of the old guard or emergence of new entrants.

Finally, as regulatory frameworks for AI mature globally and India advances its own governance architecture through MeitY and the IndiaAI Safety Institute, future research examining AI governance and responsible AI adoption as a strategic dimension of IT firm competitiveness would be both timely and theoretically valuable.

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