



Exploring the Dynamic Landscape of Information Technology Services

AI as a transformative force shaping technology spend and driving innovation

September 2024

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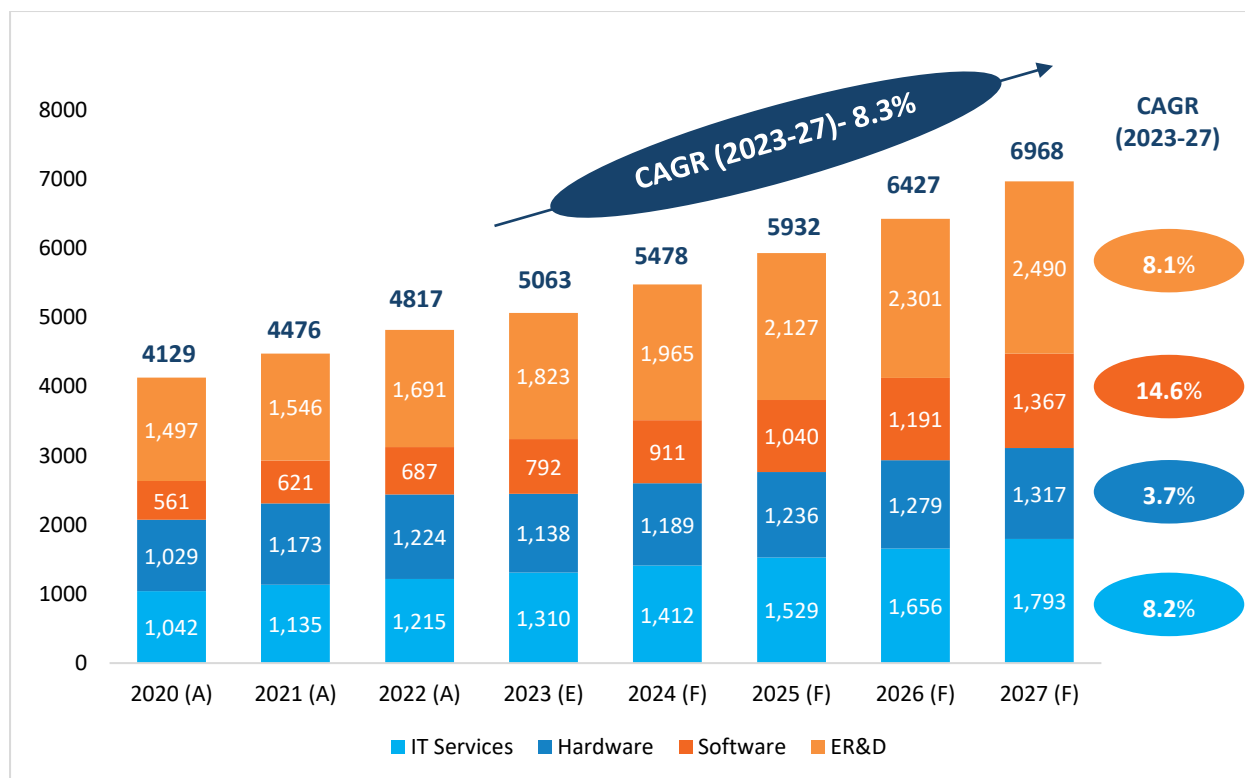
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1 Global Technology Market

1.1 Global Technology Market Spend

The Global Technology landscape continues to evolve in response to shifting workplace dynamics, digital transformation imperatives, and innovation demands. IT services, software, and ER&D segments are expected to see sustained growth, driven by a commitment to modernization and technology-driven solutions. The global technology market is expected to grow to a size of 6967.9 billion USD by 2027 at a CAGR of 8.3% (2024-27)

Exhibit 1: Global IT Market Size (CY 2020-27), in USD Billion



Source: Frost& Sullivan, Secondary Sources

IT Services demonstrated resilience and growth during and after the pandemic, and this trend is expected to persist. In recent years, IT services have seen significant increases, driven by investments in cloud services, which will remain a primary focus for technology leaders in the coming years. The momentum in this segment is projected to continue, with robust forecasts for the future. As businesses seek to modernize their IT infrastructure and digital platforms, there's a strong impetus to move away from legacy systems towards agile and efficient solutions.

As companies resume their paused projects, they are likely to allocate more resources towards technology investments to accelerate digital transformation initiatives, enhance operational efficiency, and remain competitive in the market. Moreover, with a higher number of deals expected across sectors, there will be greater demand for technology solutions and services to support various aspects of business operations, such as remote work infrastructure, cybersecurity, data analytics, and customer experience enhancement. This heightened activity is

projected to drive robust growth in technology spend as organizations prioritize leveraging technology to drive innovation, growth, and resilience.

By 2027, IT services is anticipated to reach 1793.4 billion in spending, reflecting a sustained commitment to digital transformation, growing at a CAGR of 8.2% (2023-27)

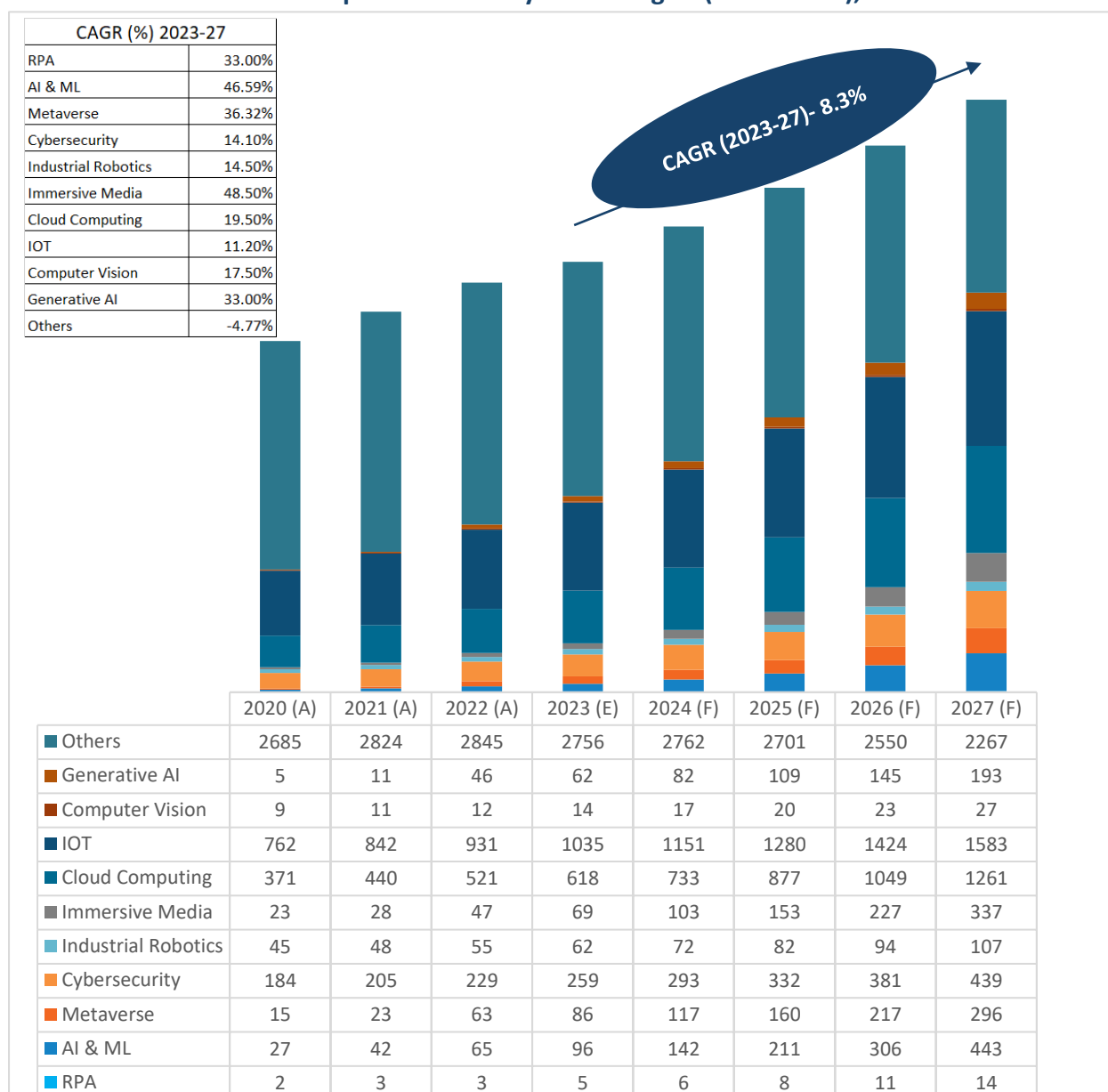
Hardware investment held steady as remote work, telemedicine, and remote learning gained prominence. However, the hardware market's growth is expected to remain sluggish in the foreseeable future. The focus in this segment is shifting towards enterprise devices that need upgrades or investments to support hybrid work settings. The hardware market is likely to experience subdued growth as large-scale investments in certain areas may not be as necessary. This segment's performance underscores the changing landscape of workplace technology needs. The segment is expected to grow at a CAGR of 3.7% (2023-27).

Software witnessed significant growth during and after the pandemic, driven by enterprises prioritizing infrastructure software expenses to support their digital transformation efforts. This trend is expected to persist as organizations continue their digital journeys. Investments in software are projected to remain robust, with enterprises aiming to enhance their digital capabilities and streamline operations. By 2027, software spending is estimated to reach 1367.4 billion USD, reflecting ongoing investments in software solutions to drive efficiency and innovation, growing at a CAGR of 14.6% (2023-27)

Engineering Research and Development (ER&D), a critical driver of innovation, is poised for sustained growth. In recent years, ER&D investments have been instrumental in technological advancements across industries. As businesses strive to stay competitive and bring innovative products and services to market, ER&D spending is anticipated to rise steadily. The growing demand for breakthrough technologies, product innovation, and digital transformation will fuel the expansion of ER&D investments. By 2027, ER&D spending is projected to reach 2,490 billion USD, highlighting its pivotal role in shaping the future of technology.

1.1.1 Global Technology Spend Across Key Technologies

Exhibit 2: Global IT Spend Across Key Technologies (CY 2020-27), in USD Billion



Source: Frost& Sullivan, Secondary Sources

The global IT spend across select key technologies is experiencing substantial growth, with a projected total spend of USD 4701 billion by 2027 (excluding Others), driven by a compelling compound annual growth rate (CAGR) of 8.31% (2023-27).

Robotic Process Automation (RPA) continues to thrive due to its cost-efficiency and automation capabilities, making it a favored choice for organizations seeking to optimize operations. The cost benefits, along with resilience-building during disruptions like COVID-19, have propelled RPA's growth. This segment is expected to exhibit a robust CAGR of 33% from 2023 to 2027.

Artificial Intelligence and Machine Learning (AI & ML) technologies play a pivotal role in performance enhancement across industries. Their ability to facilitate data-driven decision-making, automation, and predictive analytics has led to their substantial growth. Businesses are making significant strides in boosting efficiency, process optimization, and security through AI &

ML. This segment is expected to maintain a strong CAGR of 46.6% from 2023 to 2027, as it continues to redefine industries.

- **Generative AI:** It is a branch of AI that uses machine learning techniques to generate new content that adheres to the underlying patterns in a dataset. Gen AI assists in augmenting datasets for machine learning models. Generative AI is gaining prominence as it enables machines to create content autonomously, such as generating text, images, and even music. This technology is witnessing adoption in creative industries like content generation, design, and art, where AI-driven algorithms can assist or even replace human creativity. The growth of this segment at an expected CAGR of 33% (2023-27), is fueled by the need for efficient content creation, automation of repetitive tasks, and the exploration of AI-driven creativity across various domains.

Metaverse, an emerging technology, is rapidly gaining traction, with estimated spending reaching 296 billion USD in 2027, at a CAGR of 36.3% (2023 - 2027). The growth is driven by increasing interest and substantial investment in creating immersive digital environments that transcend the boundaries of physical and virtual worlds. With applications ranging from immersive gaming and virtual events to advanced training and simulations, the Metaverse is poised to revolutionize how people interact, collaborate, and entertain themselves in the digital realm.

Cybersecurity expenditure is set to rise due to ongoing cyber risks exacerbated by factors like remote work models, accelerated digital transformation, and economic volatility. Organizations are allocating more resources to safeguard their digital assets, driving steady growth in the cybersecurity sector. This segment is expected to maintain a healthy CAGR of 14.1% between 2023 and 2027.

Industrial Robotics benefits from the growing desire for automation across industries. Recent developments, such as expanded electronics manufacturing, swift robot installation, and the integration of artificial intelligence, are propelling this segment's growth. The demand for flexible and collaborative robots that can work alongside human operators is driving innovation in this field. As the industrial landscape evolves, industrial robotics segment is expected to grow at a CAGR of 14.5% (2023-27) to reach a market size of 107 billion USD by 2027.

Immersive Media experiences strong demand as consumers seek differentiated content amid disruptions like COVID-19. Virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies are transforming how people engage with digital content and experiences. The versatility and potential for innovation in immersive media make it a dynamic segment poised for substantial growth with a CAGR of 48.5% (2023-27).

Cloud Computing maintains its upward trajectory as organizations adopt a 'cloud-first' strategy, leading to increased spending on public cloud services. The scalability and flexibility of cloud infrastructure continue to attract businesses. The adoption of cloud-native technologies and DevOps practices is further accelerating the migration of applications and workloads to the cloud. As cloud providers innovate with advanced offerings such as serverless computing and AI-driven

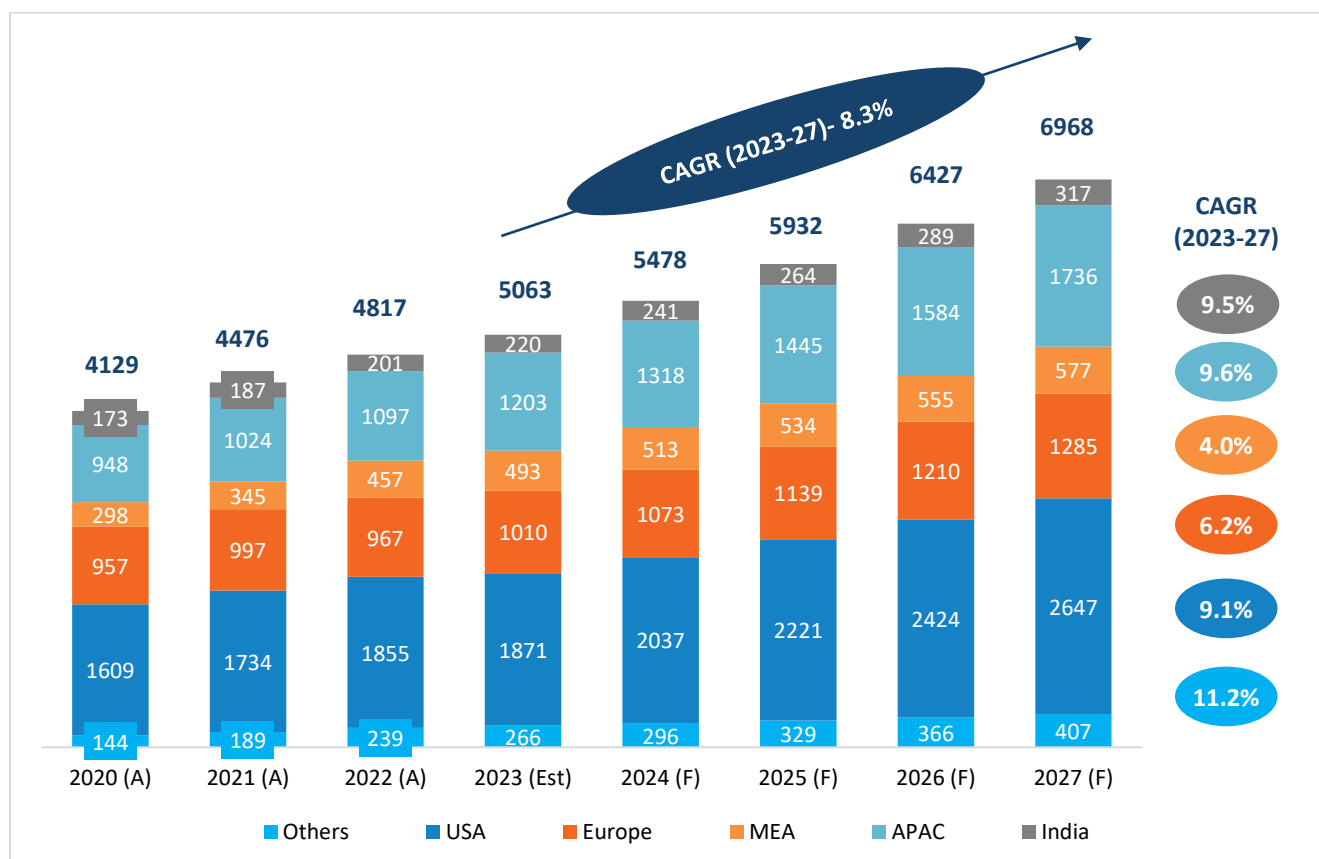
services, the market is poised for a healthy growth to reach a market size of 1261 billion USD by 2027, growing at a CAGR of 19.5% (2023-27).

Internet of Things (IoT) plays a pivotal role in enabling data-driven decisions across the industrial and consumer sectors. Post-pandemic, IoT adoption has surged, reflecting its growing importance in connecting devices and collecting valuable data. The convergence of IoT with AI and 5G connectivity is expected to open new possibilities, accelerating the growth of IoT applications across various sectors. This segment is expected to grow at a CAGR of 11.2% (2023-27) and reach a market size of 1583 billion USD by 2027.

Computer Vision is emerging as a transformative technology with broad applications. It allows machines to interpret and understand visual information from the world, enabling automation in areas like image recognition, object tracking, and autonomous vehicles. The growth of this segment at a CAGR of 17.5% (2023-27), is driven by the increasing demand for automation and enhanced visual perception in a wide range of industries.

2.8.2 Global Technology Spend Across Regions

Exhibit 3: Global IT Spending by Regions (CY 2020-27), in USD Billion



Source: Frost& Sullivan, Secondary Sources

Europe's IT sector is expected to witness significant growth, largely attributed to a strategic shift in focus towards cost control, efficiencies, and automation in response to the challenging economic landscape. This shift, coupled with a strong emphasis on cloud technologies and cloud cybersecurity, is driving IT spending upwards. The sector is also witnessing increased investments in software and IT services, with a notable trend towards cloud options, including infrastructure

as a service (IaaS), expected to grow substantially. Concurrently, there's a heightened priority on enhancing cybersecurity measures, especially in the cloud, to safeguard against emerging threats and to prepare for advancements in AI and generative AI. This focus on security is expected to see a marked increase in spending, at a CAGR of 6.21% (2023-2027)

Meanwhile, in Africa and the Middle East, there are promising developments. As per a Google-IFC report Africa's internet economy is on the rise and could reach a substantial 180 billion USD by 2025, constituting more than 5% of the continent's GDP. Additionally, Saudi Arabia has ambitious plans to invest 25 billion USD in the tech sector, signaling a strong commitment to technological advancement in the Middle East, at a CAGR of 4.01% (2023-2027)

Turning to the Asia Pacific region, China is expected to experience robust tech spending growth, with at least 7% annual increases projected from 2023 to 2027. Japan is focusing on software and IT services investments, and South-east Asia's domestic tech spending is set to grow by over 9.6% CAGR. Moreover, long-term investments in research and development (R&D) are expected to further boost tech spending in the Asia Pacific.

The increasing adoption of cloud computing, driven by advancements in cloud solutions and data management, is poised to fuel market growth. Cloud services offer numerous advantages, empowering companies to boost their profitability, thereby serving as a key driver for IT spending in the United States market.

Simultaneously, the escalation in the deployment of database management systems (DBMS) is a direct response to the exponential growth in available data for analysis. The surging demand for data services is expected to contribute significantly to the expansion of United States IT spending market. Technology spend in the region is anticipated to grow at a CAGR of 9.1% from 2023 to 2027, primarily driven by increased R&D investments

Outsourcing Opportunities in India

The IT Outsourcing market is estimated to be a USD 8.8 billion market in 2023, growing at a CAGR of 17.8% to reach USD 20 Billion by 2028. The Indian IT outsourcing market is expected to experience faster growth compared to the overall IT market. India remains the preferred destination for IT outsourcing due to its potent combination of cost advantages, a skilled English-speaking workforce, and decades of accumulated technology expertise. Sustained investment in specialized training ensures that India maintains its competitive edge in niche areas, reinforcing its position as a destination of choice for IT outsourcing.

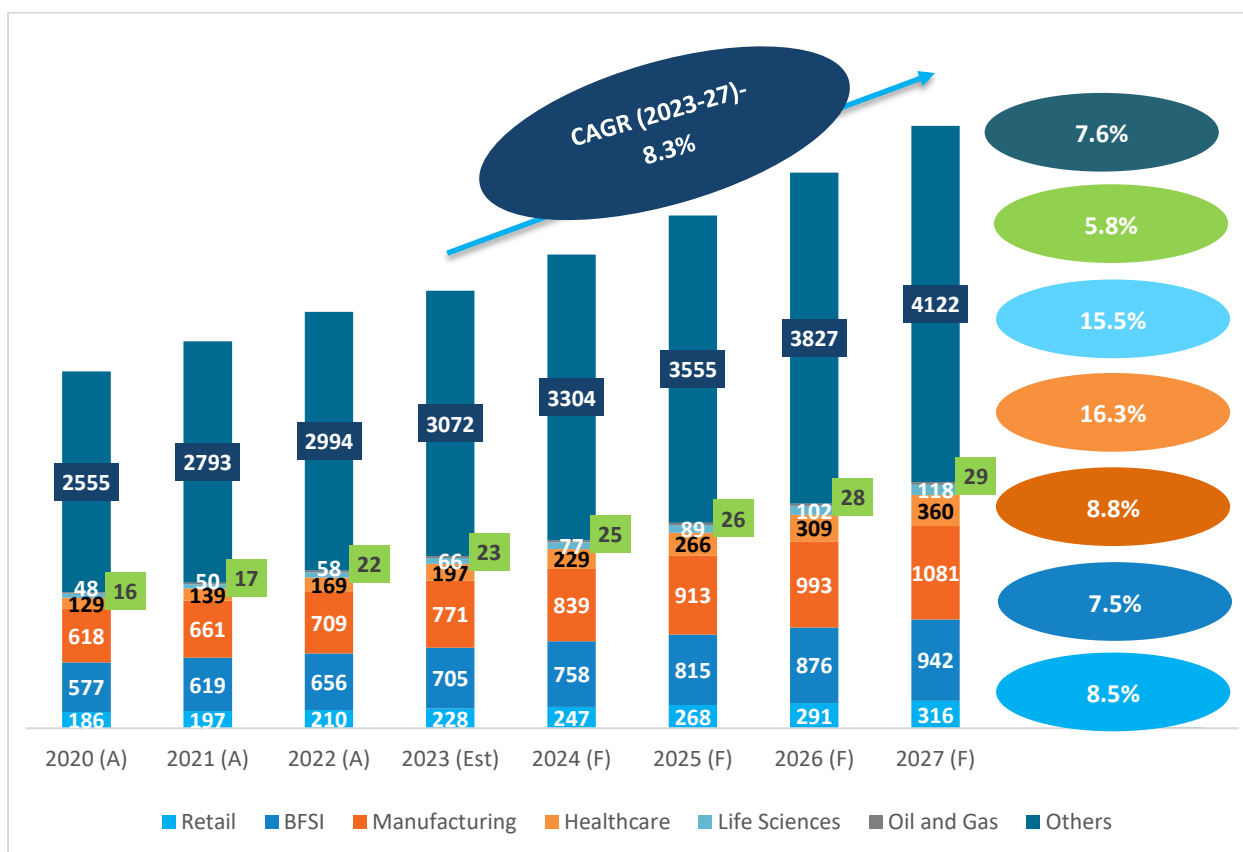
A significant trend observed in the IT Outsourcing market is the pivot towards digital transformation. Clients are actively seeking firms capable of assisting them in harnessing emerging technologies such as cloud computing, big data analytics, and artificial intelligence. Consequently, there is a growing demand for services such as software development, data migration, and system integration.

The rise of automation and AI, increased focus on data privacy and compliance, and greater use of collaborative technologies are some of the trends expected to shape the IT outsourcing industry in 2024.

1.1.3 Global Technology Spend Across Select Industry Verticals

The need to constantly innovate underscores the diverse approaches that industries are taking to leverage technology for growth, efficiency, and resilience. While some sectors were accelerated into digital transformation by the pandemic, others are adapting to emerging trends and opportunities. The outlook for technology spending across these sectors is one of innovation and adaptation, driven by the ever-evolving digital landscape.

Exhibit 4: Global IT Spending Across Industry Verticals (CY 2020-27), in USD Billion



Source: Frost& Sullivan, Secondary Sources

Retail and BFSI sectors have long recognized the importance of technology for their operations. During the pandemic, these industries further embraced digital services for business continuity, leveraging analytics and AI. This trend is expected to continue, with projected growth rates of 7.5% for BFSI and 8.5% for Retail in technology spending between 2023 and 2027. These sectors are primed to continue harnessing technology's power for customer engagement, data-driven decision-making, and operational efficiency.

Manufacturing, traditionally a late adopter of technology, recognized the need to utilize data to improve operational efficiencies. Investments in IoT and automation have gained traction, enabling manufacturers to enhance productivity and respond to unforeseen disruptions like global crises. The IT spending in Manufacturing is projected to grow at a CAGR of 8.8% between 2023 and 2027, reaching USD 1081 billion by 2027.

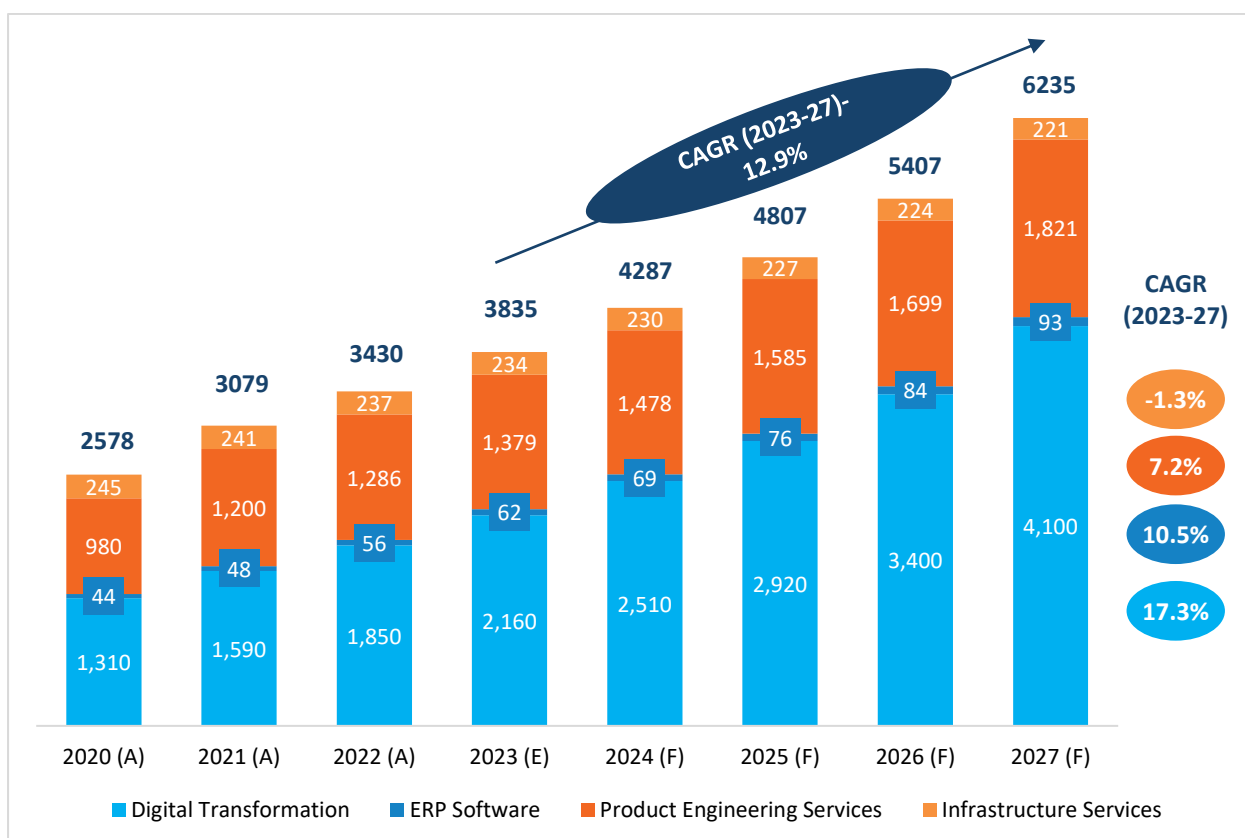
Healthcare and Life Sciences have seen unprecedented growth in technology spending due to the demands of managing critical healthcare infrastructure and providing quality care.

Healthcare IT spending is expected to grow at a CAGR of 16.3% between 2023 and 2027, reaching USD 360 billion by 2027. Similarly, Life Sciences continues to invest in cutting-edge technology, driving innovation in research and healthcare delivery.

1.1.4 Global Technology Service Spend Across Key Functions

The global enterprise function landscape is undergoing a paradigm shift, with organizations ramping up investments in various sectors to stay ahead in today's fast-paced, technology-driven environment. Digital transformation, enterprise resource planning (ERP) software, product engineering services, and infrastructure services are some of the key areas that are experiencing significant shifts in global spend.

Exhibit 5: Global Spend on Enterprise Functions, CY 2020-27, USD Billion



Source: Frost& Sullivan, Secondary Sources

The Technology Services landscape is evolving at unprecedented rate as engagement models undergo changes and enterprises double down on their digital transformation initiatives. The global spend on digital transformation is projected to witness a significant surge, rising from USD 1310 billion in 2020 to USD 4100 billion by 2027, growing at a CAGR of 17.3% (2023-27). Enterprise digital transformation is a multi-decade, multi-billion dollar opportunity. Changing business and market requirements such as omnichannel customer experience, ability to scale data requirements, better and faster business insights are driving digital transformation spend. United States will continue to be the largest market accounting for nearly 35% of the worldwide total.

We now anticipate a powerful wave of change based upon various combinations of smart products, machine learning, industry-specific business platforms and entirely new forms of

business value. This growth stems from the increasing need for businesses to adapt to rapidly evolving technological advancements and to maintain a competitive edge in the market. The mega technology upcycle has just gotten underway.

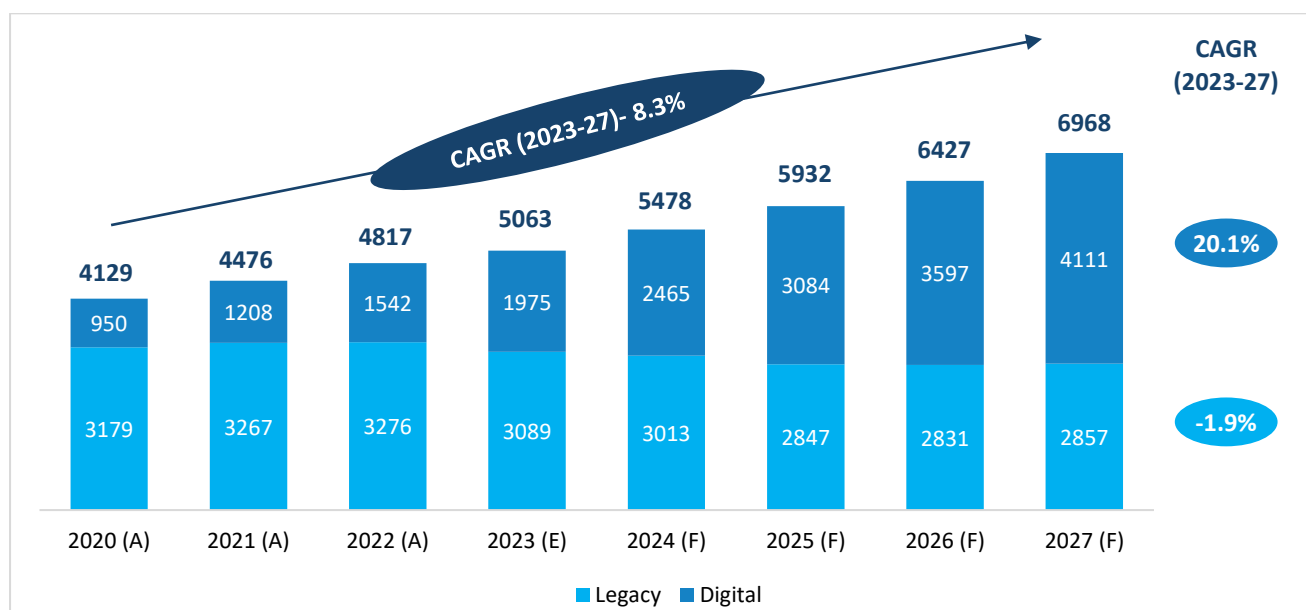
In terms of enterprise resource planning (ERP) software, the spend is expected to more than double, increasing from USD 43.5 billion in 2020 to USD 92.8 billion in 2027, growing at a CAGR of 10.5% (2023-27). This can be attributed to businesses aiming to improve efficiency and productivity by integrating various functions such as finance, human resources, and supply chain management and the ongoing ERP refresh cycle.

Product engineering services are also set to experience substantial growth, with the global spend expected to nearly double from USD 980 billion in 2020 to USD 1821.2 billion in 2027, growing at a CAGR of 7.2% (2023-2027). The driving force behind this growth is the need for companies to innovate and develop new products to meet the ever-changing demands of consumers. According to estimates, the average company now uses over 250 different cloud-based applications with large enterprises using over 320 cloud based applications.

Lastly, the global spend on infrastructure services is expected to decrease slightly from USD 244.5 billion in 2020 to USD 221.2 billion by 2027. This decrease can be attributed to organizations shifting towards cloud-based solutions, which are typically more cost-effective than traditional infrastructure services.

1.1.5 Global IT spend with split and growth by digital vs traditional

Exhibit 6: IT Spending by Digital Vs. Legacy (CY 2020-27)



Source: Frost& Sullivan, Secondary Sources

By 2027, the enterprise digital spending is expected to exceed USD 4 trillion. Largely this is caused by the continuous evolution and rapid innovation in digital technologies, which have opened up new vistas for businesses. Cloud computing, artificial intelligence, and the Internet of Things (IoT) offer unprecedented opportunities to streamline operations, enhance customer engagement,

and gain a competitive edge. Consequently, companies are increasingly recognizing the imperative of embracing digital transformation to stay relevant and competitive in the market.

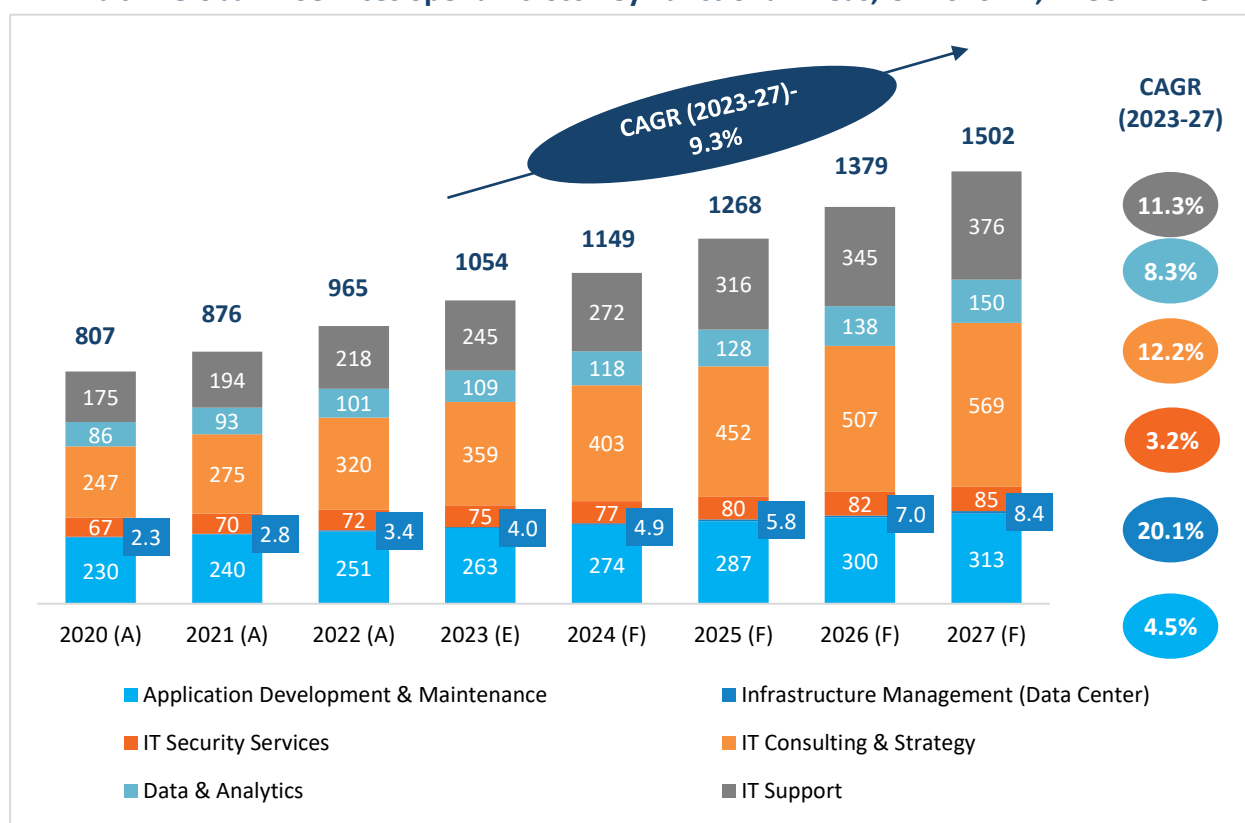
The modern business landscape demands agility and responsiveness. To keep pace with ever-shifting customer preferences and market trends, organizations are turning to digital solutions. These technologies enable rapid adaptation and empower companies to swiftly implement changes and seize emerging opportunities.

Automation, data-driven insights, and improved resource allocation inherent to digital solutions help companies optimize their operations and reduce operational costs. In an era where efficiency and cost-effectiveness are paramount, this becomes a compelling reason to allocate resources to digital initiatives.

1.1.6 Global IT Services Spend Across Key Functional Areas

The global IT services landscape is witnessing an upward trajectory, with businesses across various industries increasingly recognizing the importance of digital transformation

Exhibit 7: Global IT Services Spend Across Key Functional Areas, CY 2020-27, in USD Billion



Source: Frost & Sullivan, Secondary Sources

In Application Development & Maintenance, spending is expected to increase from USD 230.1 billion in 2020 to USD 313.1 billion in 2027. This substantial growth reflects the rising demand for custom applications that cater to specific business needs, along with a growing need for maintaining these applications in the fast-evolving digital landscape. The segment is expected to grow at a CAGR of 4.5% (2023-2027).

Infrastructure Management, particularly Data Center services, is projected to grow from a relatively modest USD 2.3 billion in 2020 to USD 8.4 billion in 2027. This sharp incline is indicative

of the growing reliance on data centers as businesses move towards cloud computing and virtualization to manage the ever-increasing data loads. The segment is expected to grow at a CAGR of 20.1% (2023-2027).

The spending on IT Security Services is anticipated to increase from USD 67 billion in 2020 to USD 85 billion in 2027. This growth is driven by the increasing complexity and volume of cyber threats, compelling businesses to invest in robust security measures to protect their digital assets. The segment is expected to grow at a CAGR of 3.2% (2023-2027).

IT Consulting & Strategy is another segment that is expected to witness significant growth, with expenditures rising from USD 246.6 billion in 2020 to USD 569.0 billion in 2027. This growth underscores the critical role of IT consulting services in helping businesses align their technology strategy with their business objectives. The segment is expected to grow at a CAGR of 12.2% (2023-2027).

The Data & Analytics segment is projected to see an increase from USD 85.5 billion in 2020 to USD 149.7 billion in 2027. This trend is indicative of the growing importance of data-driven insights in decision-making processes across businesses of all sizes. The segment is expected to grow at a CAGR of 8.3% (2023-2027).

Lastly, IT Support spend is expected to rise from USD 175.0 billion in 2020 to USD 376.3 billion in 2027. This growth can be attributed to the growing complexity of IT environments, necessitating specialized support services to ensure smooth operations. The segment is expected to grow at a CAGR of 11.3% (2023-2027).

1.2 Market Drivers and Opportunities for Key Functional Areas

1. Application Development & Maintenance:

Market Drivers:

- **Digital Transformation:** The rapid evolution of digital technology has significantly impacted businesses across various sectors, necessitating the development and maintenance of customized applications tailored to specific business needs and workflows. The aim is to enhance operational efficiency and customer experience.
- **Mobile Technology:** The proliferation of smartphones and mobile applications has driven businesses to develop and maintain mobile applications to reach and engage their audience effectively.

Opportunities:

- **AI Integration:** Integrating Artificial Intelligence (AI) into applications can significantly enhance the user experience by providing personalized content and automating routine tasks, thereby offering businesses a competitive edge in the market.
- **Cross-Platform Development Tools:** By providing tools for cross-platform development, businesses can be catered to their need to target a larger audience through applications compatible with various operating systems.

2. Infrastructure Operations and Management (Data Center):

Market Drivers:

- **Data Growth:** The exponential growth of data due to the increasing reliance on digital platforms has led businesses to seek data center services to manage and store their data efficiently and securely.
- **Cloud Computing:** The shift towards cloud computing necessitates data centers that can store and manage the vast amounts of data on the cloud, thereby facilitating businesses in their digital transformation journey.

Opportunities:

- **Sustainable Data Centers:** There is an opportunity for service providers to develop sustainable data centers that utilize renewable energy sources, and has energy efficient design and infrastructure thereby addressing the environmental concerns associated with data center operations. IT service providers can further utilize energy efficient equipment (servers, storage systems etc.) to minimize energy consumption and can also enter into long-term agreements to purchase renewable energy directly from sustainable sources to ensure a sustainable power supply for data centers.
- **Edge Computing:** Investing in edge computing can cater to businesses seeking to process data closer to where it is generated, thereby reducing latency and enhancing overall performance.

3. IT Security Services:

Market Drivers:

- **Cyber Threats:** The increasing prevalence of cyber threats, ranging from malware attacks to data breaches, has emphasized the importance of IT security as a top priority for businesses aiming to protect their digital assets.
- **Data Privacy Regulations:** The stringent data privacy regulations and compliance requirements necessitate businesses to invest in IT security services to ensure the protection of customer data and avoid legal penalties.

Opportunities:

- **AI-Powered Security Solutions:** Integrating AI into security solutions can significantly enhance the capabilities of threat detection and response, thereby providing businesses with a robust security infrastructure.
- **Security as a Service:** Offering Security as a Service can cater to the needs of small and medium-sized businesses seeking cost-effective and scalable security solutions.

4. IT Consulting & Strategy:

Market Drivers:

- **Complex IT Environments:** The complexity of IT environments, coupled with the rapid pace of technological change, has led businesses to seek consulting services to align their technology strategy with business objectives and navigate the digital landscape successfully.

- **Regulatory Compliance:** The need to comply with various industry-specific and general regulations has increased the demand for IT consulting services, as businesses aim to adhere to legal requirements while leveraging technology.

Opportunities:

- **SME Market:** Small and medium-sized enterprises (SMEs) represent a significant market opportunity, as they often lack the internal resources to navigate the complex digital landscape and therefore seek external consulting services.
- **Industry-Specific Solutions:** Providing industry-specific solutions and consulting services can cater to the unique needs of businesses in different sectors, thereby enhancing the value proposition.

5. Data & Analytics:

Market Drivers:

- **Data-Driven Decision Making:** The growing importance of data-driven insights in shaping business strategies and decision-making processes has increased the demand for data & analytics services, as businesses seek to leverage data to gain a competitive advantage.
- **Big Data:** The advent of big data technology has further fuelled the growth of the data & analytics sector, as businesses aim to harness the potential of large datasets to derive meaningful insights.

Opportunities:

- **Augmented Analytics :** Integrating AI and machine learning into data & analytics services can provide businesses with advanced analytics capabilities, thereby enabling them to derive more profound and actionable insights from their data.
- **Real-Time Analytics:** Offering real-time analytics solutions can cater to the needs of businesses seeking to make timely and informed decisions based on up-to-the-minute data.

6. IT Support:

Market Drivers:

- **Complex IT Environments:** The increasing complexity of IT environments necessitates specialized support services to ensure that systems and networks are running smoothly and efficiently, thereby facilitating business operations.
- **Remote Work:** The shift towards remote work, exacerbated by the COVID-19 pandemic, has increased the demand for IT support services to cater to the needs of remote employees and ensure that they have access to the necessary resources and support.

Opportunities:

- **AI-Powered Support:** Incorporating AI into IT support can significantly enhance the efficiency and effectiveness of support services by automating routine tasks and providing personalized support to end-users.

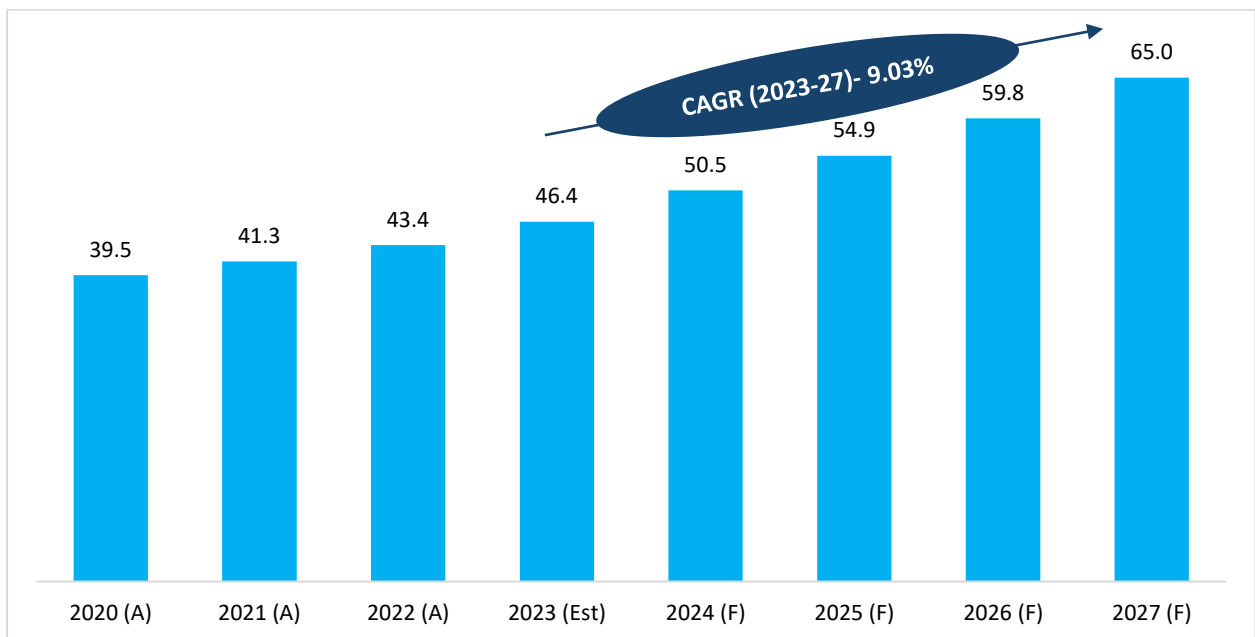
- **Self-Service Solutions:** Providing self-service solutions, such as chatbots and knowledge bases, can cater to businesses seeking to empower their employees and reduce the burden on support teams, thereby reducing support costs.

2 Global ERP Market Overview

2.1 Overview of Global ERP Market

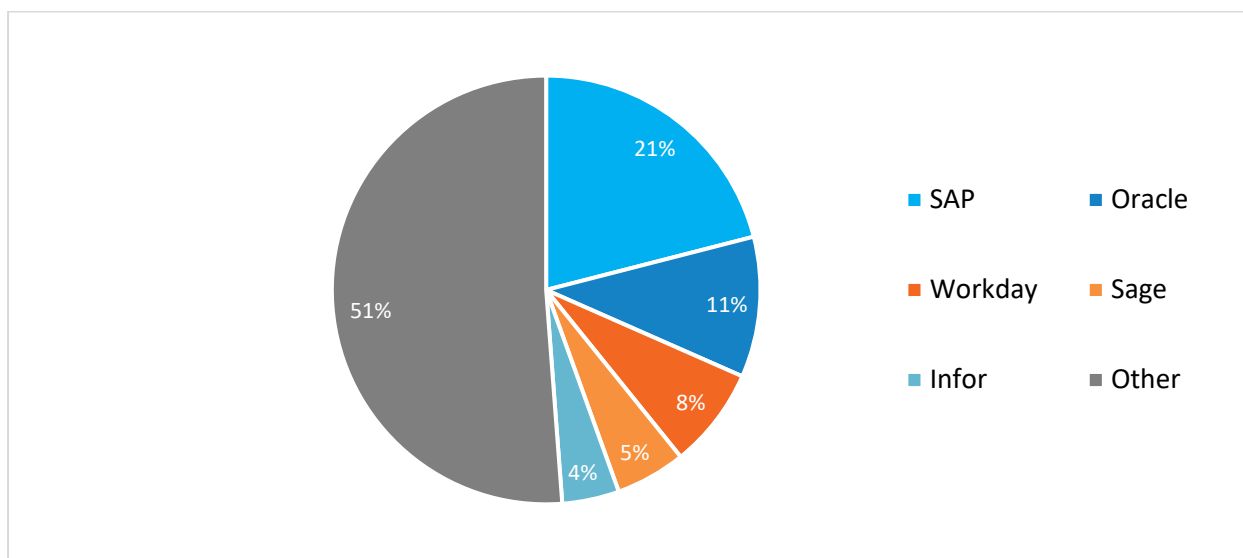
The global Enterprise Resource Planning (ERP) market has evolved significantly over the past few years, growing at a CAGR of 9.03% (2023-27), with businesses across various sectors recognizing the need for a streamlined and integrated approach to manage their operations. ERP systems are comprehensive software solutions that bring together multiple business processes and enable the flow of data between them. By providing a centralized repository of data, ERP systems help organizations optimize their business processes, facilitate informed decision-making, and improve overall organizational performance. Some of the key factors that have led to the growth of the global ERP market include:

Exhibit 8: Global ERP Software Market Size, CY 2020-27, in USD Billion



Source: Frost& Sullivan, Secondary Sources

Exhibit 9: Global ERP Software Market Share of Top 5 Vendors, CY 2020, in USD Billion



Source: Frost& Sullivan, Secondary Sources

Demand for Operational Efficiency: One of the most significant drivers for the growth of the ERP market is the increasing demand for operational efficiency and transparency in business processes. Organizations seek to leverage ERP systems to gain a comprehensive view of their operations, identify inefficiencies, and implement improvements. This need for operational excellence is particularly relevant in today's fast-paced business environment, where organizations must adapt to changing market conditions and customer demands quickly.

Rise of Cloud-based ERP Solutions: Cloud-based ERP solutions have been a significant catalyst for the market's growth, offering a more cost-effective and scalable alternative to traditional on-premise systems. With cloud ERP, businesses, especially small and medium-sized enterprises (SMEs), can access advanced functionalities without the need for substantial capital investment. The flexibility and ease of access provided by cloud-based solutions have made ERP systems more accessible to businesses of all sizes.

Business Analytics: The integration of data analytics and business intelligence into ERP systems has further propelled the market's growth. These integrated solutions enable organizations to process vast amounts of data, derive actionable insights, and make informed business decisions. As a result, modern ERP systems have evolved from merely being a tool for streamlining business processes to a strategic asset that can drive business growth.

Mobile ERP Applications: Moreover, the advent of mobile ERP applications has provided organizations with the ability to access their ERP systems on-the-go, facilitating better communication and collaboration among employees and improving overall organizational agility. This shift towards mobile ERP reflects the broader trend of mobilizing enterprise applications to support the increasingly mobile workforce.

The global ERP software market is dominated by key players such as SAP SE, Oracle Corporation, IBM Corporation, Infor, Microsoft Corporation, JD Edwards (Oracle), NetSuite Inc., Sage Group Plc., SYSPRO, TOTVS S.A., and Unit4.

SAP and Oracle are two of the biggest players in the market for enterprise resource planning (ERP) software. ERP software is critical for companies as it helps them manage their finances and operations. SAP has been the market leader in this area for many years.

2.1.1 Types of ERP Solutions

The types of ERP systems include on-premise, cloud-based, hybrid, and multi-cloud ERP systems:

On-Premise ERP System: A company's on-premise enterprise resource planning (ERP) system is licensed, customized, upgraded, backed up for data recovery, and overseen by its in-house IT staff. This is carried out on servers and computer equipment owned by the company and located at its physical office premises. The software is maintained internally on office computers and servers, providing full ownership and control to the business.

Cloud ERP System: A cloud-based enterprise resource planning (ERP) system operates over the Internet, allowing access from any location with an Internet connection at any time. This type of ERP software, often termed Software as a Service (SaaS), follows a subscription-based billing model. Cloud-based or web-based ERP systems can be accessed remotely on any device connected to the Internet. Referred to as Software as a Service (SaaS), this subscription-based service includes provisions for training, support, and customization, all managed by the service provider.

Hybrid ERP Systems: A hybrid ERP system employs a combination of on-premise infrastructure (including any connected EDGE devices for the Internet of Things) and cloud systems. This software amalgamates the functionalities of both types of services. The extent of flexibility and the incorporation of new additions into existing systems depend on how the user organization and service provider respectively host and deploy them. This type of ERP system offers enhanced flexibility and facilitates the seamless integration of new components into existing systems.

Multi-cloud ERP System: A multi-cloud ERP system utilizes integration to merge various third-party cloud applications and services, incorporating one or more public clouds with the ERP system. In a multi-cloud ERP deployment, the ERP system itself might be cloud-based.

2.1.2 Sectors that adopted ERP Solutions

- In these sectors, ERP has empowered businesses to reduce expenses, enhance internal process efficiency, and improve outcomes in customer service.**ERP for Manufacturing:** ERP software is increasingly essential for the manufacturing sector to efficiently manage intricate production processes. Cloud-based ERP facilitates tracking of raw materials, inventory management, and production scheduling. It also aids in quality control monitoring and tracking finished products. Seamless communication between finance, purchasing, production, and operations departments is facilitated, ensuring real-time coordination between sales and warehouse teams for accurate inventory management. ERP for manufacturing accelerates processes, adds value to each department, and enables efficient purchasing and innovation management.
- **ERP for Retail:** ERP systems are crucial in the retail industry for inventory management, order tracking, and payment processing. These systems provide insights into customer buying habits and preferences. Real-time visibility into warehouse levels ensures accurate

stock management, while ERP features oversee sales, payments, inventory management, tracking, and marketing.

- **ERP for Automotive Industry:** The automotive industry, with its intricate supply and manufacturing processes, benefits from ERP software. ERP aids in integrating supply chain activities, monitoring projects, executing designs, and achieving cost savings with improved accuracy. Given the complexity of the production line and the global reach of the automotive industry, ERP systems play a vital role in centralizing information and streamlining operations.
- **ERP for Food and Beverage:** Food and beverage manufacturers rely on ERP systems to ensure the creation of high-quality, uniform products meeting industry standards. ERP supports various processes in this sector, including alcoholic beverage production, meat and seafood processing, fresh produce handling, and confectionery production.
- **ERP for Healthcare:** ERP systems are increasingly utilized in the healthcare industry to manage patient records, schedule appointments, and track medical supplies. These systems enhance coordination between different departments and facilities, contributing to better healthcare service delivery.

2.2 Intelligent ERP or iERP:

Intelligent ERP (iERP), a cornerstone of digital transformation, represents a significant leap from traditional ERP systems, integrating advanced technologies to enhance business processes. It's defined by its use of machine learning and advanced analytics, built on extensive data sets, to effectively manage and automate business operations. This evolution reflects the shift from older, rigid ERP systems to more agile, intelligent platforms capable of driving modern digital businesses.

At the core of iERP are technologies like cloud computing, mobile technologies, big data, and the Internet of Things (IoT), which collectively enable businesses to transform their models and innovate. Cloud computing, for instance, offers versatile hosting services, crucial for businesses to access computing resources efficiently.

Mobile technologies extend this accessibility, allowing data access and transactions from virtually anywhere, significantly enhancing operational flexibility.

Big data integration in iERP systems handles vast structured and unstructured data for improved decision-making, with analytics providing meaningful interpretations and IoT enhancing efficiency through interconnected physical objects. Machine learning optimizes business processes, while smart factories and digital twins automate operations and optimize product performance. Blockchain technology in iERP ensures secure transactions, adding efficiency and security. This technological convergence transforms business operations and ERP solutions, driving innovation in the market. iERP offers benefits like resource optimization, real-time analysis for decision-making, improved user experience, and reduced operating costs, with its full potential and impact continuously evolving as businesses and vendors adapt to these intelligent solutions.

iERPs pose entry barriers due to the demand for specialized skills, a considerable learning curve and the need for combined industry, business domain and technology expertise. iERP services facilitate the establishment of enduring relationships with customers and offer a deep understanding of their business landscape.

2.3 Introduction to SAP and Enterprise Adoption

SAP SE, a German multinational software corporation, is one of the world's leading producers of software for the management of business processes. The company develops solutions that facilitate effective data processing and information flow across organizations. SAP is widely known for its ERP (Enterprise Resource Planning) software, which helps businesses manage their operations and customer relations seamlessly.

SAP's ERP System and Enterprise Adoption

SAP's ERP system is one of the most popular and widely used ERP solutions globally. Large corporations and enterprises commonly adopt it to integrate their various business processes into one unified system. This adoption has allowed organizations to streamline their operations, leading to increased efficiency, improved data accuracy, and better decision-making capabilities.

SAP caters to the unique needs and requirements of each enterprise. Therefore, their ERP system is designed to be flexible and customizable, allowing businesses to tailor the software according to their specific needs. This adaptability is one of the primary reasons why SAP is the preferred choice for many large corporations and enterprises.

One of the significant benefits of SAP's ERP system is its ability to provide real-time data analysis, offering valuable insights that can help organizations make informed decisions. This feature is crucial for enterprises as it enables them to respond quickly to market changes and take proactive measures to stay ahead of the competition.

In addition to its flexibility and real-time data analysis capabilities, SAP ERP facilitates seamless integration with other business applications, further enhancing its utility for enterprises. This integration is essential for organizations that rely on multiple software applications to manage their business processes, as it helps to eliminate data silos and ensures that all business functions are aligned and work in harmony.

Some of the top ERP systems used around the globe include:

NetSuite: Oracle's NetSuite stands as a renowned cloud-based ERP software, trusted by a global clientele of over 30,000 companies. This platform streamlines business operations by automating critical processes and providing real-time insights into both financial and operational performance. NetSuite offers seamless integrations with a wide range of FP&A and budgeting software, allowing users to directly pull NetSuite data into working spreadsheets for efficient financial decision-making. Due to its size and popularity, NetSuite integrates effortlessly with hundreds of other software applications.

Sage Intacct: Sage Intacct stands out as a cutting-edge accounting solution, providing real-time, multi-dimensional reporting and streamlining accounting tasks to elevate operational efficiency and productivity. Beyond its core accounting features, Sage Intacct extends its functionality to

encompass HR and payroll functions, offering a comprehensive solution for organizations seeking a unified platform. It encompasses its cloud-based nature, ensuring accessibility from any location, robust multi-entity management capabilities, a wide array of automation features that enhance operational efficiency, and a modular customization approach that allows organizations to create bespoke solutions tailored to their specific requirements.

Microsoft Dynamics 365: Microsoft Dynamics 365 stands as a cloud-based ERP system designed to empower businesses across finances, operations, sales, and customer relationships. Renowned for its user-friendly interface, Dynamics 365 offers a high degree of customization, adapting seamlessly to diverse business needs. D365 include an extensive range of pre-built and native integrations, a user-friendly drag-and-drop interface for easy customization, support for multiple currencies and languages, and robust security measures adhering to compliance standards.

Oracle ERP Cloud: Oracle ERP Cloud stands out as a formidable ERP system, covering a spectrum of functionalities including financial management, human resources management, manufacturing planning, and supply chain management. This comprehensive solution streamlines daily tasks, ensuring efficiency and scalability, with the added support of Oracle's renowned customer support team. Its scalability makes it particularly suitable for large enterprises, and advanced analytics coupled with robust reporting capabilities contribute to enhanced business insights.

2.4 Impact of Digital Transformation on Global ERP Market

The impact of digital transformation on the global ERP (Enterprise Resource Planning) market is significant and has led to a shift in market dynamics among the leading players like SAP, Oracle, Microsoft, Salesforce, and ServiceNow. Some of the key impacts of digital transformation on ERP market are listed below.

1. Digital Transformation and Cloud Integration:

Cloud Adoption:

The migration towards cloud platforms has emerged as a pivotal driver of digital transformation in the ERP market.

Cloud solutions amalgamate business data and transactions into a singular system, fostering remote working, amplifying business productivity, and curtailing IT and investment costs.

Cloud Transition by Legacy Vendors:

Esteemed ERP vendors like SAP, Oracle, and Microsoft are nudging their clientele from on-premise systems towards cloud solutions. This transition is generating a surge in demand, propelling many organizations into the digital transformation journey, readiness notwithstanding. Companies with strong focus on ERP business are poised to benefit from the ERP Migration and ERP Refresh Cycles.

2. Innovative Approaches:

AI and Machine Learning:

Companies like Salesforce, ServiceNow, and Workday are ushering in digital transformation 2.0 by introducing AI and machine learning to their clientele, with aims to create substantial economic value in the forthcoming decades.

Consumerization of Employee Service Experience:

These firms are also accentuating the enhancement of the employee service experience by automating tasks and simplifying convoluted processes, akin to the simplicity offered by consumer sites to their users.

3. Strategic Partnerships and Integrations:

Microsoft's Cloud Partnerships:

Microsoft has forged cloud partnerships with Oracle, SAP, and ServiceNow, underscoring a collaborative demeanour in the cloud domain.

ServiceNow and Oracle Integration:

ServiceNow now backs Oracle Cloud Infrastructure, indicating a strategic amalgamation aimed at refining digital workflows.

ServiceNow and Microsoft Alliance:

An augmented partnership between ServiceNow and Microsoft aspires to expedite digital transformation for enterprise and government patrons.

4. Individual Company Strategies:

Salesforce:

With a focus on cloud-based platforms for digital transformation, Salesforce is extending its CRM prowess into the ERP market, offering tools to manage customers efficaciously and pinpoint high-priority customer segments and prospects.

ServiceNow:

Initially honed on IT service management, ServiceNow has broadened its platform to automate tasks across functions, serving as a pivotal conduit of digital transformation in several firms.

2.5 SAP S/4HANA Adoption – From Transition to Transformation

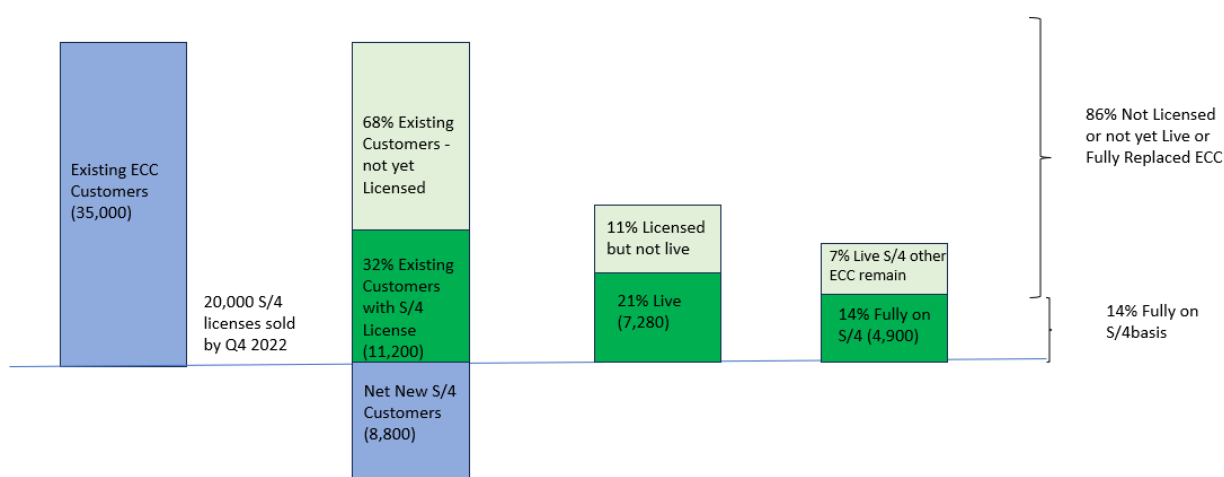
Organizations adopting SAP S/4HANA are making a strategic shift towards advanced digital architectures, moving away from traditional systems encompassing both previous SAP ERP solutions and non-SAP ERP platforms. This transformation paves the way for smarter business decisions through the integration of intelligence into business processes. The adoption of SAP S/4HANA goes beyond a mere technical upgrade; it embodies a holistic digital transformation strategy. This transition marks a decisive step towards achieving a more agile, transparent, and data-centric business framework, aligning seamlessly with the evolving needs of today's digital economy.

SAP has announced the maintenance support timeline for SAP ERP 6.0 and its enhancement packages 6, 7, and 8. Mainstream maintenance support is available until 2027, with an optional extended maintenance phase until 2030. Beyond 2027, SAP customers can choose the Extended Maintenance Option, incurring a premium of two percentage points on existing maintenance costs, covering all support offerings from 2028 to the end of 2030.

The second alternative is the Customer-Specific Maintenance Option. Customers who choose not to opt for Extended Maintenance but continue to use SAP Business Suite 7 software will be automatically transferred to customer-specific maintenance. This transition is expected to generate a "project wave" of implementations and upgrades.

SAPS/4HANA sales have been growing significantly, and a considerable portion of Business Suite 7/ECC customers are yet to migrate to it. These developments are expected to trigger a wave of migrations from Business Suite 7 to S/4 HANA in the coming years, which will have a significant impact on the SAP System Integrator community.

State of S/4 Migration (at Q1 2023)



Source: Frost & Sullivan; Secondary Sources

By the end of 2022, SAP reported ~20,000 customers had licensed S/4HANA, the 20,000 customers are one's that currently have a licence for S/4HANA and of those, Gartner's latest estimate is that 56% are net new customers.

The number of customers who have FULLY migrated to S/4HANA from ECC at around 4,750, or around 14% of the original 35,000 with another 7% being in-flight. This has increased by about 3% from last year.

By the end of 2027, only 31% of existing ECC customers will be fully live. By the end of 2030, that would only rise to 43%.

Below are several key points and steps involved in this transition to transformation based on the latest data and expert insights:

SAP Activate Methodology:

The SAP Activate Methodology is a structured framework guiding businesses through the transition to SAP S/4HANA. It offers a collection of business and technical services supporting customers from the beginning to the end of their transformation journey.

This methodology encompasses strategic planning, application scoping, and transition planning. Strategic planning lays the foundation by translating business strategy into a technical roadmap.

Adoption Approaches:

There are various adoption approaches like System Conversion (Brownfield) New Implementation (Greenfield) and Selective Data Transition available for transitioning to SAP S/4HANA. These approaches offer different pathways for migrating data and processes from the old system to the new one based on the specific needs and circumstances of a business.

Data Migration and Management:

Data migration is a pivotal aspect, and tools like the SAP S/4HANA Migration Cockpit are devised to facilitate a smooth data transition. The Migration Cockpit enables different migration approaches and features to support a seamless transition.

Deployment Options:

S/4HANA's flexible architecture supports both cloud and on-premises deployments, making it a scalable choice for businesses of all sizes. Businesses need to evaluate SAP S/4HANA deployment options and licensing comprehensively. Finding a suitable partner for any SAP S/4HANA deployment project is crucial for success.

Digital Transformation Impact:

The migration to SAP S/4HANA is often perceived as a critical step in a company's digital transformation journey, offering real-time data and insights, improved productivity, and streamlined processes.

Challenges and Adoption Rate:

Despite the advantages, only 14% of current and intended SAP ERP users have completed the transition to S/4HANA, highlighting the challenges and the necessity for better IT alignment in the migration process.

The migration to SAP S/4HANA signifies a strategic move towards digital transformation, requiring meticulous planning, selection of the right migration approach, and effective data management.

Company Profiling:

#	Company	Market Cap (USD Billion)	Cloud Revenue (USD Million)	Cloud Rev. as a % of Total Rev	Cloud Revenue Growth CY20-22	# of Customers	ERP business trends
1	SAP	195.1	11.2	38%	24%	425,000+	S4/HANA transition

2	Oracle	320.9	35.3	71%	11%	430,000+	Gen AI into Fusion Cloud
3	Microsoft	2,887	87.9	41%	21%	NA	AI-driven ERP systems
4	ServiceNow	141.6	6.9	95%	27%	7700+	ERP Modernization for finance and supply chain
5	Salesforce	252.9	29	100%	21%	150,000+	Revenue Intelligence in ERP

Note:

- 1 Euro = 1.09 USD
- For Oracle, data is as of the latest SEC filings dated July 10, 2023. For the fiscal year ended May 31, 2022.
- For Salesforce, data is as of the fiscal year ended Jan 31, 2023.
- For others, data is as of the fiscal year ended Dec 31, 2022.
- Market cap is as of December 1, 2023, Microsoft market cap is as of Jan 2024

2.6 Drivers and Constraints for SAP Implementation

Market Drivers

- 1. End of Support for SAP ECC 6 and Business Suite 7:** With the end of support for SAP ECC (Enterprise Core Components), organizations are prompted to migrate to SAP S/4HANA to ensure ongoing support, security, and access to the latest features and innovations.
- 2. Shift towards SAP S/4HANA:** Transitioning to SAP S/4HANA is part of many organizations' digital transformation strategies. S/4HANA is designed to operate on a cloud infrastructure, enabling companies to modernize their systems and processes. One key driver for the existing SAP customers is the streamlining of operations from the earlier ECC architecture to S/4HANA, aiming for more efficient business processes. S/4HANA's ability to integrate with other systems and platforms both within and outside the SAP ecosystem can also be a driver for its implementation.
- 3. Cost Optimization:** ERP leaders are under pressure to save costs and timelines for implementation projects as businesses strive to optimize commercial advantages. Client satisfaction depends on high-quality implementation, which is only possible when cost, time, and scope goals are met. SAP ERP systems integrate businesses by automating and streamlining corporate procedures, which is essential for lowering errors and boosting productivity, both of which have a good effect on consulting services.

Market Constraints:

- 1. Shortage of ERP Resources:** There's a significant demand for third-party ERP implementation services, which has highlighted a shortage of available resources, making it a top concern on the vendor scorecard for customers. The shortage has been acknowledged in regions such as the UK and Ireland, particularly with a noted lack of skills and the

retirement of experienced SAP managers in user organizations. The Americas' SAP Users' Group also released research showing that about a quarter of organizations see skills as a major challenge in working with SAP technology, with some projects being held up due to this skills shortage. The shortage of ERP resources worldwide presents a significant opportunity for IT service companies in India. As organizations seek cost-effective, scalable, and reliable ERP solutions, outsourcing to Indian IT service providers has emerged as a compelling option. With a vast talent pool and a proven track record, Indian IT service companies such as MOURI Tech are well-positioned to meet the growing demand for ERP support, contributing to the success of businesses globally.

- 2. Learning Curve for ERPs:** Implementing SAP, being an advanced ERP system, involves a substantial learning curve, especially for business users unfamiliar with its functionalities. The methodology for implementing SAP S/4HANA Cloud, known as SAP Activate, provides assets dedicated to aiding solution adoption, organizational change management, and end-user learning, which underlines the learning curve and the need for adequate training and support.
- 3. Opportunities in the Oracle Space:** The competition between SAP and Oracle in the ERP market could be a factor swaying some organizations towards Oracle. This competition is exemplified in their strategies concerning cloud-based solutions, where both giants are investing heavily. The implementation time and cost for SAP S/4HANA, or Oracle Cloud ERP are driven by various factors, such as the magnitude of business process change, impact on people, technology, functional expansion, geographic considerations, and internal team experience. These factors, especially when it comes to technology and functional expansion, could sway an organization towards Oracle if they find Oracle's offerings more suited to their needs or more cost-effective.

The evolving landscape in IT implementation is set to be advantageous for industry participants like MOURI Tech. MOURI Tech, boasting certified and seasoned ERP professionals, is well-positioned to assist enterprise clients in addressing the resource scarcity issue. Considering that mastering ERPs typically entails a learning curve spanning 1-2 years, entities like MOURI Tech, with their established team of skilled ERP practitioners, are expected to experience robust demand from enterprises.

2.7 Drivers and Constraints for Service Now (SNOW) Implementation

Drivers:

1. Offers improved service delivery, automation, and end-to-end management.
2. Enhances visibility, scalability, and compliance while strengthening cybersecurity to ensure a secure and compliant service ecosystem.
3. Bolster digital transformation, reallocating resources towards innovation.
4. Known for its adaptability, enabling continuous workflow improvements during implementation.

5. Offers comprehensive service system extending beyond ITSM, encompassing HR Service Delivery, Customer Service, Risk Management, Security Operations, and emerging industry-specific solutions such as Financial Services Operations and Telecom Service Management
6. The consolidation of vendors and the demand for a standardized platform.
7. The emergence of GenAI provides a favorable growth catalyst.
8. Investment in industry verticalization, broadening the product development roadmap across diverse sectors.

Constraints:

1. Organizations need to navigate implementation costs, platform complexity, change management challenges, and integration intricacies.
2. Vendor dependency and ongoing maintenance also require consideration.
3. Resistance to change, resource limitations in terms of budget and skilled personnel, complexities associated with ITSM frameworks like ITIL, integration.
4. Challenges with legacy systems, difficulties in measuring ROI, and the risk of overemphasizing documentation or vendor lock-in.

2.8 Drivers and Constraints for Oracle Cloud ERP Implementation

Drivers:

1. Offers full-scale business solution suite covering a wide range of business processes across regions and industries.
2. Due to the highly integrated business solution model, all or any stand alone and individually mounted multiple tools and solutions can be brought onto a single platform.
3. Highly evolved standard security features with feasibility to connect to any possible external security tools to protect data.
4. Advanced analytics features for in-depth and real-time reporting purposes.
5. Efficient and seamless deployment of services through Oracle Cloud Infrastructure (OCI) AI Services with its pre-built machine learning models.
6. Investment in human capital and product offerings enriches workforce capabilities and diversifies the product portfolio.
7. The launch of Oracle Banking Cloud Services offers scalable, cloud-based solutions for banks, facilitating rapid and cost-effective modernization.
8. Cross-selling and upselling initiatives maximize revenue by providing existing clients with additional products and services.

Constraints:

1. User acceptability and adaptability to newly implemented Oracle Fusion Cloud ERP for their business processes.
2. intensive training requirement in case of migrations from legacy system

2.9 Drivers and Constraints for Microsoft Dynamics 365 (D365) Implementation

Drivers:

1. Microsoft D365 offers solutions for key enterprise functions in two broad segments. Customer Engagement (CE) includes functions like Sales, Marketing, Customer Service, and Field Service, while ERP covers Finance, Supply Chain, Human Resources, Project Operations. Dynamics 365 also includes other modules like Commerce.
2. Dynamics 365 product suite supports both enterprise and SMB customers. Robust enterprise-scale ERP solutions can be implemented using Field & Operations (F&O) while SMB clients' ERP requirements can be implemented using Business Central and Great Plains.
3. By leveraging Power Platform suite of products like Power Apps, Power Automate, Power BI, Virtual Agents, and Power Pages, along with Dynamics 365, customers can integrate, extend and enable services to both internal and external stakeholders in a secure manner and without compromising data.
4. D365 enables organizations foster resilience and collaboration to innovate and implement efficient business processes.
5. D365 enhances business agility, automates tasks, and facilitates hyperconnected relations. It enables customers build future-ready business models by utilizing the power of AI to enhance productivity, speed up decision making and build agility to stay ahead of the competition.
6. D365 Migration Program aids in transitioning workloads from on-premise to cloud.
7. D365 provides industry-specific solutions for both Service-centric and Product-centric businesses.
8. Microsoft offers MS Sustainability Manager (MSM), a robust sustainability platform, that enables enterprises accelerate both purpose and profit with ERP-enabled (Environmental, Social and Governance) ESG strategies.
9. Microsoft provides a comprehensive learning platform and certification program for partners to adopt, implement and master Dynamics 365 and Power Platform technologies.
10. Microsoft AppSource and Azure Platform enables ISVs and Service Providers to innovate and publish accelerators and point solutions that further enhance the capabilities of Dynamics 365, both from technology and industry perspectives.
11. Per Microsoft, with the consolidation of all CE and ERP products under Dynamics 365, there is 40% more probability that a customer choosing CE would also implement ERP and vice versa. In the last year, CE adoption has grown 29% while F&O has grown 23%. 42% of Dynamics 365 deals also included Power Platform, while 50% of CIOs responded that Power Platform is the platform of choice for automation and low-code/ no-code initiatives.

Constraints:

1. While D365 products have gained market share across all business sectors (SMB, Enterprise, Public Sector) and geos, certain perceptions need to be overcome. These perceptions include challenges in migrating from non-Microsoft platforms to D365, portal UI and look and feel, limited/ no support in certain business processes like CPQ, Payroll, etc.
2. Customers should conduct a detailed gap-fit analysis with their organization requirements and be aware of the risks and trade-offs that need to be made by choosing D365.
3. Customers should conduct a detailed study of specific aspects like data storage, premium features, licenses, etc., while easily pushing up the costs, to determine the Total Cost of Ownership (TCO).

2.10 Drivers and Constraints for Salesforce Implementation

Drivers:

1. Customer Service Focus: The shift towards customer service accentuates the need for migrating to cloud-based CRM solutions like Salesforce for enriched customer relations.
2. Scalability, Flexibility, and Cost-Effectiveness: Salesforce facilitates business scaling, industry adaptation, and cost-effective operations, boosting efficiency and productivity.
3. Integration Capabilities: Salesforce's integration with other business systems augments data visibility, streamlines workflows, and synchronizes information across departments.
4. The emphasis on integrating core clouds and platforms creates opportunities for enhanced collaboration and seamless functionality, potentially attracting a broader user base.
5. The introduction of the Data Cloud, coupled with real-time hyperscale data and AI advancements, opens avenues for automating processes, enhancing intelligence, and delivering real-time capabilities across the Customer 360, presenting opportunities for improved customer experiences and business growth.

Constraints:

1. Customization: Extensive customization in Salesforce can lead to longer implementation timelines and complications during system upgrades.
2. Balancing Customization and Maintenance: Striking a balance between customization and maintenance is challenging but essential for long-term system compatibility.
3. Data Security and Privacy Concerns: Cloud storage of sensitive data necessitates robust security measures to comply with data privacy regulations like GDPR and CCPA.

2.11 Benefits of SAP Implementation and Enterprise ERP Ecosystem

The integration of SAP, especially its S/4HANA suite, alongside general Enterprise Resource Planning (ERP) systems has proven to be significantly advantageous for numerous global organizations. The following are some of the diverse benefits accrued from these technological evolutions, reflecting on the current trends:

SAP Implementation

Enhanced Performance and Efficiency:

A key benefit of deploying SAP S/4HANA is the boost in performance and efficiency it imparts to business operations. SAP S/4HANA, as a contemporary ERP suite, offers a myriad of features aimed at elevating both performance and efficiency, facilitating businesses to flourish in a digital economy.

Cost Efficiency and Innovation:

The adoption of SAP S/4HANA is recognized for its cost efficiency due to lower total implementation expenses. Moreover, the shift to SAP S/4HANA creates avenues for co-innovation with clientele without necessitating product upgrades, thus simplifying adoption.

Smooth Transition and Diminished Disruption:

The migration strategy coupled with Selective Data Transition, smoothens the transition to SAP S/4HANA, diminishing business disruption and expediting implementation with superior data quality and performance.

Revenue Augmentation:

A notable merit is the significant revenue augmentation businesses observe post-SAP integration. As per an IDC study, enterprises that adopted SAP solutions observed considerable revenue enhancement, corroborating the financial merits of SAP adoption.

Enterprise ERP Ecosystem

Cloud-oriented Systems:

The enterprise ERP realm has witnessed a surge in cloud-oriented ERP systems, which afford scalability, adaptability, and cost efficiency. These systems enable businesses to access their data ubiquitously, with automatic software refreshes, thereby obviating manual update necessities.

Integration and Automation:

ERP systems foster the amalgamation of disparate business modules into a singular cohesive platform, thereby augmenting productivity, enriching analytics, and improving visibility across business processes. Furthermore, the automation capability of ERP systems in routine tasks and manual process elimination contributes to enhanced efficiency and productivity.

Data Security and Informed Decision-making:

In a business landscape where data is invaluable, ERP systems are pivotal in guaranteeing data security. By centralizing data, they facilitate superior decision-making by delivering crucial insights and discerning patterns and trends in data.

Technological Evolution and Customization:

The enterprise ERP domain is incessantly evolving with technological innovations like AI, Machine Learning, and IoT integration, revolutionizing business operations. The heightened emphasis on customization enables businesses to mould their ERP systems to cater to their distinct needs, hence amplifying user satisfaction and operational efficacy.

3 Global Digital Transformation

3.1 Defining Digital Transformation for The Evolving Enterprise Requirements

As enterprises navigate through shifting market landscapes and respond to evolving consumer demands, understanding the essence of digital transformation within this context becomes crucial. At its essence, digital transformation involves strategically integrating digital technologies to elevate business operations, spur innovation, and enhance experiences for both customers and employees. It's a comprehensive transformation, not only in terms of technology adoption, but in redefining how enterprises function, communicate, and deliver value.

The evolution of modern enterprises is a testament to the transformative power of digital transformation. The transition from traditional, hierarchical structures to agile, customer-centric organizations underscores the impact of digital transformation. Modern enterprises prioritize flexibility, data utilization, remote work support, and robust cybersecurity, reflecting their responsiveness to evolving customer expectations and market dynamics. Technology, from cloud computing to AI, IoT, and 5G connectivity, plays a pivotal role in driving these changes, enabling modern enterprises to navigate a dynamic, data-centric, and agile business landscape successfully.

For the evolving enterprise, digital transformation can unlock unparalleled growth opportunities across the following:

Business Model Innovation

Digital transformation challenges traditional business models. It encourages modern enterprises to rethink how they create, deliver, and capture value. Through innovative digital strategies, companies can diversify revenue streams, expand their market reach, and explore new lines of business. This innovative shift is particularly evident in industries where digital disruption has become the norm, such as e-commerce, streaming services, and fintech. By embracing digital transformation, enterprises position themselves to be agile and adaptable, ready to pivot when market conditions demand it.

Competitive Differentiation

In an era defined by relentless competition, digital transformation provides a means for modern enterprises to stand out. By leveraging technology and data-driven insights, companies can differentiate themselves through superior customer experiences, product innovation, and efficient operations. The ability to swiftly adapt to changing market dynamics and customer needs gives modern enterprises a competitive edge. This differentiation translates into higher customer retention, market share growth, and enhanced brand reputation.

Micro-Innovation Approach

Micro-Innovation entails continuous, minor enhancements using digital technologies. These nuanced, progressive enhancements, as opposed to large-scale disruptions can significantly enhance efficiency, customer experience, and overall value over time. A collaborative effort involving numerous micro-innovations to support and enhance innovation within an organization will foster an agile ecosystem that rapidly adapts to technological advancements and market shifts.

- **Product / Platform Engineering Mindset:** In digital transformation, the product/platform engineering mindset centers on a user-centric approach, applying product management principles to treat the platform as a product. It emphasizes user needs, incorporates AI and automation, and necessitates user research, feedback loops, and internal marketing. Treating developers as customers, the mindset focuses on reducing friction, enhancing value, and evolving continuously for improved user experience, emphasizing the importance of internal customer interactions.

Scalability and Flexibility

Digital transformation empowers modern enterprises with scalability and flexibility that were previously challenging to achieve. Cloud computing and virtualization technologies allow businesses to scale their operations up or down based on demand. This flexibility minimizes the need for large, upfront investments in physical infrastructure and enables a "pay-as-you-go" model. It also provides the freedom to explore new markets and experiment with different business strategies without the limitations of traditional brick-and-mortar constraints.

Global Reach and Market Expansion

The digital transformation journey extends beyond local markets and opens doors to global opportunities. By leveraging e-commerce platforms, online marketplaces, and digital advertising, modern enterprises can access a global customer base. This expansion comes with its unique challenges, such as international regulations and logistics, but it also unlocks immense growth potential. The modern enterprise is no longer confined to regional limitations but can explore new territories and markets with a global perspective.

Enhanced Decision-Making

Data analytics and artificial intelligence play pivotal roles in enhancing decision-making within the evolving enterprise. Through digital transformation, businesses can access vast amounts of data, analyse it in real-time, and derive actionable insights. This data-driven decision-making

enables companies to make informed choices, respond swiftly to market changes, and innovate more effectively. It is no longer a matter of intuition but rather a science driven by data and analytics.

3.2 Global Digital Transformation Landscape – Overview

In a world where digital technology permeates every facet of our lives, it's no surprise that businesses and organizations are racing to keep up with the ever-evolving landscape of digital transformation. Digital transformation is not just a trend; it's a paradigm shift that has fundamentally altered the way we conduct business, manage resources, interact with customers, and innovate in the current technology landscape.

In the relentless march of progress, digital transformation stands out as one of the defining forces reshaping the technology and business landscape. As the digital era is unfolding, this profound shift is promising to change the way we are working, interacting, and doing business in fundamental ways.

The Changing Technology Landscape

Digital transformation also profoundly affects the technology landscape, ushering in new possibilities and trends such as:

Emergence of AI and Machine Learning: Artificial intelligence (AI) and machine learning have become central to digital transformation. These technologies power automation, predictive analytics, and personalization, enhancing both internal processes and customer-facing interactions.

Advanced Analytics: Advanced analytics is revolutionizing the technology landscape, enabling organizations to derive deeper insights from vast amounts of data. By employing techniques like machine learning, predictive modeling, and statistical analysis, businesses are transforming decision-making processes, leading to more informed, data-driven strategies. This shift is integral to the global digital transformation, as it allows companies to harness the full potential of their data assets, improving efficiency and innovation.

Internet of Things (IoT): The proliferation of IoT devices is creating vast streams of data that can be harnessed for insights and automation. IoT is connecting everything, from smart homes and factories to healthcare devices, reshaping various industries.

Cloud Computing: Cloud services provide scalable, cost-effective solutions for businesses. The flexibility and accessibility of cloud computing are integral to digital transformation, enabling remote work, data storage, and collaboration.

Cybersecurity: As digital reliance grows, so does the need for robust cybersecurity. Protecting sensitive data and ensuring secure digital operations are paramount. Cybersecurity is an integral part of digital transformation initiatives.

Industry Matter Expertise & Business Transformation: The convergence of industry matter expertise and business transformation is pivotal in today's technology landscape. This integration

facilitates the creation of tailored solutions that address specific industry challenges, leading to more effective digital transformation strategies.

Business Process Services: Business Process Services (BPS) are at the forefront of reshaping the technological landscape. By integrating advanced technologies like AI and machine learning into traditional business processes, BPS providers are enabling organizations to streamline operations, reduce costs, and enhance customer experiences. This evolution is essential for businesses seeking to adapt and thrive in the digitally transformed world, where operational agility and efficiency are key to success.

Robotic Process Automation (RPA): RPA is a transformative force in the realm of digital technology. By automating repetitive, rule-based tasks, RPA tools are freeing up human resources for more strategic, creative work. This shift is not only improving operational efficiencies but also driving innovation, as employees are able to focus on higher-value activities. RPA's role in digital transformation is crucial, as it represents a significant step towards more intelligent, automated business processes.

Hyperautomation: Hyperautomation orchestrates a diverse array of technologies and tools, including AI, ML, event-driven architecture, RPA, Intelligent Business Process Management Suites (iBPMS), Integration platform as a Service (iPaaS), and low-code / no-code tools. This great leap forward propels businesses towards greater efficiency and agility. Hyperautomation is a key factor in the digital transformation as it eliminates human involvement in low-value processes.

DevOps: DevOps is reshaping the technology landscape by bridging the gap between software development and IT operations. This practice emphasizes collaboration, continuous integration, and rapid deployment, leading to faster and more efficient software development cycles. In the context of global digital transformation, DevOps is critical, as it enables organizations to quickly adapt to changing market demands, roll out new features seamlessly, and maintain a competitive edge in a rapidly evolving digital world.

Design Thinking: Digital transformation enhances the capabilities of design thinking by providing new tools, data, and methodologies. It empowers designers to create more user-centric, innovative, and responsive solutions in an environment where technology and human-centered design are increasingly interconnected. Technology's impact on Design Thinking includes advanced digital tools, VR and AR technologies, AI-driven insights, collaboration platforms, user-centered design software, 3D printing, big data analytics, and IoT technologies. These advancements revolutionize the Design Thinking process, reinforcing its central role in the future of design and innovation.

Customer Experience: In the changing technological landscape, customer experience is being significantly impacted by digital transformation. Organizations across industries are leveraging advanced technologies, such as AI, IoT, and cloud computing, to enhance customer experience and drive business success. Digital transformation is shifting organizations towards a customer-centric approach, enhancing personalization and convenience. Leveraging data-driven insights improves customer experience, fostering loyalty, satisfaction, and business performance.

3.3 Need for Digital Transformation in Today's Scenario

The business landscape of today is undergoing an unprecedented transformation, driven by the convergence of rapidly advancing technologies, changing customer expectations, and recent global events. In this context, the need for digital transformation has become more than a strategic choice—it has evolved into a survival imperative for organizations in every sector. Customers, both individuals and enterprises, expect seamless and personalized experiences, which necessitate a fundamental shift in how organizations operate and deliver value. Additionally, the COVID-19 pandemic highlighted the critical importance of resilience, agility, and the ability to function in remote and distributed environments.

These factors underscore the first crucial need for digital transformation: Adaptation to the digital age. Organizations must embrace digital technologies to stay competitive, agile, and responsive to a rapidly evolving marketplace. In today's scenario, the failure to adapt means risking obsolescence. As businesses that are slow to change struggle to meet customer expectations, disruptive newcomers emerge with innovative digital solutions that challenge established players.

The second essential need for digital transformation lies in data utilization and insights. Data is the new currency, and organizations must harness its potential for informed decision-making, personalization, and competitive advantage. Data-driven strategies enable organizations to understand customer behaviour, anticipate market trends, and respond proactively. Digital transformation empowers businesses to not only collect and store vast amounts of data but also extract valuable insights through advanced analytics.

Digital transformation also addresses the need for enhanced operational efficiency. By automating processes, optimizing workflows, and reducing manual tasks, organizations can significantly improve productivity and reduce operational costs. Moreover, flexible work environments are imperative in today's scenario. The traditional office-centric model has given way to remote and distributed workforces. Digital transformation equips businesses with the tools and infrastructure to enable effective remote work, supporting flexibility and continuity in a post-COVID-19 world.

Cybersecurity and compliance represent another critical need. The increasing reliance on digital technologies has expanded the attack surface for cyber threats. Protecting sensitive data and ensuring compliance with evolving regulations are non-negotiable. Businesses must invest in robust security measures to safeguard their operations and build trust with customers.

3.4 Drivers and Constraints for Digital Transformation Adoption

Market Drivers:

Many businesses are prioritizing digital transformation, but it's crucial to understand the variables that are necessitating this shift. The following are some of the key drivers which propel the adoption of digital transformation.

Optimizing Revenue Generation

Digital transformation enables businesses to explore untapped markets and revenue streams. By leveraging online platforms, digital marketing, and e-commerce, organizations can expand their reach beyond traditional boundaries. Digital transformation allows businesses to collect, analyse, and act on data insights in real time. This data-driven decision-making not only enhances competitiveness but also helps in anticipating market trends and customer preferences, and thereby contributing to effective revenue generation. **Digitally Evolving Consumers**

Customers' demands are always changing. The emphasis on speed is the most apparent advancement as technology advances. Customers anticipate having their wants answered instantly as communication becomes more rapid and simple. It is in a company's best interests to implement the technology required for quick connection with customers because the customer experience is a crucial component of corporate success.

Market Competitiveness

In a fiercely competitive landscape, businesses strive to differentiate themselves through digital innovation. Adopting digital transformation helps them stay ahead by offering new products, services, or business models. This innovation not only attracts customers but also fosters a culture of continuous improvement within the organization.

Business Resilience

Recent global events, such as the COVID-19 pandemic, have highlighted the importance of business resilience. Digital transformation enables remote work, disaster recovery, and business continuity planning, ensuring that operations can continue in challenging circumstances. It provides the flexibility needed to weather unforeseen disruptions.

Employee Productivity and Engagement

Modern employees expect digital tools that facilitate remote work, collaboration, and seamless communication. Digital transformation enhances productivity and engagement by providing the tools and flexibility needed for the workforce. Engaged employees are more motivated and contribute to the organization's success.

Market Constraints:

Cost and Resource Constraints

Small and mid-sized businesses may struggle to allocate the necessary funds and the required human resource for a comprehensive transformation. The adoption of the technology might be diminished for SMEs, as their operations often involve smaller scales and less intricate processes. The perceived lower complexity may lead to a cautious approach to adoption, as the costs may not align with the scale of their business operations.

Lack of Digital Skills

The shortage of digital skills in the workforce is a significant restraint. Organizations may struggle to find and retain talent with the necessary expertise in areas like data analytics, AI, and cybersecurity. Training and upskilling programs are essential to bridge this skills gap.

Change Resistance

Employees may resist digital transformation due to fear of job displacement, unfamiliar technology, or concerns about job security. Change management becomes crucial in overcoming this restraint. Effective communication, training, and involvement in the transformation process can also mitigate resistance.

Unclear ROI

Some organizations struggle to define and measure the return on investment (ROI) for digital transformation initiatives. The lack of clear metrics and a tangible business case can deter adoption. Developing a robust ROI framework and continuously evaluating progress can help address this restraint.

Complexity and Integration Challenges

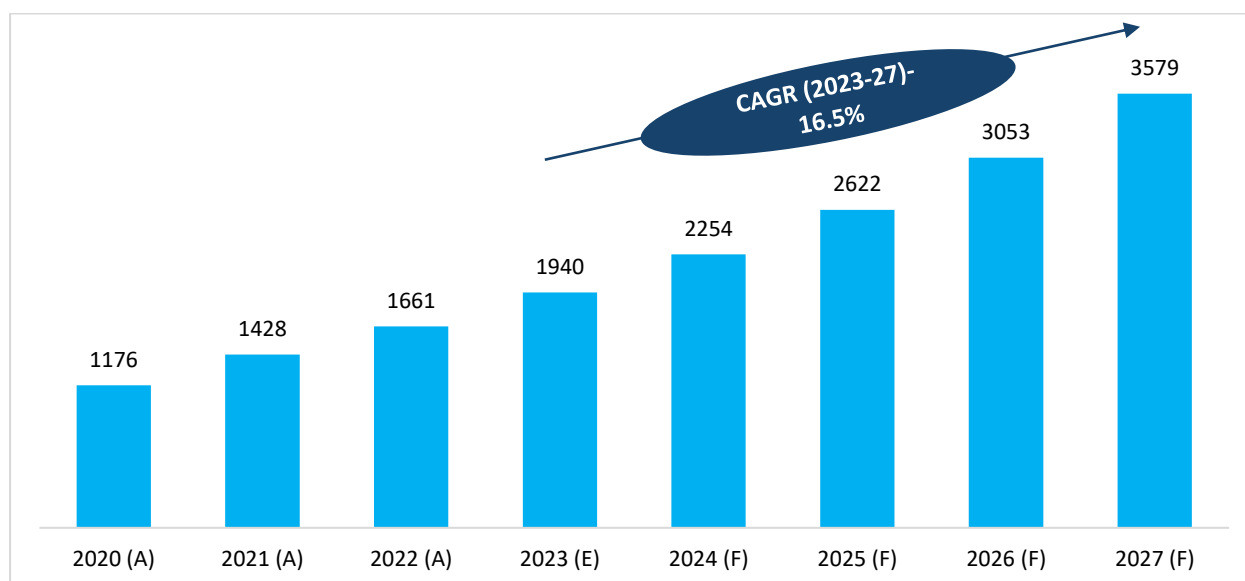
Digital transformation often involves complex integration of various technologies and platforms. Overcoming integration challenges, ensuring data consistency, and upholding system reliability can present formidable challenges. . A well-defined integration strategy and ongoing monitoring are crucial to address this restraint.

3.5 Global Spending on Digital Transformation

The market for digital transformation has experienced exponential growth, driven by a convergence of factors. Increasing competitive pressures have compelled organizations to invest in digital technologies to gain a competitive edge. Simultaneously, changing customer expectations have placed a premium on personalized, data-driven experiences, necessitating digital transformation initiatives.

Moreover, the COVID-19 pandemic served as a catalyst, accelerating the adoption of digital technologies to enable remote work, enhance supply chain resilience, and facilitate online customer interactions. As a result, digital transformation is expected to grow at a CAGR of 16.5% (2023-27), underscoring its indispensable role in the modern business landscape. This growth trend is expected to continue as businesses recognize that digital transformation is not merely an option but an imperative for future success. Digital transformation serves as a catalyst for modernizing businesses, leading to enhanced efficiencies, heightened profitability, and an improved customer experience. Digital transformation contributes to boosting Return on Equity (ROE) through strategic levers such as sustainable cost reduction and a focus on customer-centric approaches. While the effects on profitability may require time for integration and validation, a thorough analysis underscores its potential to enhance enterprise performance in the long run. The United States will account for 35.8% of worldwide DX spending in 2023

Exhibit 10: Spend on Digital Transformation Globally, CY 2020-27, USD Billion



Source: Frost& Sullivan, Secondary Sources

4 Global Advanced Analytics Market

4.1 Overview:

Advanced analytics is not a recent phenomenon but has evolved significantly in response to the escalating complexity of modern data. Traditionally, organizations relied on basic reporting and descriptive analytics to understand past performance. However, the advent of big data, machine learning, and artificial intelligence (AI) has ushered in a new era of advanced analytics, capable of predictive and prescriptive insights.

Predictive analytics leverages historical data and machine learning algorithms to forecast future trends and behaviours. It empowers businesses to anticipate customer needs, optimize inventory, and make data-driven decisions. Meanwhile, prescriptive analytics goes a step further, recommending actions to achieve desired outcomes. These advanced techniques, together with descriptive analytics, form a comprehensive toolkit for organizations to extract value from their data.

Impact of Advanced Analytics:

In an era where competitive advantage hinges on innovation and agility, advanced analytics has become a critical tool for organizations. It empowers them to unlock insights hidden within their data, fostering innovation in product development, customer service, and operational excellence. Companies that harness advanced analytics gain a competitive edge by making faster, more informed decisions.

Moreover, advanced analytics facilitates a data-driven culture within organizations. It encourages cross-functional collaboration, breaking down silos and enabling data-driven decision-making at all levels. By democratizing data insights, advanced analytics ensures that employees across departments have access to the information they need to excel in their roles.

Challenges and Ethical Considerations:

While the potential of advanced analytics is vast, it is not without its challenges. One primary concern is data privacy and security. The accumulation of personal data for analysis raises ethical questions about individual privacy and consent. Organizations must navigate these concerns through robust data governance and compliance measures.

Additionally, the adoption of advanced analytics requires substantial investments in technology, talent, and training. To address the skills gap, organizations should either enhance the skills of their existing workforce or recruit data scientists, analysts, and engineers proficient in effectively utilizing these technologies. Building such expertise in-house can be challenging, making outsourcing to specialized professionals who excel in data management and analytics a more feasible option.

4.2 Key Market Drivers and Constraints for Advanced Analytics

Market Drivers:

- 1. Increasing Data Generation:** The proliferation of data sources, including IoT devices, social media, and sensors, has led to an explosion in data volumes. Organizations are driven to harness this data for insights that can improve operations, targeted marketing, enhance customer experiences, and drive innovation. The need to process and analyse this data is a significant driver for the advanced analytics market.
- 2. Demand for Data-Driven Decision-Making:** As competition intensifies and markets evolve rapidly, organizations recognize the imperative of data-driven decision-making. Advanced analytics empowers businesses to move beyond intuition and gut feeling, enabling them to make evidence-based decisions that increase competitiveness and adaptability.
- 3. Rise of Augmented analytics:** The integration of AI and ML into advanced analytics solutions has transformed the capabilities of analytics. These technologies enable automated, predictive, and prescriptive analytics, allowing organizations to extract deeper insights from data and automate decision-making processes.
- 4. Industry-Specific Applications:** Advanced analytics solutions are increasingly customized to meet industry-specific needs. For example, in healthcare, predictive analytics aids in early disease detection, while in finance, it enhances fraud detection. These tailored applications make advanced analytics indispensable in addressing specific challenges within various sectors.
- 5. Cross-Industry Integration:** Advanced analytics is not limited to a single industry; it offers cross-industry applicability. As organizations recognize the potential for knowledge sharing and cross-pollination of analytics techniques, they are more inclined to invest in advanced analytics solutions. These versatile tools are valuable in addressing diverse challenges and fostering innovation across sectors.

Market Constraints:

- 1. Data Fragmentation and Silos:** Many organizations struggle with fragmented data sources and data silos. This fragmentation hampers the effectiveness of advanced analytics by limiting access to comprehensive data sets. Consolidating and integrating data from various sources can be a time-consuming and resource-intensive process, acting as a restraint to implementation.
- 2. Limited Industry Expertise:** Some specialized industries require domain-specific knowledge to apply advanced analytics effectively. For instance, healthcare analytics demands a deep understanding of medical practices. A lack of industry expertise among data scientists and analysts can hinder the adoption of advanced analytics in such domains, making it imperative to bridge this knowledge gap.
- 3. Data Privacy and Security Concerns:** The collection and analysis of vast amounts of data raise significant concerns about data privacy and security. Organizations must navigate a complex landscape of data protection regulations and invest in robust cybersecurity measures to safeguard sensitive information, addressing these concerns is a top priority.
- 4. High Implementation Costs:** Implementing advanced analytics solutions can be capital-intensive. Costs include investments in technology infrastructure, software licenses, and hiring skilled personnel. For smaller organizations or startups, these upfront costs can be a significant barrier to entry.
- 5. Data Quality Issues:** Poor data quality can undermine the effectiveness of advanced analytics. Inaccurate or incomplete data can lead to incorrect insights and decisions. Organizations need to invest in data cleansing, quality assurance processes, and data governance to ensure reliable results.

Enterprises are acknowledging the need to adapt to a more dynamic and specialized business environment, prompting a reevaluation of their operational strategies. The realization that certain tasks and functions can be handled more effectively by external specialists has led to a paradigm shift. This shift is especially pronounced in areas where outsourcing provides a strategic advantage, allowing enterprises to focus on their core competencies while leveraging the expertise of external service providers. Recognizing these limitations, enterprises are increasingly turning to external specialists who possess the necessary skills and experience to navigate the intricacies of these domains.

4.3 Role of Industry-led Data Models in Advanced Analytics

Industry-led data models are standardized data schemas and structures developed collaboratively by experts within a particular industry. These models define how data should be organized, stored, and exchanged to meet industry-specific needs and regulatory requirements. They serve as a common language that enables seamless data sharing and analysis among organizations within a given domain. These models leverage industry-specific expertise to transform data into actionable insights. This means that instead of having a generalist perspective on data, there's a specialist, industry-centric approach. Such models consider the

unique challenges, intricacies, and opportunities within specific sectors, ensuring that the analytics derived are relevant, actionable, and capable of driving genuine value.

Implementing analytics in-house presents significant challenges for enterprises due to resource constraints, technical complexity, and the need for specialized expertise. Outsourcing on the other hand emerges as a strategic approach providing organizations with numerous advantages. Outsourcing analytics offers businesses access to professional expertise in areas like cloud computing, big data, and advanced analytics, overcoming talent shortages. It provides industry-specific knowledge for effective data management and compliance with evolving regulations. Outsourcing ensures scalability, faster results, and a focus on core activities, promoting long-term growth. Additionally, it proves cost-effective by avoiding expenses related to in-house teams and leveraging global partnerships for enhanced efficiency.

Benefits of Industry-led Data Models:

One of the key advantages of industry-led data models is their ability to address the unique challenges and nuances of a specific industry. For example, in healthcare, industry-led data models like HL7 (Health Level Seven) and FHIR (Fast Healthcare Interoperability Resources) provide a standardized way to exchange electronic health records, ensuring data consistency and interoperability among healthcare providers and systems. Similarly, in finance, models like FIX (Financial Information eXchange) facilitate the efficient exchange of trading and market data among financial institutions.

Some of the key benefits of industry-led data models are outlined below:

1. **Interoperability and Data Sharing:** Perhaps the most significant benefit of industry-led data models is their role in fostering interoperability and data sharing. By adhering to standardized data structures, organizations can exchange data seamlessly, enabling collaborative analytics initiatives. This interoperability is especially crucial in sectors like healthcare, where patient data must flow securely across various healthcare providers and systems.
2. **Accelerated Analytics Initiatives:** Industry-led data models expedite the deployment of advanced analytics initiatives. Data scientists and analysts can quickly access and understand the data structure, reducing the time required for data preparation. This acceleration is critical in industries with fast-changing market dynamics, such as retail and e-commerce.
3. **Optimizing Back-Office Operations:** Advanced analytics, powered by industry-specific data models, has the potential to revolutionize back-office operations. For instance, in the healthcare industry, such models can provide insights into patient care, streamline administrative processes, and optimize resource allocation. Similarly, in the retail sector, they can provide insights into consumer behaviour, inventory management, and supply chain optimization. These models thus play a critical role in identifying inefficiencies and proposing solutions tailored to industry needs.
4. **Optimized Decision Making:** Another key advantage of industry-led data models is their potential to bridge the gap between raw data and decision-making. Traditional models often left businesses with heaps of data but no clear path to interpret or act upon it. In contrast, industry-led models, with their inherent understanding of specific sectors, provide businesses

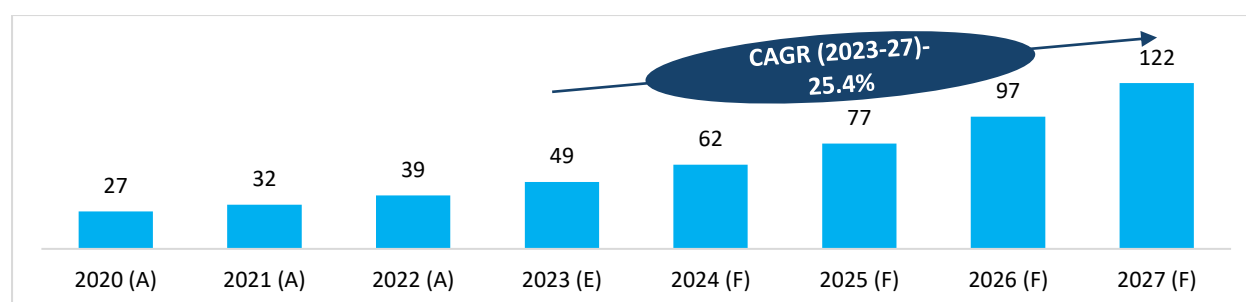
with context. This context is pivotal in turning data into information, information into insight, and insight into actionable strategy.

- 5. Potential to Generate New Revenue Streams:** When organizations have a deep understanding of their industry's intricacies, they're in a prime position to identify unmet needs, emerging trends, and potential innovations. Industry-led data models have the potential to create new revenue streams by offering more tailored, insightful, and actionable analytics that can be harnessed in innovative ways. By analysing data through the lens of an industry-specific model, businesses can identify underserved segments or entirely new markets where they can expand.

4.4 Market Size of Global Advanced Analytics

The global experience during the COVID-19 pandemic highlighted the indispensable role of advanced analytics in crisis response and resilience. As businesses look to scale for growth and navigate evolving challenges, advanced analytics emerges not just as a tool but as a strategic imperative for those seeking to thrive in a data-centric and dynamic world.

Exhibit 11: Global Advanced Analytics Market Size, CY 2020-27, in USD Billions



Source: Frost& Sullivan, Secondary Sources

The expected growth of the global advanced analytics market is underpinned by the increasing recognition of data's value, the pursuit of a competitive edge, and the widespread adoption of data-driven decision-making. Industry-specific solutions, the integration of AI and ML, and the need for resilience in the face of challenges further contribute to this growth trajectory. The market size for the global advanced analytics segment is expected to grow from 49.2 billion USD in 2023 to 121.6 billion USD by 2027 at a CAGR of 25.4% during the period (2023-27).

5 Operating Models in The Global IT Industry

5.1 Types of Operating Models in the Global IT Industry

The Information Technology (IT) industry, a cornerstone of the modern business world, has given rise to an array of operating models. These models, often grounded in sourcing and geographical strategies, play a pivotal role in how companies harness IT capabilities. As businesses seek to

leverage global talent, ensure cost-effectiveness, and maintain competitive advantages, understanding these models becomes paramount. Here's an expanded exploration:

Offshoring:

Offshoring, or relocating business processes to a distant country, has been a mainstay in the IT sector for decades. This model primarily capitalizes on the lower labour costs found in countries such as India, the Philippines, and parts of Eastern Europe. Beyond cost savings, offshoring offers access to vast talent pools and the ability to operate around the clock. However, challenges can arise from time-zone discrepancies, cultural differences, and concerns about the quality of delivered services.

Nearshoring:

As a middle ground between offshoring and onshoring, nearshoring involves outsourcing work to countries in closer geographical proximity. For example, U.S. businesses might nearshore to Mexico or Canada, while European enterprises could opt for Eastern European nations. The relative closeness offers benefits such as aligned working hours, easier on-site visits, and a better cultural understanding, making collaboration smoother. It combines some cost advantages of offshoring with the operational ease of onshoring.

Onshoring:

Choosing to keep IT tasks within national borders, onshoring prioritizes direct communication, alignment in work culture, and logistical simplicity over the cost benefits that come with offshoring. Onshoring ensures full adherence to national regulations, making it a preferred choice for sectors with stringent legal and compliance mandates. The model promotes job growth within the home country and often enjoys positive public perception.

Hybrid Model:

By blending various elements of the aforementioned models, the hybrid approach allows businesses to harness the best of all worlds. Routine, scalable IT tasks might be offshored to capitalize on cost savings, while critical, strategic functions could remain onshore for closer oversight. Nearshoring might come into play for tasks requiring frequent collaboration. This adaptive model provides flexibility, making it suitable for businesses with diverse IT needs.

Captive Centers:

Taking control a step further, some multinational corporations establish their own dedicated centers in offshore or nearshore locations. These captive centers offer the cost benefits associated with offshoring, while allowing companies to maintain stringent control over quality, operations, and intellectual property. Though initial setup costs can be high, in the long run, captive centers can provide significant value by ensuring alignment with the parent company's standards and practices.

Global Delivery Model:

This model, championed by leading IT service providers, integrates resources across multiple geographies — combining onshore, nearshore, and offshore locations. This strategic distribution

ensures continuous service delivery, capitalizing on the day-night cycle. By tapping into the unique advantages of each location, the global delivery model achieves a balance of cost efficiency, speed, and quality.

Crowdsourcing:

Emerging with the rise of the digital age, crowdsourcing transforms traditional IT problem-solving. Platforms like Topcoder or GitHub allow companies to present challenges to a global community of professionals. Solutions are developed either collaboratively or competitively, introducing a decentralized approach. This model taps into a diverse set of skills and ideas, often leading to innovative solutions.

5.2 Benefits of Operating Models

While individually tailored to specific needs, these operating models cumulatively offer a plethora of benefits. A detailed exploration into each of these advantages reveals not only their intrinsic value but also their transformative potential for businesses.

Cost Optimization:

In a world of tightening budgets, the ability to optimize costs without compromising on quality is invaluable. Offshoring and nearshoring models offer businesses the opportunity to tap into regions with lower operational costs, allowing them to get more done for less.

Use Case: Major tech players like Apple and IBM have significantly offshored many of their IT operations to countries such as India and China. By doing so, they've harnessed the power of cost-effective labour, resulting in considerable savings without sacrificing product or service quality.

Access to Global Talent Pools:

With technological advancements happening at breakneck speeds, having access to a diverse range of expertise is critical. Different geographies have their unique strengths, and global operating models provide companies with a passport to these expertise hubs.

Use Case: Silicon Valley giants like Facebook and Google are known to hire talent from across the globe, recognizing the innovation potential stemming from diverse skill sets. By maintaining a presence in multiple countries, they ensure a steady influx of fresh, globally sourced perspectives.

Enhanced Collaboration and Cultural Alignment:

Cultural alignment is often overlooked but can be pivotal in ensuring smooth operations. Proximity and shared cultural nuances can foster better understanding and collaboration, leading to more effective outcomes.

Use Case: SAP, a German multinational, often collaborates with other European IT firms for projects within Europe. The shared cultural and business ethos ensures seamless communication and mutual understanding.

Flexibility and Scalability:

The unpredictable nature of the tech world requires businesses to be agile. Hybrid models offer companies the flexibility to scale operations up or down based on demand, ensuring they're always poised to respond to market dynamics.

Use Case: Netflix, faced with surging demand during the pandemic, leveraged its global operating model to scale its services. With teams spread across different regions, they ensured continuous uptime and rapid content delivery to a burgeoning user base.

Maintaining Control and Quality:

While outsourcing offers many benefits, it can sometimes lead to concerns about control and quality. Captive centers mitigate these concerns by offering the cost benefits of offshoring while retaining complete oversight of operations.

Use Case: Shell, the energy giant, has established its own IT hubs in places like Bangalore, ensuring that while they leverage local talent, they also maintain their stringent global standards and practices.

Driving Innovation Through Diversity:

Diversity is a wellspring of innovation. By operating in various geographies and tapping into diverse talent pools, companies can ensure a constant flow of unique ideas and perspectives.

Use Case: Microsoft's Hackathon, one of the largest private hackathons globally, invites employees from all its global locations to contribute ideas and solutions. This diverse participation often leads to groundbreaking innovations.

Rapid Problem Solving and Deployment:

Time is often of the essence in the IT world. A well-distributed global team ensures that there's always someone working on a problem, no matter the hour, leading to faster resolutions and quicker deployments.

Use Case: Salesforce, with its global support model, relies on teams from across the globe. This ensures that no matter when an issue arises, there's always a team ready to tackle it, resulting in minimal downtime for customers.

5.3 Changing Role of Offshoring in the IT Industry

The last few decades have witnessed offshoring becoming a cornerstone of the IT industry's strategic planning. Initially adopted as a cost-saving manoeuvre, offshoring's role has morphed significantly, reflecting the broader shifts in the industry and global economic landscape.

The Early Days: Cost-Centric Approach

In the 1990s and early 2000s, offshoring in the IT sector was primarily driven by a desire to reduce operational expenses. Western companies turned their gaze to countries like India, China, and the Philippines, where they found a vast pool of skilled professionals willing to work at a fraction of the cost of their western counterparts. The simple formula was clear: lower costs led to higher

profits. Companies like IBM, Accenture, and Oracle established sizable offshore centers, capitalizing on this labor arbitrage opportunity.

Shift towards Quality and Expertise

As the years progressed, the narrative started to change. While cost savings remained a significant factor, companies began to recognize the quality of work and the depth of expertise that offshore centers brought to the table. Offshoring was no longer just about saving money but about accessing world-class talent. Countries like India became renowned not just for their IT labour arbitrage but for their centers of excellence in software development, data analytics, and IT consulting.

Integration and Collaboration

With the rise of digital communication tools and platforms, geographical distances began to matter less. Offshored teams became more integrated with their onshore counterparts, leading to a more collaborative working environment. It was not uncommon to find multinational IT projects where teams from three or four different countries worked in tandem, bringing together a mosaic of cultural perspectives, expertise, and innovative solutions.

Rising Concerns and Re-shoring Trends

However, offshoring wasn't without its challenges. Concerns related to data security, intellectual property protection, and cultural misalignment started gaining traction. Some companies, sensing these challenges, began 're-shoring' or bringing back certain operations to their home countries. This was particularly prevalent in sensitive domains where data protection was paramount.

The Future: A Hybrid Model

As we gaze into the future of offshoring in the IT industry, a hybrid model seems to be emerging. Companies are unlikely to abandon offshoring entirely, given its undeniable benefits. Instead, they're opting for a blended approach, where critical operations might be kept onshore or nearshore, while other functions continue to be offshored. Moreover, the rise of remote work, especially post the COVID-19 pandemic, has further blurred the lines between onshore and offshore. With companies becoming more comfortable with fully remote teams, the distinction between a developer working from another part of the country and one working from another part of the world diminishes.

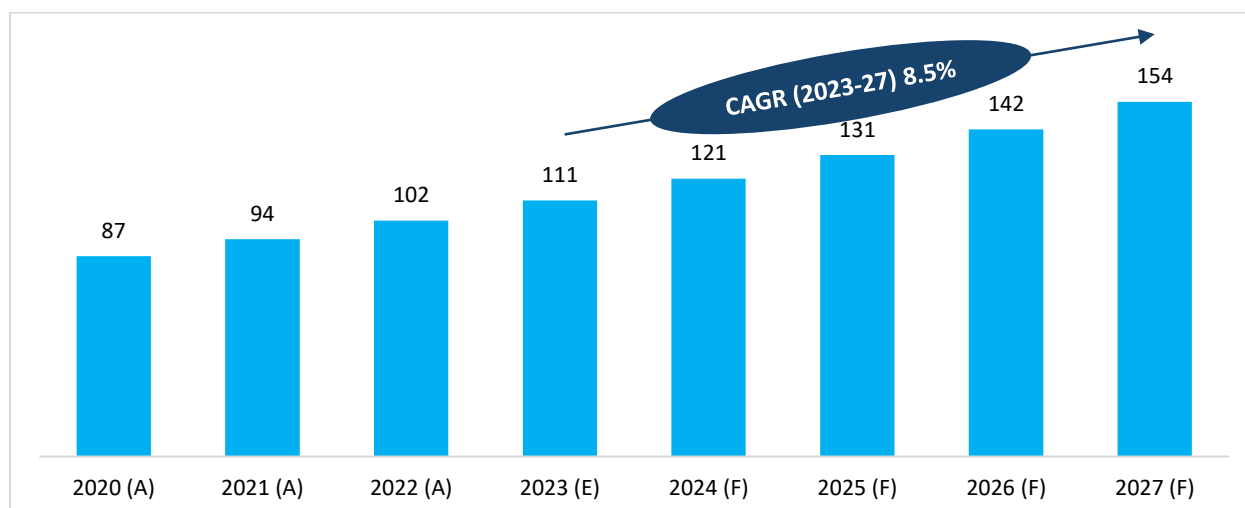
Non-captive IT offshoring expected to continue to play a crucial role in the global economy

Non-captive IT offshoring will continue to enable businesses optimize their operations, expand their market reach, and drive sustainable growth. This approach is particularly advantageous in situations where data sensitivity is low and enterprises are relatively smaller in size. The approach allows businesses to delegate crucial yet time-consuming tasks, such as database building, to external experts.

5.4 Addressable Market of Global Offshoring in the IT Industry

The growth of the offshore IT services reflects the enduring importance of the offshoring as a key enabler of business agility and growth in a digitally connected world. Businesses are turning to offshore IT services not just as a cost-saving measure but as a means to access a global pool of talent, expertise, and innovation, positioning the offshore IT services sector as a critical component of the evolving global IT ecosystem.

Exhibit 12: Global Offshoring IT Services Market Size, 2020-27, USD Billion



Source: Frost & Sullivan, Secondary Sources

The market is expected to grow at a CAGR of 8.5% (2023-27) and this growth can be attributed to several factors, including the increasing reliance on offshore IT services for digital transformation initiatives, software development, and IT support. Additionally, the pandemic accelerated the adoption of remote work, further driving the demand for offshore IT services. As organizations seek to stay competitive, innovate, and adapt to changing technology landscapes, offshore IT services are expected to play an increasingly vital role in their strategic initiatives.

5.5 M&A Trends in the IT Sector

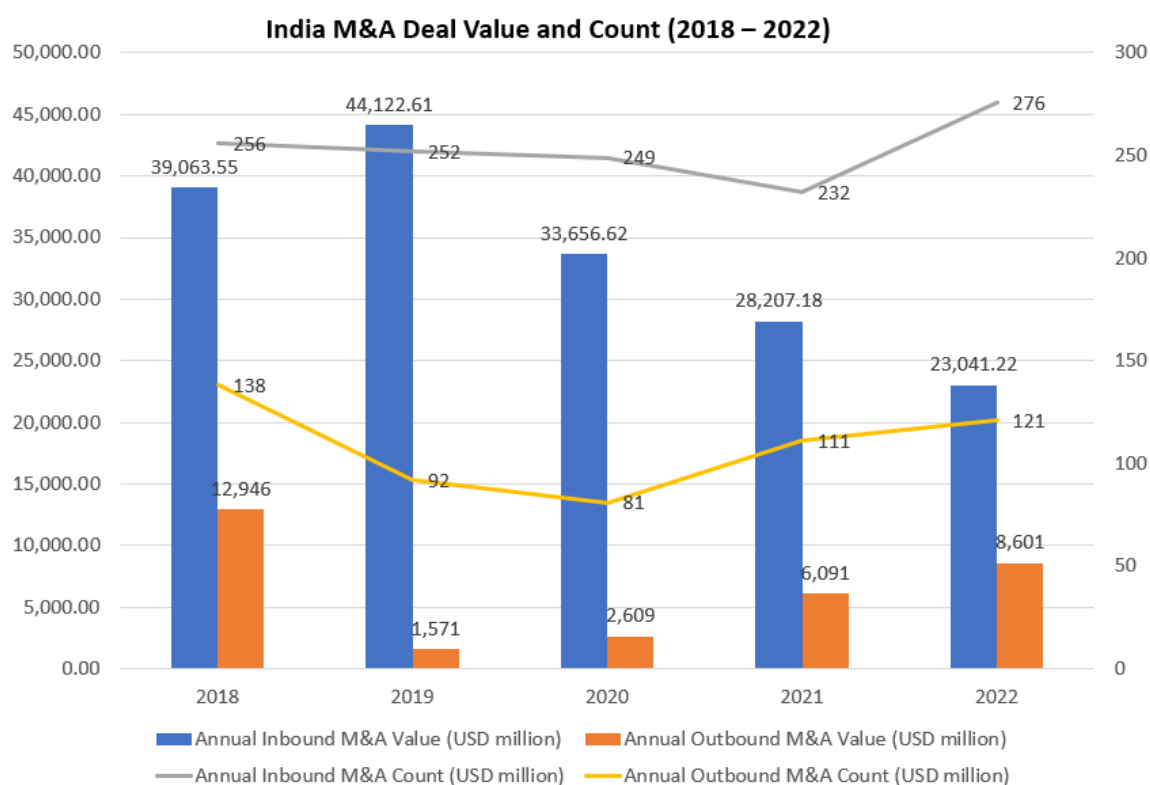
Transformation Through Value Creation

Utilizing M&As to acquire technology and expertise for digital transformation is a viable strategy for organizations seeking to enhance their digital capabilities. Many technological organizations utilize mergers and acquisitions as a growth strategy. Large technology enterprises are acquiring multiple companies, mostly for product portfolio expansion, talent acquisition, entry into new markets, and market share growth. At multiple levels, including cost, product, and strategic alignment, these acquisitions yield synergies.

The ultimate objective of any M&A transaction is to create value, a legitimate means of enhancing top-line growth and shareholder return. Transformation underpins practically every aspect of an M&A activity, with freshly enhanced solutions, cross-selling of acquired services,

and significant opportunities to streamline operations.

Exhibit 13: India M&A Deal value and Count (2018 – 2022)



Source: Frost & Sullivan, Secondary Sources

M&A: A Tool to Talent and Boost Capabilities

When pursuing acquisitions, Indian corporations mostly acquire companies that enhance their service offerings, strengthen their geo focus and domain expertise. In several instances, the acquisitions are part of a larger outsourcing agreement involving the rebranding of the client's IT workforce. Apart from Intellectual Property (IP), market and client access, talent is a major driver of acquisitions. In view of the large attrition rate, the approach towards acquisitions is evolving to be twofold: to enhance capacity and to bolster access to talent resources. For instance, the acquisition of a captive delivery centre often adds 1,000 to 2,000 personnel to a company's talent pool, whereas the acquisition of a small technology-specific service provider typically adds between 50 and 500 employees.

Some examples of a talent-focused M&A include:

- Wipro acquired Rizing to bolster its onshore SAP consulting capabilities, while Infosys acquired Oddity to strengthen its digital capabilities in Germany.
- In May 2022, Larsen & Toubro Infotech (LTI) and Mindtree announced plans to merge, resulting in an entity with a combined revenue of approximately USD 3.5 billion. This merger

was primarily motivated by the need to consolidate human resources and become a competent competitor to Tier 1 service providers.

From a capacity aspect, most businesses utilize M&A to empower their expansion strategy. Large technology businesses are acquiring many companies, mostly for product portfolio expansion, talent acquisition, entry into new markets, and market share growth. On numerous levels, including cost synergies, product synergies, and organizational alignment, acquired enterprises yield synergies.

Examples of M&A's focused on capacity building include:

- Wipro's acquisitions of London-based IT consultant Capco for USD 1.5 billion in 2020 and SAP consulting business Rizing for USD 550 million earlier this year are viewed as important capacity builders.
- The acquisition of Germany's Postbank in 2020 provided TCS with a solid foothold in the German retail banking sector and brought over 1,500 workers into the organization as part of an existing client arrangement.
- The W12 acquisition by TCS and the Wongdoody acquisition by Infosys began to generate significant traction for their design and metaverse-related solutions, mostly because of the digital transformation boom.

A few more examples of M&A deals in the Indian technology diaspora:

- Happiest Minds Technologies Limited acquired 100% ownership of SMI, a Madurai-based IT services company. EY (Ernst & Young) broadened its presence in India through the acquisition of eBorn Consulting, a provider of SAP solutions. It enhanced EY's technology consulting practice while capitalizing on geographical advantages.
- Larsen & Toubro (L&T) Infotech (LTI) merged with Mindtree, forming LTIMindtree, a formidable USD 3.5 billion IT consulting, services, and software entity.
- Mphasis Corporation, a subsidiary of India's Mphasis Ltd, acquired Sonnicks Partners LLC, operating as Silverline, for USD 132 million. This move extends Mphasis' footprint in the Salesforce service sector, enhancing its position as a leading provider of comprehensive Salesforce enterprise cloud solutions and services. The acquisition is strategically aligned with Mphasis' goal to offer clients robust capabilities that align with a cloud-first digital transformation strategy.

M&A: Key Acquisition Themes:






As we look ahead, the technology sector will continue to experience high deal volumes, as digital adoption boosts global market influence and relevance. In the first half of 2023, software deals alone amounted for over a quarter of the total worldwide deal value across all industries. In India, technology mergers and acquisitions are dominated by IT and emerging technology agreements, with the latter fuelled by a large amount of private equity activity and a healthy start-up ecosystem ready for consolidation.

For acquirers, some of the key themes surrounding M&A within the technology sector are as follows:

1. **Scalability:** Mergers and acquisitions are pursued by acquirers to strengthen market competitiveness through expansion. Acquisitions would increase market presence, broaden the clientele, and provide opportunity to compete with larger competitors. In addition, economies of scale would boost operating profits for acquirers.
2. **IP and Automation Footprint:** To effectively use new technologies to address market challenges, enhance services, and manage talent shortages while helping to keep operating costs low, strategic acquirers are paying premium valuations to acquire targets having embedded intellectual property in emerging technology areas (AI/ML, RPA, etc.).
3. **Focus on Nearshore Delivery:** The Latin American and Eastern European regions are particularly appealing to buyers because to the availability of talent, strong English proficiency, better potential for real-time collaboration, and cost advantage.

In terms of technology, M&A trends tend to gravitate towards emerging technologies ranging from cloud adoption to Big Data Analytics. Some of the key capability areas within these technologies that are focal points for M&A are listed below:

Exhibit 14: M&A Key Focus Areas Within Emerging Technology Services

Technology Area		M&A Focus Areas
Cloud		<ol style="list-style-type: none"> 1. Cloud Enablers (IaaS/SaaS/PaaS) 2. Managed Services 3. SaaS based applications
Cybersecurity		<ol style="list-style-type: none"> 1. Application, Cloud, Data, Network Security 2. Managed Detection & Response 3. Risk, Governance & Compliance
Customer Experience		<ol style="list-style-type: none"> 1. Digital Commerce 2. Creative/Marketing Agencies
Digital Engineering		<ol style="list-style-type: none"> 1. Product Development 2. DevOps
Big Data & Analytics		<ol style="list-style-type: none"> 1. Data Engineering 2. Business Analytics 3. Vertical Specific Capabilities

Source: Frost & Sullivan

6 India: A Hub of Innovation

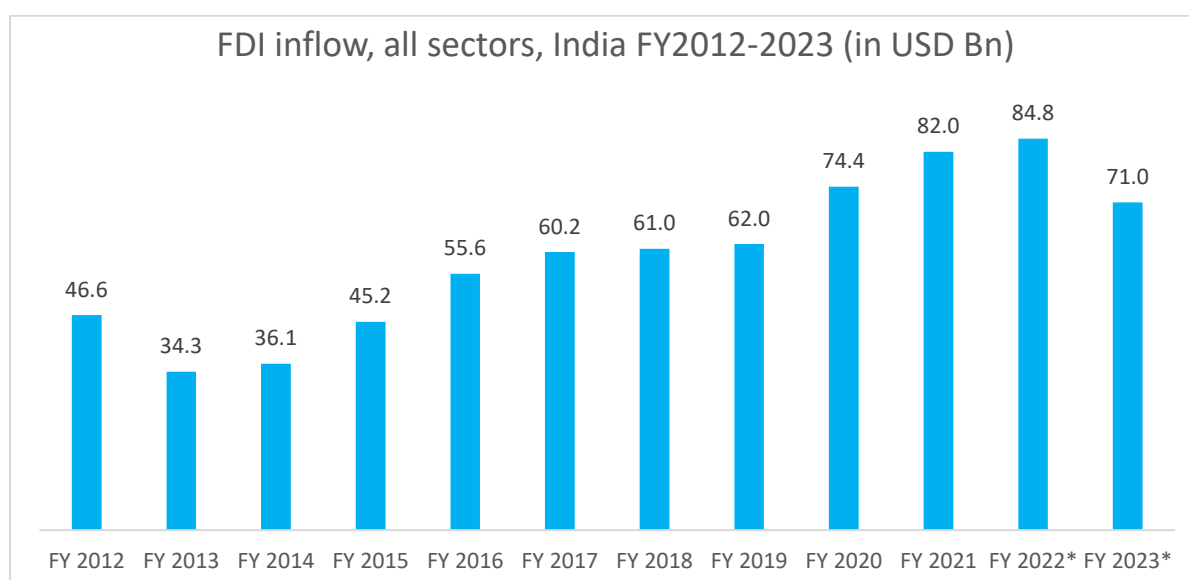
6.1 India : A Hub of Innovation

India's emergence as an engine in global technology innovation is not a surprising index. India has significantly contributed to the world's status as a centre of innovation over the last few decades. Whatever the problem, India has a solution, as evidenced from everything from helping the world cope with the historic Y2K crisis to providing business resilience for the world through the bleak days of the Covid-19 pandemic.

- The Indian technology industry today has a presence in over 100 countries and draws on employees of over 150 nationalities.
 - India also ranks at number three in global ranking in terms of research publications. The country is now the third most attractive investment destination for technology transactions and also one of the largest start-up ecosystems in the world.
 - As per data published by the US Department of State, nearly 200,000 Indian students in the country contribute USD 7.7 billion annually to the US economy.
 - India is currently home to 108 unicorns with a combined valuation that exceed USD 340 billion. The high number of start-ups is part of the reason India rose in the World Intellectual Property Organization’s Global Innovation Index ranking, from 81 in 2015 to 40 in 2023.
 - India has also demonstrated the important role of technology to advance equitable development through efforts to promote digital empowerment and last-mile financial inclusion, as evidenced by the Digital India Mission and Aadhar scheme
- 1. Economic Reforms and High FDI Influx:** By bridging the investment gaps in capital deficit economies and supporting economic growth, foreign direct investment (FDI) contributes significantly to the economic development of any nation. The current fiscal year's estimated USD 71 billion in FDI inflow into India is being backed by several groundbreaking economic reforms and a notable ease of doing business. During the FY2023, various sectors in India garnered considerable attention from foreign investors. The computer software and hardware industry experienced the highest Foreign Direct Investment (FDI) inflows, amounting to USD 9.39 billion. Additionally, the services sector attracted substantial foreign investment, reaching USD 8.70 billion, encompassing financial, banking, insurance, and business services.

6.2 India: Value proposition and a destination of choice

Exhibit 15: FDI inflow, all sectors, India FY2012-2023 (in USD Bn)



Source: Department for Promotion of Industry and Internal Trade (India); Reserve Bank of India

*Projections

Note: Total FDI includes equity inflows, re-invested earnings and other capital.

2. **Country's Cultural fiber:** Success of businesses globally is attributed to political and cultural factors. India's stable democracy, characterized by the rule of law, forms a foundation for business stability. Additionally, there is a cultural emphasis on customer service, reflecting a commitment to ensuring client satisfaction. Indian firms are recognized for their willingness to go the extra mile to deliver results, which is considered a key aspect of their success. These factors collectively provide Indian companies with a competitive advantage over counterparts in several other countries, fostering a conducive environment for sustained business success.
3. **Low-Cost Labor:** India continues to be one of the nations with a cost-effective labour force despite growing wages in 2023 and the current tech skills being in extremely high demand. Wage costs for IT professionals in India are lower than comparable wage costs in more developed countries. When compared to several Asian and EMEA nations, the cost arbitrage still gives the nation a clear advantage. In fact, one of the main factors making India a popular location is the cost of labour.
4. **Talent Reservoir:** With 5.2 million talent pools devoted to software product engineering, India ranks first in the world. It is also one of the top three nations that annually produce the most STEM (science, technology, engineering, and mathematics) graduates. There are 1.5 million STEM graduates worldwide each year, which is more than three times the number of STEM graduates in the United States each year (40 percent of them are women). Organizations seeking to grow their teams and accelerate their innovation goals can train and use this vast talent pool of highly skilled English-speaking tech professionals at scale. In terms of modern skill sets like data analytics, India is home to one-fourth of the world's talent.
5. **Focus on Emerging Tech and Innovation:** Technology solutions are undergoing a paradigm transition in India, from 5G to cloud to AI/ML. Technology advancements in the fields of finance, data security, internet of things, food technology, e-commerce, and logistics are expected to find prominence in 2023. The importance of data engineering to organizations has increased in recent times. Also, with respect to RPA & robotics, the automation sector has seen a tremendous uptick.

6.3 Digital Talent as a Critical Success Factor

In India's thriving tech industry, the workforce currently surpasses 5.4 million individuals, with the digital sector constituting a significant 36%-38% of the industry's total employment. The digital talent gap within the tech industry is poised to expand from its existing 25% to an estimated 28-29% by the year 2028. In the academic year 2022-23, India emerged as a global leader in the supply of STEM graduates, contributing a staggering 2.5

million individuals. Even then, there is extensive competition within the Indian technology market with respect to hiring, owing to an increasing number of players and services.

- **Utilizing Latent Digital Potential:** The Indian IT industry offers a fantastic opportunity to introduce unskilled workers into the workforce in addition to hiring and training digitally competent professionals. Utilizing the nation's untapped resources will require the application of outcome-based models where support with training and placement is offered. The same is true for Tier 2 and Tier 3 cities' raw talent
- **Quality over Outsourcing:** Global MNCs are looking for India to become the "Talent Nation" because of the rapid global digitization; gone are the days when work was outsourced to India to save money; now it is outsourced to the country as a source of high-quality talent.
- **Innovative Learning Models:** Companies in the IT sector have started to use apprenticeship programmes at scale, not just for a certificate, but coupled with assessments. By investing in building world-class free content that can be leveraged by anyone and aligned with a credible system of certification, it will be much easier to produce a workforce that is digitally equipped with the latest developments within the technological sector.
- **Emphasis on Training:** With the perpetual evolution of technological trends, organizations must offer training and upskilling opportunities to their employees continuously. This not only enhances their overall employability but also addresses the existing disparity, as only 10% of engineering graduates in India are deemed employable, and merely 12% possess digital skills training. For example, the demand for expertise in the cloud domain surpasses the available supply, with a 24% supply against a 38% demand. The scarcity of individuals equipped with skills in emerging technologies such as artificial intelligence, machine learning, blockchain, Internet of Things, cybersecurity, and data analytics exacerbates the challenge. To bridge this gap, the country needs millions of training sessions, particularly in key focus areas like Artificial Intelligence, Machine Learning, Data Science, and Internet of Things. Enterprises are now prioritizing core skills and digitally empowering their workforce to stay updated on the latest technological advancements. Recognizing the need for comprehensive training, Nasscom has introduced an inclusive platform known as "Future Skills Prime," providing training in both hard and soft skills.
- **Emerging IT Hubs:** Hyderabad's emergence as a critical IT hub in India significantly contributes to the nation's digital talent landscape. Once a challenger to Bangalore's established IT dominance, Hyderabad has seen remarkable growth in its IT industry. In the financial year 2022-23, Telangana, with Hyderabad at its center, recorded a staggering 31.44% growth in IT exports and a 16.29% increase in job creation in the IT sector. This growth is exemplified by the fact that Hyderabad accounted for a third of the 450,000 IT jobs created in India last year, outpacing Bangalore's contribution significantly. Hyderabad's startup ecosystem is also thriving, with a growing number of tech startups establishing their base in the city. T-Hub, India's largest incubation centre, has played a significant role in nurturing entrepreneurship and innovation in Hyderabad, connecting startups with influential stakeholders in the ecosystem.

- a. Chennai's startup ecosystem is thriving as well, marked by the success of companies like Freshdesk and Indix, propelling it into international recognition. With proactive support from the Tamil Nadu government, Chennai has transitioned into an attractive market for entrepreneurs, leveraging its literate population and skilled technical talent. The city's focus has shifted from the automobile industry to becoming a prominent IT hub, drawing major companies and witnessing a surge in entrepreneurship. As India's second-largest software exporter after Bangalore, Chennai hosts major IT and tech companies like Infosys, Cognizant, Wipro, TCS, and Accenture. The city's success in the BPO sector and e-publishing industry, coupled with top-notch engineering colleges, has attracted a wealth of talent, solidifying its position as a significant IT hub.
- b. Noida in Uttar Pradesh is swiftly becoming an investment hotspot, attracting major IT firms, telecom giants, and data centers. The region's growth prospects, fueled by the upcoming airport and robust infrastructure, are luring investors and real estate developers alike. This region's appeal lies in its future potential as a thriving tech hub, challenging established cities like Gurgaon and Bengaluru. IT giants such as HCL, Tech Mahindra, and Microsoft have already established their presence, with Microsoft planning a substantial data center project, anticipating an investment of Rs 1,800 crore and the generation of 3,000 jobs.

6.4 Various growth drivers in the industry

Cost Competitiveness:

One of the foundational drivers for the Indian IT sector's rise has been its cost advantage. Offering world-class services at a fraction of the cost compared to Western counterparts, India quickly became a preferred IT outsourcing destination. The abundant availability of skilled labour at competitive wages provided a significant edge. This cost arbitrage made it possible for companies to deliver top-tier services without compromising on quality. Apart from labour, operational costs, including infrastructure and utilities, are relatively lower in India. This combination of low labour and operational costs results in sizable savings for foreign companies.

Talent Pool and Education System:

India's education system, particularly its engineering and IT institutions, churns out a vast number of graduates annually, feeding the IT industry with a steady stream of talent. Premier institutions like the IITs, NITs, and various private engineering colleges ensure a consistent supply of well-trained professionals. The government, along with private players, has initiated various skill development and training programs tailored to meet the evolving demands of the IT sector.

Government Policies and Initiatives:

The Indian government has been proactive in recognizing the potential of the IT sector and has put forth policies that promote its growth. The establishment of Software Technology Parks and Special Economic Zones offers tax breaks, high-speed internet connectivity, and state-of-the-art

infrastructure. Initiatives like Digital India aim to transform the entire country into a digitally empowered society, indirectly boosting IT-related endeavours.

Entrepreneurial Ecosystem:

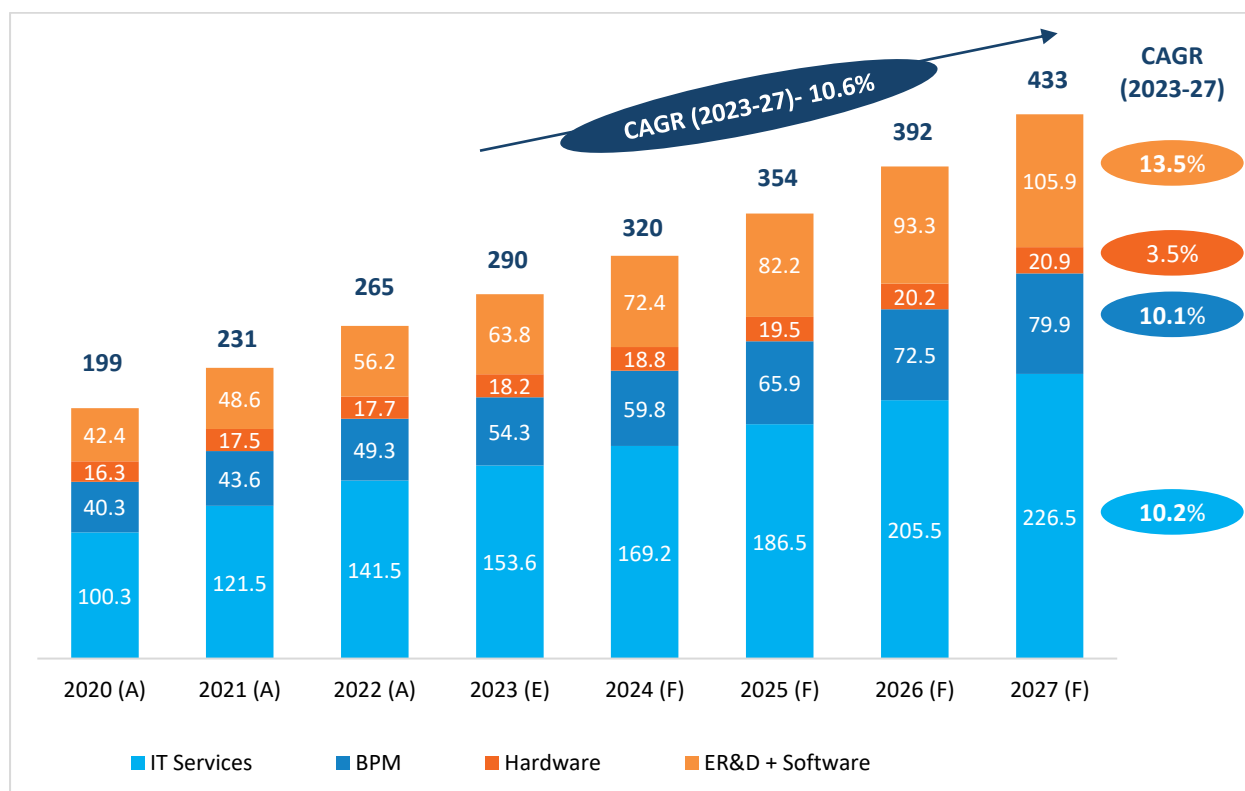
Over the past decade, India has seen a surge in startups, many in the IT and tech domain. The influx of venture capital and angel investments has propelled many Indian startups into global entities. Cities like Bengaluru, Hyderabad, and Pune have turned into innovation hubs, fostering collaboration, ideation, and driving technological advancements.

7 India Technology Market

7.1 India Technology Market Size

India's prominence as the world's prime offshore destination for IT companies continues to grow, with emerging technologies fostering a plethora of opportunities for the nation's top-tier IT firms.

Exhibit 16: India Technology Market Size, FY 2020-27, USD Billions



Source: Frost & Sullivan, Secondary Sources

The Indian technology market is characterized by intense competition, propelled by the influx of numerous players and a broad spectrum of services. In the medium to long term, IT services firms are well-placed to leverage various margin levers, such as pyramid balancing, competitive pricing, and reduced subcontractor costs, coupled with operational leverage. These strategies will serve as buffers against potential headwinds, including escalating wage revisions, supply-side challenges, and the revival of travel and facility expenses post-pandemic.

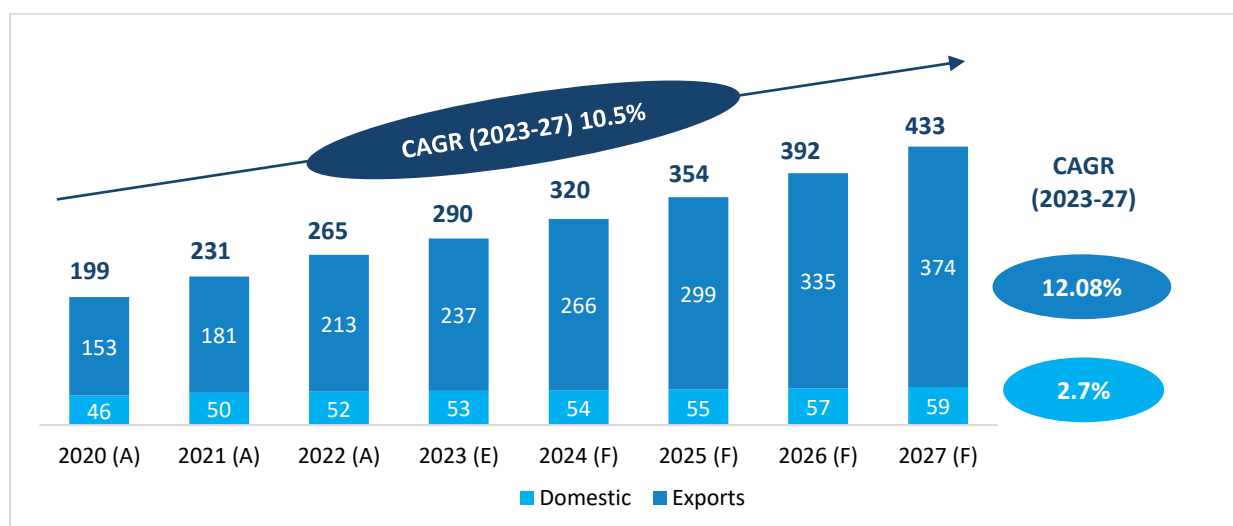
The IT services segment is expected to witness a substantial growth, scaling from USD 153.6 billion in 2023 to a forecasted USD 226.5 billion in 2027, growing at a CAGR of 10.2% (2023-27). This trajectory is a clear reflection of the sector's resilience and adaptability in the face of evolving market dynamics. The Business Process Management (BPM) sector is not far behind, with its growth curve expected to ascend from USD 54.3 billion in 2023 to a projected USD 79.9 billion in 2027, growing at a CAGR of 10.1% (2023-27). The demand for specialized capabilities in AI & Analytics, platform-based solutions, and automation-related services is expected to fuel this surge.

Hardware and ER&D + Software sectors have also exhibited notable growth. The hardware sector, albeit growing at a comparatively steadier pace, is expected to evolve from USD 18.2 billion in 2023 to a forecasted USD 20.9 billion in 2027, growing at a CAGR of 3.5% (2023-27). The growth of the IT and telecom sectors is likely to have a positive impact on the hardware industry, as these sectors are significant consumers of hardware products. On the other hand, the ER&D + Software sector has shown significant expansion, with its value expected to escalate from USD 63.8 billion in 2023 to a predicted USD 105.9 billion in 2027, growing at a CAGR of 13.5% (2023-27). The ER&D and Software sector in India is expected to grow exponentially, driven by the increasing demand for software products and services, both domestically and globally.

7.2 Industry Revenue Split by Domestic Vs. Exports

Exports from the industry have been constantly increasing as the IT industry in India continues to engage in large-scale deals with global companies.

Exhibit 17: IT Industry Revenue by Domestic Vs. Exports, FY 2020-27, USD Billion

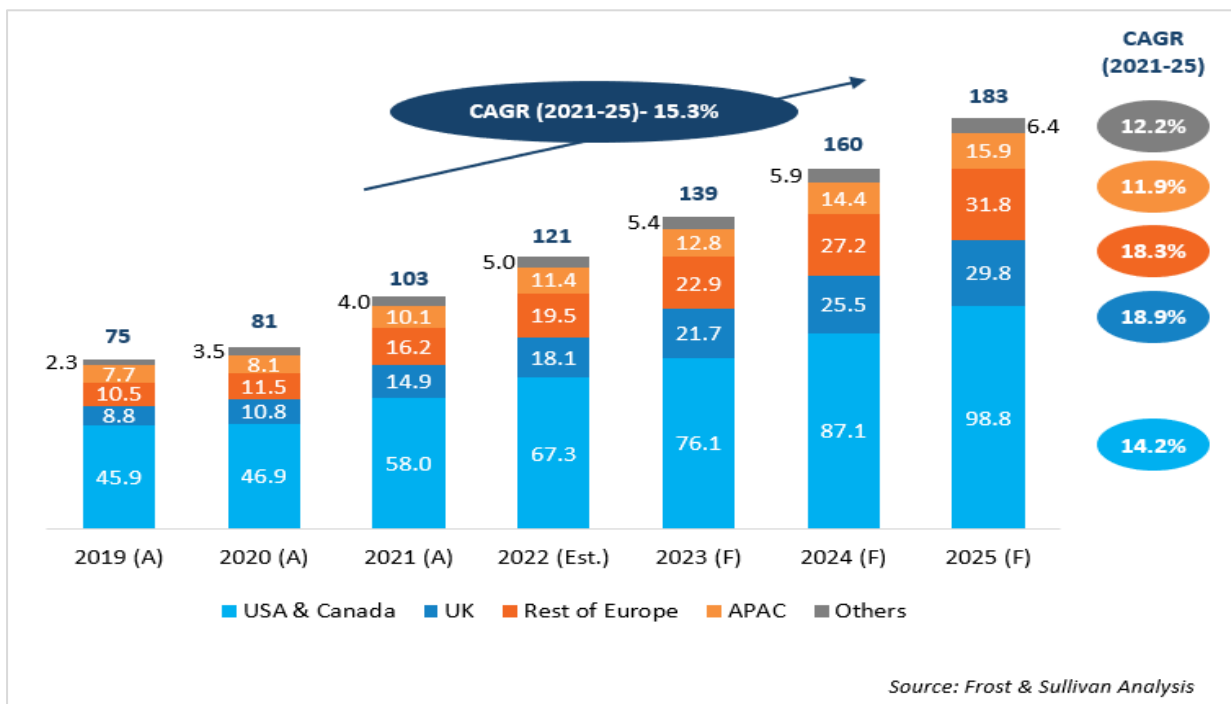


Source: Frost & Sullivan, Secondary Sources

The growth of IT service exports will stay healthy owing to digital engagements and solutions being predicted as major drivers for delivering business value in the future. IT service providers are expanding from pure services to platform-plus-services model thereby creating more opportunities within the landscape. Domestic IT services is expected to grow at a CAGR of 2.72%

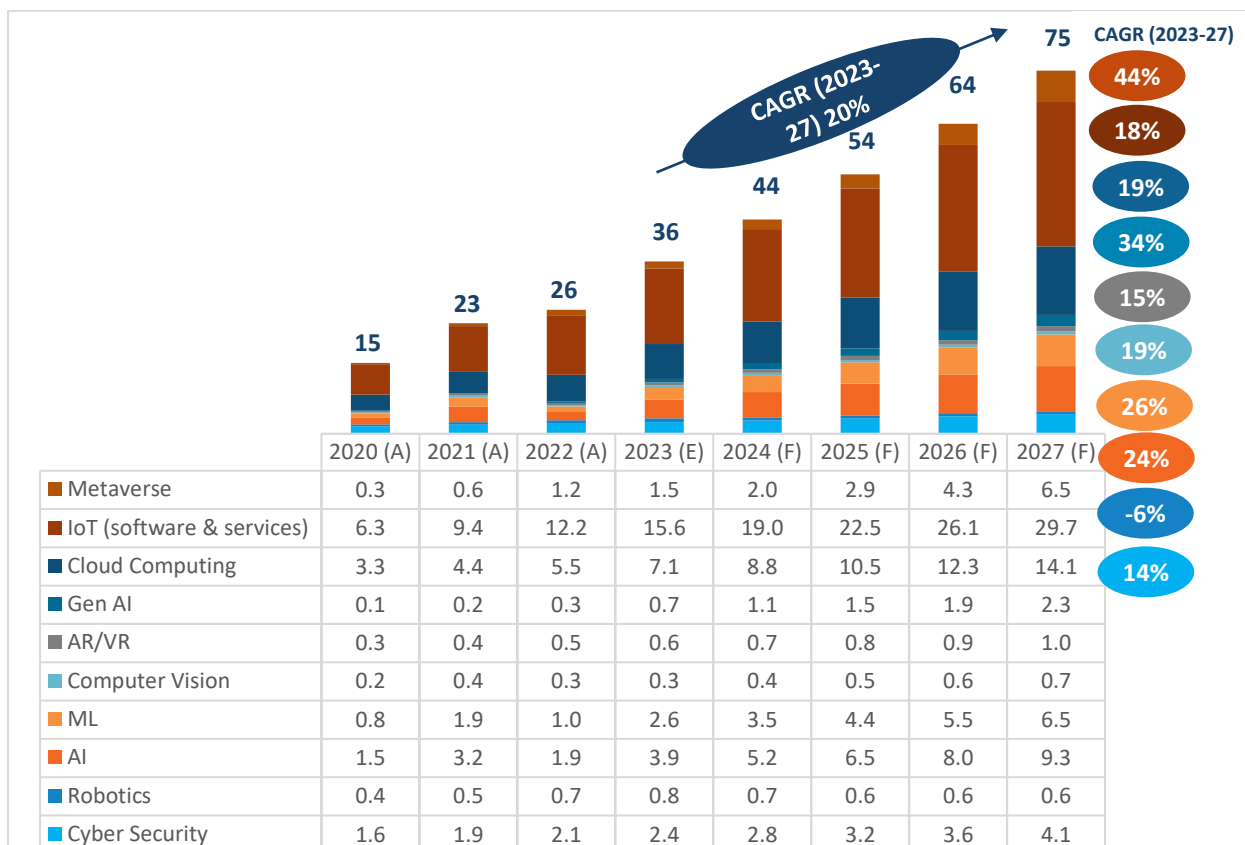
(2023 – 2027) while IT exports is expected to grow at a rate of 12.08% (2023 – 2027) during the period.

Exhibit 18: Geographic Breakup of Indian IT Services Export Revenues, FY2019-2025 (USD Billion)



7.3 Industry Revenue Split Across Key Technology Solution Areas

Exhibit 19: India IT spend across key technologies, FY 2020-27, USD Billion



Cybersecurity spending within the Indian IT sector is set to climb from USD 1.6 billion in 2020 to USD 4.1 billion in 2027, growing at a CAGR of 14% in the 2023-2027 period, driven by the increasing need for robust digital security measures to protect against evolving cyber threats in the Indian IT landscape.

With an anticipated increase from USD 0.4 billion in 2020 to USD 0.6 billion in 2027, the robotics sector is gaining traction across industries like manufacturing and healthcare in India, which are seeking automation solutions for enhanced precision and efficiency.

AI spending is forecasted to surge from USD 1.5 billion in 2020 to USD 9.3 billion in 2027, propelled by its integration into diverse sectors such as healthcare, finance, and retail within the Indian IT ecosystem, growing at a CAGR of 24% in the 2023-2027 period.

The machine learning sector in India is set to witness a significant growth, with its spending projected to increase from USD 0.8 billion in 2020 to USD 6.5 billion in 2027, as various industries leverage ML to analyse large datasets and extract valuable insights, growing at a CAGR of 26% in the 2023-2027 period.

Computer vision technology is expected to see its spending climb from USD 0.2 billion in 2020 to USD 0.7 billion in 2027, driven by its applications in image recognition and object detection across retail, automotive, and healthcare industries in India, growing at a CAGR of 19% in the 2023-2027 period.

The Others category such as AR/VR sector is forecasted to grow from USD 0.3 billion in 2020 to USD 1.0 billion in 2027, with its applications expanding beyond gaming to include education and training in the Indian IT sector, growing at a CAGR of 15% in the 2023-2027 period.

General AI spending is anticipated to rise from USD 0.1 billion in 2020 to USD 2.3 billion in 2027, spurred by advancements in robotics, natural language processing, and other fields within the Indian IT landscape, growing at a CAGR of 34% in the 2023-2027 period.

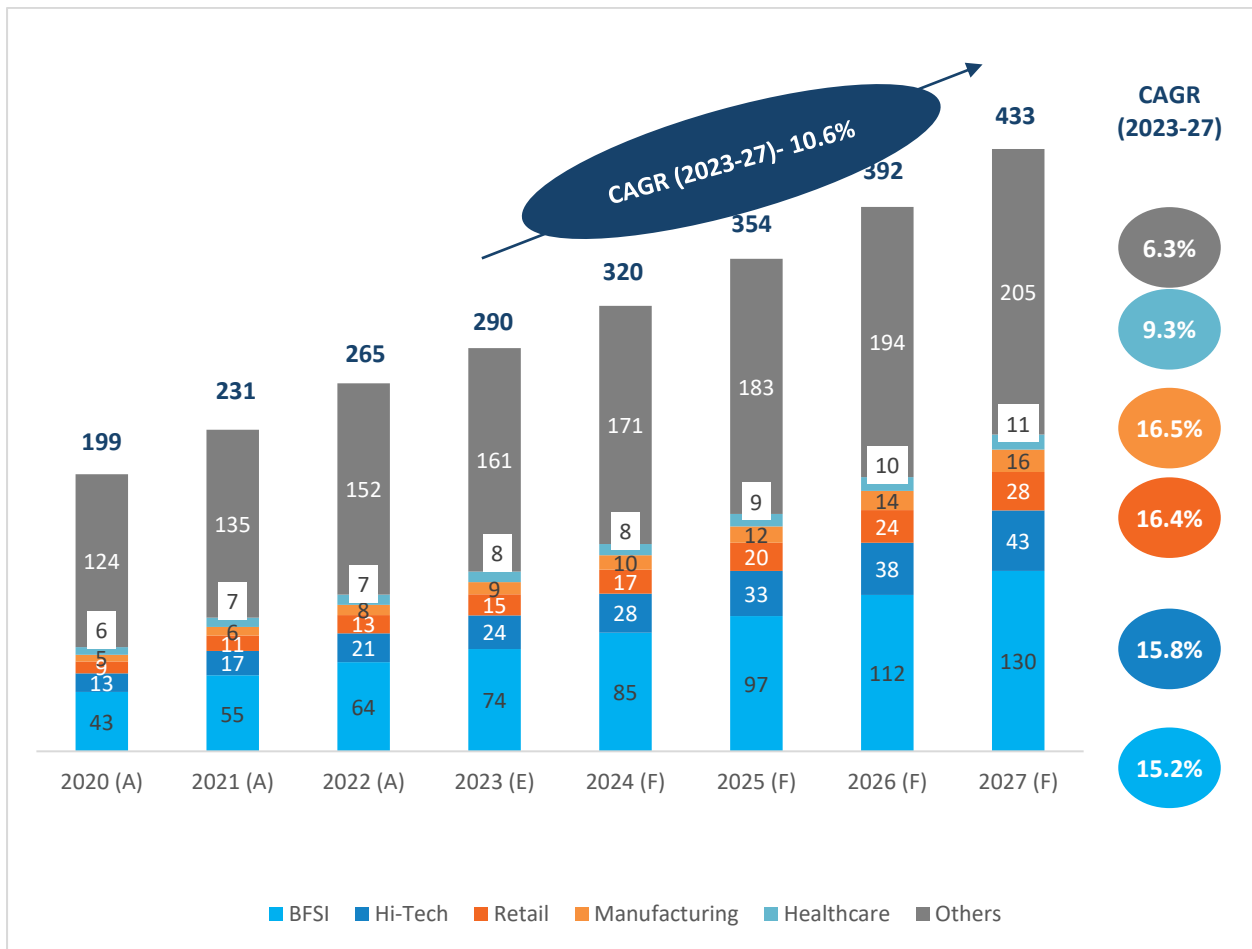
The shift towards cloud-based solutions in India is evident in the expected growth of cloud computing spending, from USD 3.3 billion in 2020 to USD 14.1 billion in 2027, as businesses seek scalable, flexible, and cost-effective alternatives for storage and computing, growing at a CAGR of 19% in the 2023-2027 period.

The Internet of Things is poised to transform businesses' ability to gather real-time data and improve operational efficiencies in India, with its spending expected to increase from USD 6.3 billion in 2020 to USD 29.7 billion in 2027, growing at a CAGR of 18% in the 2023-2027 period.

As the Indian IT sector invests in building the infrastructure for the metaverse, a virtual shared space that promises to revolutionize digital interactions, spending in this segment is predicted to jump from USD 0.3 billion in 2020 to USD 6.5 billion in 2027, growing at a CAGR of 44% in the 2023-2027 period.

7.4 IT Services: Split Across Various Industry Verticals

Exhibit 20: Technology Spend Across Industry Verticals, FY 2020-27, USD Billion



Source: Frost & Sullivan, Secondary Sources

In the Indian IT sector, the Banking, Financial Services, and Insurance (BFSI) industry has significantly escalated its technology spending from USD 42.7 billion in 2020 to a projected USD 129.9 billion in 2027, growing at a CAGR of 15.2% (CY2023-2027), propelled by the rapid digitization of banking services and increased focus on cybersecurity to protect sensitive customer data. Concurrently, the Hi-Tech sector has not been left behind, with its spend increasing from USD 13.5 billion to a projected USD 43.4 billion in the same period, growing at a CAGR of 15.8% (CY2023-2027), primarily due to investments in cutting-edge technologies like 5G, IoT, and artificial intelligence that are pivotal for product innovation and service delivery.

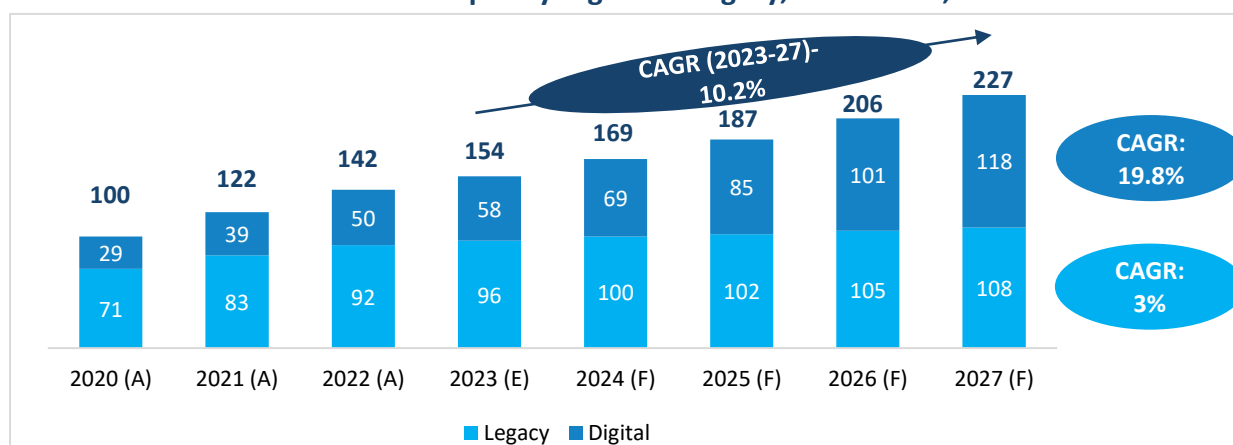
Furthermore, the Retail industry has harnessed the power of technology, growing its spend from USD 8.5 billion in 2020 to a projected USD 27.5 billion in 2027, growing at a CAGR of 16.4% (CY2023-2027), with a focus on enhancing customer experiences through the integration of AI and analytics, alongside the adoption of e-commerce platforms. Manufacturing, on the other hand, has seen a surge in technology spend from USD 4.7 billion in 2020 to a projected USD 16.1 billion in 2027, growing at a CAGR of 16.5% (CY2023-2027), with the industry emphasizing the importance of automation and data analytics to improve operational efficiency and production processes.

Lastly, the Healthcare industry, with its projected growth from USD 5.6 billion in 2020 to USD 10.9 billion in 2027, growing at a CAGR of 9.3% (CY2023-2027), is leveraging technology to facilitate remote patient monitoring and telemedicine, especially in the wake of the global pandemic.

7.5 IT Services: Split Across Digital/Legacy Technology Services

Digital services are expected to gain significant traction going forward and witness a growth of 19.8 per cent year-on-year (CY2023-2027) to reach USD 118.5 million by 2027. Legacy services at the same time is expected to grow at a CAGR of 3% only during CY2023-2027.

Exhibit 21: IT Services: Split by Digital Vs Legacy, FY 2020-27, USD Billion



Source: Frost& Sullivan, Secondary Sources

The need to move towards a digital economy has led to service providers and IT companies focusing towards up-skilling and reskilling their workforce to develop an ecosystem for new-age products/solutions.

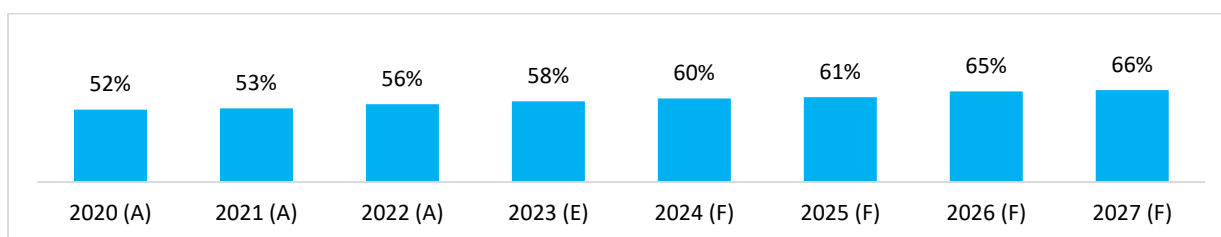
The growth of digital services is expected to be higher than that of the legacy segment owing to the attractiveness of cost-effective digital alternatives to traditional solutions. Moreover, more and more enterprises want to digitally transform themselves to stay ahead of the technology curve and make their operations sustainable to stay competitive. Many organizations, particularly within the IT space, have already implemented digital services within their workspace (such as automation of internal functions) to bolster productivity and drive cost efficiency.

Technology convergence has added another layer of opportunity to the growing digital workforce, which is constantly looking to create monetizing avenues from available options.

7.6 India's Share in the Global IT Outsourcing Services

The global IT outsourcing services market has witnessed a paradigm shift over the past few decades, with India emerging as a powerhouse. The blend of a skilled workforce, cost-effectiveness, and a conducive policy environment has catapulted India into a dominant position in this market.

Exhibit 22: India's Share in the Global IT Outsourcing Market, FY 2020-27, in USD Billion



Source: Frost& Sullivan, Secondary Sources

Drivers of Growth:

Cost-Effectiveness:

The comparative lower labour costs in India vis-a-vis other regions provide a compelling cost advantage to global firms looking to outsource IT services. This cost arbitrage is a potent driver for India's growing share in the global IT outsourcing market.

Skilled Workforce:

India's vast pool of skilled IT professionals is a cornerstone of its success in the IT outsourcing domain. The country's educational system, with a strong emphasis on science and technology, churns out a large number of IT graduates annually, ready to cater to the global demand for IT services.

Technological Advancements:

India has been swiftly adapting to new technological trends, including cloud computing, artificial intelligence, and machine learning. This technological prowess enhances India's appeal as a go-to destination for sophisticated IT services, thereby potentially increasing its market share.

Government Initiatives:

The Indian government's supportive policies, including the promotion of IT hubs and Special Economic Zones (SEZs), create a conducive environment for the growth of the IT outsourcing market.

Infrastructure Development:

Continuous infrastructure development, including the establishment of state-of-the-art IT parks, fosters a favourable ecosystem for global companies to outsource their IT services to India.

Quality of Services:

The emphasis on delivering high-quality services and adherence to international standards have earned Indian IT firms a reputation for reliability and excellence, further attracting global businesses.

3 Competitive Landscape

3.1 Key Service Providers Profiled

MPHASIS

Mphasis aims to serve as the driving force behind global enterprises, applying cutting-edge design, architecture, and engineering services to deliver scalable and sustainable software and technology solutions. Customer centricity is fundamental to Mphasis and is evident in its Front2Back™ Transformation approach, leveraging the power of cloud and cognitive technologies for hyper-personalized digital experiences. Through the Service Transformation approach, Mphasis streamlines core operations with digital technologies, ensuring businesses remain at the forefront of a dynamic landscape.

Mphasis, as a leader in the industry, prioritizes design and architecture to deliver an array of next-generation offerings and services. The company seamlessly combines deep domain expertise with cutting-edge technology in its contextualized offerings, driven by the Mphasis Tribes and Squads model. Cross-functional teams, committed to advancing next-gen offerings, operate under the Mphasis Way of engagement, streamlining building and scaling processes. This approach aims to reintegrate the 'T' back into IT, where 'T' represents not only technology but also transformation with a comprehensive understanding of the business domain.

According to IPqwey, Mphasis has successfully registered 17 trademarks, with the most prevalent class being 'Scientific and technological services'.

Their go-to-market strategy underwent a realignment, prioritizing dedicated farming and strategic hunting. This shift involves leveraging domain expertise specifically aligned with key industry verticals in the target markets. BFSI remains their primary revenue contributor, with strategic accounts and the New Client Acquisition channel driving their successes. The new engines of growth include Healthcare, Travel, Transportation & Logistics, Hi-Tech, and Insurance.

PERSISTENT

Established in 1990 and based in Maharashtra, India, Persistent stands as a reliable partner in Digital Engineering and Enterprise Modernization. The company seamlessly integrates profound technical expertise with extensive industry experience, focusing on domains such as banking and finance, insurance, healthcare, and more.

Their comprehensive offerings and established solutions provide clients with a distinct competitive advantage, empowering them to gain insights beyond the immediate and elevate their position in the market.

Operating as both a market leader and an industry challenger in driving Digital Engineering outcomes, they actively embrace new ideas and technological breakthroughs for advanced enterprise modernization.

Backed by investments and partnerships, they possess the scale of a large global firm while maintaining a size that allows for personalized service and genuine care. As one of the fastest-

growing providers in their sector, they have achieved US \$1 billion in revenue, showcasing growth that surpasses competitors.

COFORGE

CoForge stands as a prominent global IT solutions organization, facilitating clients' transformation at the convergence of domain expertise and emerging technologies to realize tangible business outcomes. Founded in 1992, CoForge is headquartered in New Delhi, India.

Coforge is a worldwide provider of digital services and solutions, harnessing emerging technologies and profound domain expertise to generate tangible business value for its clients. Emphasizing specific industries, an in-depth comprehension of their underlying processes, and collaborations with prominent platforms contribute to its unique perspective. Coforge adopts a product engineering approach, leading with Cloud, Data, Integration, and Automation technologies to propel client businesses into intelligent, high-growth enterprises. Proprietary platforms from Coforge drive essential business processes across its core verticals. With a presence in 21 countries and 26 delivery centers across nine countries, the firm extends its global reach.

Coforge collaborated with Microsoft for next-gen enterprise solutions using Generative AI, launched Quasar Responsible AI, and secured a spot in India's Top 100 Best Workplaces in IT & IT-BPM for 2023, marking its second consecutive recognition.

In FY 2023, consolidated revenues surged by 24.6%. The growth was primarily driven by a 47.0% increase in the BFS vertical, contributing 30.7% to total revenues. The TTH vertical grew by 21.5%, constituting 19.1% of total revenues. However, the Insurance vertical experienced a 3.7% decline, contributing 22.6% to total revenues. Other verticals collectively grew by 23.1% year-on-year, representing 27.5% of the overall revenues.

Happiest Minds

Happiest Minds is a pioneering force in the realm of digital transformation and technology solutions. Established in 2011, the company has swiftly ascended to prominence, becoming a trusted partner for businesses seeking to navigate and excel in the digital age. With a steadfast commitment to innovation and client satisfaction, Happiest Minds offers a diverse array of services encompassing digital business solutions, product engineering, data analytics, infrastructure management, security, testing, consulting, cloud computing, networking and more. What sets Happiest Minds apart is its unwavering focus on understanding and addressing the unique needs of each client, ensuring that solutions are not only cutting-edge but also tailored to deliver measurable business value. Backed by a team of seasoned professionals and a culture of agility and adaptability, Happiest Minds stands poised to empower organizations across industries to harness the full potential of digital technology for sustainable growth and success.

SONATA SOFTWARE

Based in Bangalore, Sonata Software Limited stands as a prominent modernization engineering company. Utilizing its proprietary Platformation™ approach, Sonata specializes in offering

modernization services, including cloud and data modernization, Microsoft Dynamics Modernization, Digital contact center setup and management, managed cloud services, and digital transformation services.

Since its establishment in 1986, the company has expanded its presence to North America, Europe, ANZ, and Asia-Pacific. Sonata maintains strategic partnerships with key technology providers such as Microsoft, Amazon, Google, among others, and has garnered numerous awards and recognition for its services. Focused on innovation and customer-centricity, Sonata is dedicated to assisting businesses in accelerating their modernization and digital transformation journeys.

The company has inaugurated new development centers in Mexico and Costa Rica, enhancing its growth potential in the region. This move enables the delivery of services locally for US clients and positions the centers as nearshore delivery hubs for the Americas region. Alongside this development, the leadership team in the US has been reinforced to intensify focus on industry verticals and foster partnerships with ecosystem partners. The company has established solid partnerships in the region with major hyper-scalers and specialized technology firms. The implementation of a localization strategy, combined with a concentrated effort on industry verticals, is anticipated to facilitate the delivery of valuable modernization services to clients in the region.

BIRLASOFT

Birlasoft integrates domain, enterprise, and digital technologies to transform business processes for both customers and their ecosystems. The company's consultative and design thinking approach aims to enhance productivity within societies by assisting customers in effectively managing their businesses. Operating as a part of the multibillion-dollar diversified CK Birla Group, Birlasoft, with its team of over 12,500 professionals, remains dedicated to upholding the Group's 162-year legacy of contributing to the development of sustainable communities.

As an organization, they make regular investments in global partnerships that facilitate the co-development of solutions, ultimately enhancing their services. Their Advise-to-Execute philosophy serves as the foundation for their innovative capabilities. Through collaborative efforts with partners, they play a crucial role in helping customers accelerate their digital and cloud transformation journeys.

Birlasoft extends its services to companies in various sectors such as Automotive, Banking, Insurance, Manufacturing, Media and Entertainment, Life Sciences, and Energy and Resources. Across these sectors, their partnerships with technology leaders play a crucial role in expediting digital transformation initiatives and creating substantial value.

By strategically choosing technology solutions aligned with their near and long-term goals, enterprises can leverage technology as a pivotal business tool. Birlasoft collaborates with prominent technology providers globally, aiding clients in realizing their digital transformation objectives. They fine-tune platform configurations to unleash the maximum potential for value generation, minimizing in-house IT efforts and establishing a foundation for future transformations.

ZENSAR

Zensar stands out as a prominent provider of digital solutions and technology services, specializing in collaborating with global organizations throughout their digital transformation journey. Recognized as a preferred technology partner, Zensar boasts a robust history of innovation, significant investments in digital solutions, and a steadfast commitment to client success.

Offering a comprehensive array of digital and technology services, Zensar empowers its clients to reach new levels of business performance. With a proven track record of delivering excellence and ensuring high client satisfaction across various technology solutions, Zensar is uniquely positioned to assist clients in efficiently managing their existing business challenges. Moreover, the company plays a crucial role in facilitating legacy transformation and strategic planning for business expansion and growth through innovative digital solutions.

Zensar specializes in Testing, Enterprise Collaboration and Content Management, Enterprise Application Integration, and Business Intelligence & Data Warehousing. The company's core expertise lies in Application Modernization, utilizing Zensar's SBP framework. Zensar has established enduring partnerships with major clients such as Cisco, National Grid, Fujitsu, Marks and Spencer, Danaher Corporation, Electronic Arts, and Logitech. Additionally, it has formed strategic technology alliances with global leaders including IBM, Microsoft, Sun Microsystems, and Oracle.

Zensar Technologies possesses 13 registered patents, primarily falling under the 'Computing; Calculating' category, as reported by IPqwery. Furthermore, the company has registered 27 trademarks, with the most popular class being 'Scientific and technological services,' according to IPqwery.

TATA CONSULTANCY SERVICES

Established as a part of the prestigious Tata Group, Tata Consultancy Services Limited is a prominent name in the global IT services and consulting industry. With its headquarters in Mumbai, India, TCS operates across 46 countries, maintaining a strong presence in 150 locations worldwide. As a testament to its expansive scale, the company employs over 614,000 consultants globally and reported consolidated revenues of around US \$27.1 billion for the fiscal year ending March 31, 2023.

TCS provides a vast array of services, including but not limited to Cloud solutions, Cognitive Business Operations, Consulting, and Cybersecurity. The company boasts a significant market share in the United States, which accounts for 52% of its revenue, and Europe, contributing 32%. This global reach allows TCS to cater to a diverse and wide-ranging client base.

TCS's workforce includes more than 616,000 employees, reflecting the company's commitment to creating job opportunities and fostering a diverse work environment. This diversity is evident in its team, which includes individuals from 157 nationalities, and a significant representation of women, who make up 35.7% of the workforce.

With thousands of patents applied for and a substantial number granted, TCS underscores its commitment to technological advancement and market leadership. Its notable products like Cognix™, MFD™, and ignio™ have been instrumental in strengthening its position in the IT sector.

TCS remains a dominant force in the IT services industry, with its focus on innovation, a diverse and highly skilled workforce, and a comprehensive range of services. The company's strategic acquisitions and strong intellectual property portfolio position it well for continued growth and leadership in the technology sector.

INFOSYS

Established as a beacon in the IT sector, Infosys Limited, originating in Pune and now headquartered in Bangalore, India, distinguishes itself in business consulting, information technology, and outsourcing services. The company, recognized as India's second-largest IT company by revenue, reached a remarkable milestone of US \$ 17.7 billion for the fiscal year ending March 31, 2023. Infosys employs a significant workforce, with over 343,000 professionals as of 2023.

Infosys' portfolio encompasses a broad range of innovative products and services. These include an advanced AI platform, extensive management consulting services, transformative cloud solutions, an analytics platform, global banking solutions, cloud suites, and comprehensive engineering and digital marketing services. The company is also actively engaged in blockchain technology.

Emphasizing strategic expansion, Infosys has notably augmented its capabilities through acquisitions, including significant forays into digital marketing in Germany and life sciences technology consulting in Denmark in recent years.

The company has been lauded for its prowess in application modernization, data analytics, and agile software development, earning top rankings and recognitions from reputed organizations. Infosys' commitment to digital services in retail and consumer goods, along with its dedication to environmental sustainability, has also been globally acknowledged.

Maintaining a trajectory of growth and innovation, Infosys is positioned to continue its leadership role in the technology and consulting sectors, marked by its diverse service offerings and global footprint.

WIPRO

Wipro, an esteemed Indian multinational corporation, is at the forefront of the information technology, consulting, and business process services industries. Renowned as a Big Tech leader, Wipro offers an extensive range of services, including cloud computing, digital transformation, artificial intelligence, and data analytics, serving clients in 167 countries. For the year 2023, Wipro reported a revenue of approximately US\$11 billion. The company's global workforce, a testament to its scale, consists of around 240,000 employees.

Wipro's recent recognitions include winning the 'Best BPO' award at the 2023 CX Awards, highlighting its excellence in innovative outsourcing services. The company also earned the

German Partner of the Year- Runner-up Award 2023 from Microsoft, reflecting its outstanding achievements in Germany's IT service ecosystem in areas such as innovation, sustainability, and community engagement. Additionally, Wipro's collaboration with E.ON in cloud transformation and green energy initiatives, particularly in Data & AI technologies, is noteworthy.

Wipro's strategic expansion in 2021 included the acquisition of Capco, enhancing its presence in the financial services consultancy sector. In April 2022, Wipro further strengthened its consultancy services by acquiring Rizing Intermediate Holdings, a notable SAP consulting firm.

Moving forward, Wipro is poised to maintain its leadership in the IT services industry. The company's commitment to a broad spectrum of services, strategic acquisitions, and consistent innovation positions it for continued success and influence in the global technology landscape.

HCL Technologies

HCL Technologies Limited is a leading Indian multinational in the IT services and consulting sphere. Established by Shiv Nadar, HCLTech originated as an independent entity in 1991, branching into the software services sector. The company, with its headquarters in Noida, boasts a substantial global footprint with offices in 52 countries and a workforce exceeding 225,000 employees.

In 2023, HCLTech reported a notable revenue of US \$ 12.2 billion. HCLTech's market position is significant, being one of the top 20 largest publicly traded companies in India with a market capitalization of US \$ 40.5 billion as of Nov 2023, and it features on the Forbes Global 2000 list.

The company's commitment to workplace excellence is further highlighted by recognitions from Great Place to Work in the United States and its inclusion in Bloomberg's Gender-Equity Index for the second consecutive year. Demonstrating its dedication to diversity and inclusion, HCLTech is a founding member of the World Economic Forum's Global Parity Alliance on DE&I, which focuses on best practices for benefiting underrepresented groups.

Looking ahead, HCL Technologies is poised for sustained growth and innovation. The company is committed to leveraging cutting-edge technology to meet evolving customer needs, with a strong focus on areas like artificial intelligence, cloud computing, and cybersecurity. Its robust financial health and strategic acquisitions position HCL well to capitalize on new opportunities and maintain its leadership position in the technology sector.

TECH MAHINDRA

Tech Mahindra, founded in 1986, epitomizes the fusion of cutting-edge technology and business acumen. It offers a broad spectrum of services, such as IT consulting, digital transformation, engineering, and business process management, catering to a diverse range of industries. With over 158,000 employees spread across 90 countries, Tech Mahindra has carved a niche for itself as a prominent player in the global market. The fiscal year 2023 marked a period of substantial growth for Tech Mahindra, with its revenue reaching an impressive US \$ 6.4 billion.

Over the years, it has evolved into one of India's top IT firms, achieving a prominent position in the Big Tech sector of the country. By June 2022, the company had amassed a notable portfolio of 1,262 active clients, showcasing its extensive market reach and customer trust.

Its service offerings encompass infrastructure and cloud services, experience design services, business process services, network services, testing services, business excellence services, integrated engineering solutions, performance engineering, telecom product engineering, SAP, Oracle, enterprise of future, data analytics, artificial intelligence, cyber security, customer experience, digital supply chain, and intelligent automation.

In March 2021, Tech Mahindra partnered with the US-based business intelligence analytics company ThoughtSpot. In October 2022, the company acquired a 26% equity share in Upendra Singh Multi Transmission Private Limited, enhancing its solar energy capabilities for its Noida facilities. In 2023, Tech Mahindra collaborated with Anyverse to pioneer autonomous technology in the automobile sector. The company also organized the Global Chess League in 2023 in partnership with FIDE, featuring rapid chess.

Tech Mahindra's outlook appears promising, with ongoing investments in emerging technologies and a continuous expansion of its global footprint. The company's focus on digital transformation, coupled with its strategic partnerships and acquisitions, positions it well to address the evolving needs of various industries and maintain its growth trajectory.

LTI MINDTREE

LTIMindtree stands as a global technology consulting and digital solutions firm, empowering enterprises across diverse industries to rethink business models, expedite innovation, and optimize growth through the strategic utilization of digital technologies. Serving as a digital transformation partner to over 750 clients, LTIMindtree leverages extensive domain and technology expertise to foster superior competitive differentiation, enhance customer experiences, and drive impactful business outcomes in an increasingly interconnected world. Operating with the strength of nearly 90,000 skilled professionals spanning over 30 countries, LTIMindtree, a part of the Larsen & Toubro Group, seamlessly integrates the acclaimed capabilities of former Larsen and Toubro Infotech and Mindtree, delivering transformative solutions to address intricate business challenges at scale.

LTIMindtree's vision is to empower businesses for future success through the strategic utilization of cloud, data, and digital technologies. With its expanded capabilities and elevated market standing, LTIMindtree is positioned to catalyze transformative results and capitalize on the abundant opportunities within the IT industry.

Their approach is directed by the LTIMOne framework, emphasizing organizational unity and providing transparency to clients, employees, and stakeholders. This framework is structured around the principles of one culture, one GTM (Go-ToMarket) strategy, one unified capability, and one profitable growth model. Through these foundational elements, LTIMindtree aims to streamline operations, deliver meaningful outcomes, and foster profitable growth for their clients and the communities they serve.

MOURI Tech

MOURI Tech is a global enterprise IT solutions and services company, delivering a comprehensive portfolio of services with focus on end-to-end capabilities in intelligent enterprise resource planning (iERP) and enterprise digital transformation services. The company's operations are spread across four practice areas: iERP, enterprise digital transformation, infrastructure services and program management and others and with an extensive range of services and operations, the company stands out as one of the few companies capable of providing end-to-end IT solutions and services.

MOURI Tech has presence in USA, EMEA and India and also operates in South Africa, Germany, the United Kingdom, Canada and the UAE through its subsidiaries. As per Frost & Sullivan estimates, during CY2023, the USA, EMEA and India accounted for 37%, 30% and 4% of the overall technology spend, respectively.

MOURI Tech has developed strong offshore capabilities and a scalable business given the large pool of well trained and experienced engineers available in India allowing MOURI Tech to service customers overseas. The offshore business for the Indian IT services industry generally provides higher margins than onshore business since personnel costs are lower in India than in many other countries.

MOURI Tech is one of the youngest companies in India to achieve CMMI-Level 5 certification, which reflects their commitment to the quality and efficiency of their services. As of September 3rd, 2024, MOURI Tech had a Glassdoor rating of 3.6 on a scale of 1 - 5, being among one of the highest for Indian IT services companies. Companies engaged in the technology industry are required to provide a greater deal of employee satisfaction and morale through providing professional incentives and enable digital maturity through collaborative support from the workforce.

The company offers a comprehensive SAP portfolio to clients ranging from strategic advisory to full-scale implementation (which includes consulting, assessments, implementation, upgrade and migration) and support application management services, with an infusion of smart and intelligent analytics and AI at the business process level. The company's tailored SAP S/4HANA offerings, designed to meet each client's specific business requirement, supports a 'clean core' strategy that accelerates innovation and transformation. The company is also equipped to handle ebbs and flows in demand. Business process experts need to re-assess what improvements and benefits S/4 implementations can bring, functional experts need to configure S/4 and various technical teams must migrate interfaces, extensions and any other customer-specific content into the new Cloud-based paradigm. The company has maintained a strong client relationship over several years, providing the company with a unique ability to build upon and add new logos to a recurring client base. The trend of sustained long-term relationships and building on these relationships with its land and expand strategy has contributed to a thick layer of retained and growing revenue from their existing customers driven by Digital technologies and agile delivery methodology.

MOURI Tech has made a slew of acquisitions, aimed at strengthening its global presence, diversifying its product portfolio and adding to its technical expertise. While these acquisitions will drive operational synergies and cost efficiency, it also helps Mouri Tech create shareholder value by enhancing innovation capabilities and fostering long term growth and sustainability. Some of the companies acquired by Mouri Tech recently has been highlighted below –

- 1) Vertisystem, headquartered in Fremont, California, offers an array of services that include (i) cloud solutions; (ii) advanced analytics and business intelligence; (iii) application modernization and (iv) staffing solutions.
- 2) V3Tech Solutions Inc., offers a wide spectrum of human resource solutions, including customized temporary staffing and recruitment services to meet the specific needs of customers across multiple sectors, emphasizing flexibility and customization of workforce solutions.
- 3) TekGigz LLC, headquartered in Texas, USA offers services in staffing and technical consulting, focusing on recruiting skilled professionals and outsourcing them to customers across diverse industries.

Leading Service Providers Compared

Company	TCS	Infosys	Wipro	HCL	Tech Mahindra	LTI Mindtree
Headquarters	India	India	India	India	India	India
Market Cap (\$ BN) as of 3rd Sep 2024	196.7	97.1	33.8	58.5	19.4	21.9
Employees (March, 2024)	6,01,546	3,17,240	2,34,054	2,27,481	1,45,455	81,650
Attrition (FY24)	12.5%	12.6%	14.2%	12.4%	10.0%	14.4%
Financial Metrics						
Revenues (2021/22) (\$MN)	23103	14656	9556	10319	5379	1888
Revenues (2022/23) (\$MN)	27164	17683	10902	12224	6421	3998
Revenues (2023/24) (\$MN)	29023	18514	10814	13243	6265	4279
Revenue CAGR (2021/22-2023/24) (%)	12.08%	12.40%	6.38%	13.28%	7.92%	50.56%
Profit After Tax (PAT) (2021-22) (\$MN)	4632	2668	1474	1629	678	277
Profit After Tax (PAT) (2022-23) (\$MN)	5097	2905	1370	1789	589	531
Profit After Tax (PAT) (2023/24) (\$MN)	5554	3162	1342	1893	288	585
Profit After Tax CAGR (2021/22-2023/24) (%)	9.50%	8.87%	-4.61%	7.78%	-34.88%	45.33%
Profit Before Tax (PBT) (2021-22) (\$MN)	6227	3628	1824	2042	898	373
Profit Before Tax (PBT) (2022-23) (\$MN)	6856	4015	1780	2348	780	698
Profit Before Tax (PBT) (2023/24) (\$MN)	7470	4336	1776	2526	387	729
PBT CAGR (2021/22-2023/24) (%)	9.52%	9.33%	-1.30%	11.21%	-34.32%	39.74%
EBITDA (2021/22) (\$MN)	6877	4071	2258	2602	1100	425
EBITDA (2022/23) (\$MN)	7555	4558	2304	2890	1084	803
EBITDA (2023/24) (\$MN)	8164	4956	2338	3096	653	854
EBITDA CAGR (2021/22-2023/24) (%)	8.96%	10.34%	1.75%	9.07%	-22.94%	41.81%
Revenue / Employee (\$MN)	0.05	0.06	0.05	0.06	0.04	0.05
Net Worth (FY24) (\$MN)	11002	10658	8996	8225	3419	2413
Financial Ratios (%)						
PAT Margin (%) (FY24)	19.14%	17.08%	12.41%	14.29%	4.59%	13.67%
PBT Margin (%) (FY24)	25.74%	23.42%	16.43%	19.08%	6.18%	17.03%
EBIDTA Margin (%) (FY24)	28.13%	26.77%	21.62%	23.38%	10.43%	19.96%
ROCE (FY24)	68.7%	41.2%	18.0%	30.5%	12.1%	31.2%
ROE (FY24)	50.48%	29.67%	14.91%	23.01%	8.41%	24.24%

Company	Persistent Systems	Coforge	Happiest Minds	Birlasoft
Headquarters	India	India	India	India
Market Cap (\$ BN) as of 3rd Sep 2024	9.8	5.1	1.5	2.2
Employees	23,850	24,726	5,168	12,595
Attrition (FY24)	11.50%	11.5%	13.10%	12.4%
Financial Metrics				
Revenues (2021/22) (\$MN)	688	775	132	498
Revenues (2022/23) (\$MN)	1006	966	172	578
Revenues (2023/24) (\$MN)	1183	1106	196	636
Revenue CAGR (2021/22-2023/24) (%)	31.14%	19.46%	21.88%	13.04%
Profit After Tax (PAT) (2021-22) (\$MN)	83	86	22	56
Profit After Tax (PAT) (2022-23) (\$MN)	111	90	28	40
Profit After Tax (PAT) (2023/24) (\$MN)	132	101	30	75
Profit After Tax CAGR (2021/22-2023/24) (%)	25.85%	8.13%	17.08%	15.99%
Profit Before Tax (PBT) (2021-22) (\$MN)	111	104	30	74
Profit Before Tax (PBT) (2022-23) (\$MN)	153	115	38	53
Profit Before Tax (PBT) (2023/24) (\$MN)	174	126	39	101
PBT CAGR (2021/22-2023/24) (%)	25.15%	10.13%	12.82%	16.35%
EBITDA (2021/22) (\$MN)	133	139	36	85
EBITDA (2022/23) (\$MN)	192	155	46	65
EBITDA (2023/24) (\$MN)	217	179	51	113
EBITDA CAGR (2021/22-2023/24) (%)	27.93%	13.61%	19.54%	15.36%
Revenue / Employee (\$MN)	0.05	0.04	0.04	0.05
Net Worth (FY24) (\$MN)	597	449	178	367
Financial Ratios (%)				
PAT Margin (%) (FY24)	11.13%	9.10%	15.29%	11.82%
PBT Margin (%) (FY24)	14.74%	11.38%	19.74%	15.82%
EBIDTA Margin (%) (FY24)	18.36%	16.22%	25.93%	17.80%
ROCE (FY24)	28.9%	28.1%	18.9%	28.1%
ROE (FY24)	22.06%	22.42%	16.78%	20.49%

Company	Mphasis	Sonata	Zensar	Mouri Tech
Headquarters	India	India	India	United States
Market Cap (\$ BN) as of 3rd Sep 2024	7.1	2.3	2.2	NA
Employees	32,664	6,416	10,349	3,330 ¹
Attrition (FY24)	NA	14% (Q4FY24)	10.9%	12.97%
Financial Metrics				
Revenues (2021/22) (\$MN)	1441	669	511	100
Revenues (2022/23) (\$MN)	1662	897	584	133
Revenues (2023/24) (\$MN)	1600	1038	591	138
Revenue CAGR (2021/22-2023/24) (%)	5.36%	24.54%	7.47%	17.41%
Profit After Tax (PAT) (2021-22) (\$MN)	172	45	51	14
Profit After Tax (PAT) (2022-23) (\$MN)	197	54	39	19
Profit After Tax (PAT) (2023/24) (\$MN)	187	37	80	20
Profit After Tax CAGR (2021/22-2023/24) (%)	4.24%	-9.47%	25.58%	19.81%
Profit Before Tax (PBT) (2021-22) (\$MN)	230	60	69	19
Profit Before Tax (PBT) (2022-23) (\$MN)	262	72	54	26
Profit Before Tax (PBT) (2023/24) (\$MN)	249	77	106	27
PBT CAGR (2021/22-2023/24) (%)	3.98%	12.75%	23.51%	18.21%
EBITDA (2021/22) (\$MN)	274	68	96	22
EBITDA (2022/23) (\$MN)	313	81	79	29
EBITDA (2023/24) (\$MN)	318	103	124	31
EBITDA CAGR (2021/22-2023/24) (%)	7.65%	22.79%	13.91%	18.63%
Revenue / Employee (\$MN)	0.05	0.16	0.06	0.04
Net Worth (FY24) (\$MN)	1060	169	429	64
Financial Ratios (%)				
PAT Margin (%) (FY24)	11.71%	3.58%	13.57%	14.65%
PBT Margin (%) (FY24)	15.58%	7.38%	17.87%	19.59%
EBIDTA Margin (%) (FY24)	19.88%	9.90%	21.02%	22.36%
ROCE (FY24)	21.6%	34.7%	25.2%	39.26%
ROE (FY24)	17.68%	21.94%	18.67%	30.50%

Note:

1. Includes the employees assigned to a BPO project with the Andhra Pradesh government
2. Exchange Rates: 1 USD = 83 INR,
3. Attrition rates for TTM
4. ROE = Profit for the Year attributable to owners of the holding company / Total equity attributable to owners of the holding company
5. Source : Company annual reports, moneycontrol
6. EBITDA = Profit Before Tax (PBT) + Finance Charges + Dépréciation & Amortization

7. *Revenue / Employee = Total revenue / total employees*
8. *“Net worth” means the aggregate value of the paid-up share capital and all reserves created out of the profits and securities premium account and debit or credit balance of profit and loss account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, as per the audited balance sheet, but does not include reserves created out of revaluation of assets, write-back of depreciation and amalgamation.*
9. *Attrition relates to voluntary attrition for Fiscal 2024*
10. *Equity = Total shareholder's funds including reserves / surplus / premium / other comprehensive income and minority interest*
11. *Return on Capital Employed is calculated as EBIT (i.e restated profit/(loss) before tax plus finance costs) divided by capital employed (i.e aggregate of total equity and total borrowings)*

3.2 Threats and challenges to the Enterprise Information Technology Services industry

The industry faces several threats and challenges which can broadly be categorized into economic, technological, regulatory, and organizational factors.

Economic Challenges

1. **Global Economic Uncertainty:**
 - Economic downturns and instability can lead to reduced IT spending by businesses, affecting demand for IT services.
 - Fluctuations in currency exchange rates can impact profitability, especially for companies operating in multiple regions.
2. **Cost Pressures:**
 - Increasing operational costs, including rising salaries for skilled IT professionals and expenses related to technology infrastructure, can squeeze profit margins.
 - The need for constant investment in new technologies to stay competitive can be financially demanding

Technological Challenges

1. **Rapid Technological Advancements:**
 - The fast pace of technological change requires continuous learning and adaptation, making it challenging for service providers to stay ahead.
 - Companies must constantly update their offerings to incorporate emerging technologies such as artificial intelligence, blockchain, and quantum computing.
2. **Cybersecurity Threats:**
 - The increasing frequency and sophistication of cyberattacks pose a significant risk to IT service providers and their clients.
 - Maintaining robust cybersecurity measures is costly and requires ongoing investment in advanced security technologies and skilled personnel.
3. **Integration and Compatibility Issues:**
 - As businesses adopt a mix of legacy systems and new technologies, ensuring seamless integration and compatibility becomes a complex challenge.
 - Clients expect smooth implementation and integration of new solutions with existing systems, which can be technically demanding.

Regulatory Challenges

1. **Data Privacy and Compliance:**

- Stringent data privacy regulations, such as GDPR in Europe and CCPA in California, impose compliance requirements on IT service providers.
- Non-compliance can lead to significant fines and damage to reputation.

2. **Evolving Legal and Regulatory Landscape:**

- Changes in laws and regulations related to technology, cybersecurity, and data management can create uncertainty and require ongoing adjustments to services and practices.
- International regulations add complexity for companies operating across multiple jurisdictions.

Organizational Challenges

1. **Talent Acquisition and Retention:**

- There is a high demand for skilled IT professionals, and competition for top talent is intense.
- Retaining skilled employees is a challenge, as professionals seek career advancement opportunities and competitive compensation. In Fiscal 2022, there was a global trend known as the “great resignation”, mainly in America, where employees voluntarily resigned from their jobs in large numbers across sectors
- There is a limited pool of individuals who have the skills and training needed to help grow Companies, including a shortage of employees skilled in emerging technologies like artificial intelligence, machine learning, blockchain, Internet of Things, cybersecurity and data analytics.

2. **Managing Innovation:**

- Balancing the need for innovation with the need for stability and reliability in service delivery is a critical challenge.
- Encouraging a culture of innovation while maintaining efficient and effective service operations requires strong leadership and strategic vision.

Competitive Challenges

1. **Disruptive Business Models:**

- New business models and technological disruptions, such as cloud computing and as-a-service models, can challenge traditional service delivery methods.
- Companies must adapt their business strategies to accommodate these changes and meet evolving customer expectations.

Environmental and Social Challenges

1. **Sustainability and Environmental Impact:**

- Growing awareness of environmental issues is driving demand for sustainable IT practices and services.
- Companies are under pressure to reduce their carbon footprint and adopt green technologies, which can require significant investment.

2. **Social Responsibility and Ethical Concerns:**

- Ethical issues related to technology use, such as data privacy, AI ethics, and digital inclusion, are becoming increasingly important.

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- Companies must address these concerns proactively to maintain trust and avoid reputational damage.

Addressing these threats and challenges requires a proactive and strategic approach, involving continuous investment in technology, talent, and processes, as well as a strong focus on compliance, security, and innovation.