



## Emergence of IT sector in India and Gujarat

Rucha Naldurgakar<sup>1\*</sup>, Sonal Umesh Patil<sup>2</sup>, Jahanvi Sharma<sup>3</sup>  
L.J. Institute of Management Studies, LJ University

**Corresponding Author:** Rucha Naldurgakar [ruchanaldurgakar@ljk.edu.in](mailto:ruchanaldurgakar@ljk.edu.in)

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### ABSTRACT

After independence a new sector was born in India, The IT-ITeS industry, which stands for information technology and information services, has emerged as the cornerstone of contemporary India. Including hardware, software, and telecommunications, IT is a commercial area that deals with computing. India is regarded as the information hub and is the driving force behind the spread of information technology around the world. The Indian economy is dependent on IT sector, which contributes completely on the GDP (7.4% in financial year 2022, according to statista) and wellness of the country. As Gujarat is the major industrial state in India and also providing favorable business environment backed by several key principles of business copy (EODB) and business processes. In the global IT sector, the India has comparative advantage in term of cost. It can improve the productivity and efficiency in other industry.

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## INTRODUCTION

One of the biggest sectors in the world nowadays is that of information technology. The rest of the world views India as having the greatest proportion of internet users. In comparison to other significant emerging nations worldwide, India offers the cheapest costs for Internet access. (Table 1.1 represents the Internet cost charged in various nations from across the world). One of the nations that has adopted digitization most quickly is India. One of the industries in the Indian market that is expanding the quickest is IT.

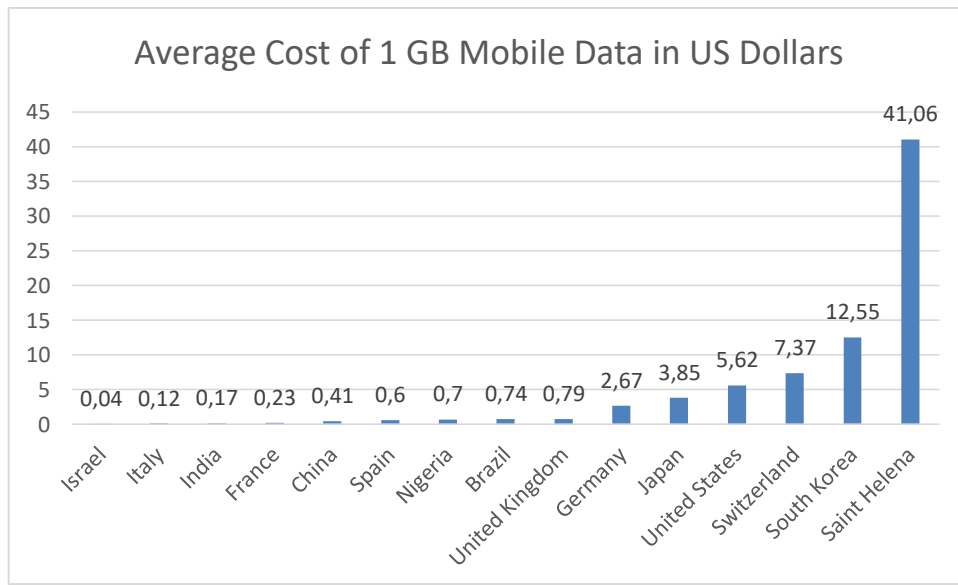


Figure 1. Average cost of 1 GB mobile data in US Dollars

Source: Cable.co.uk, average cost of 1 GB of Mobile data, in selected countries/territories, in 2022. Based on analysis of more than 5, 292 mobile data plans in 233 countries)

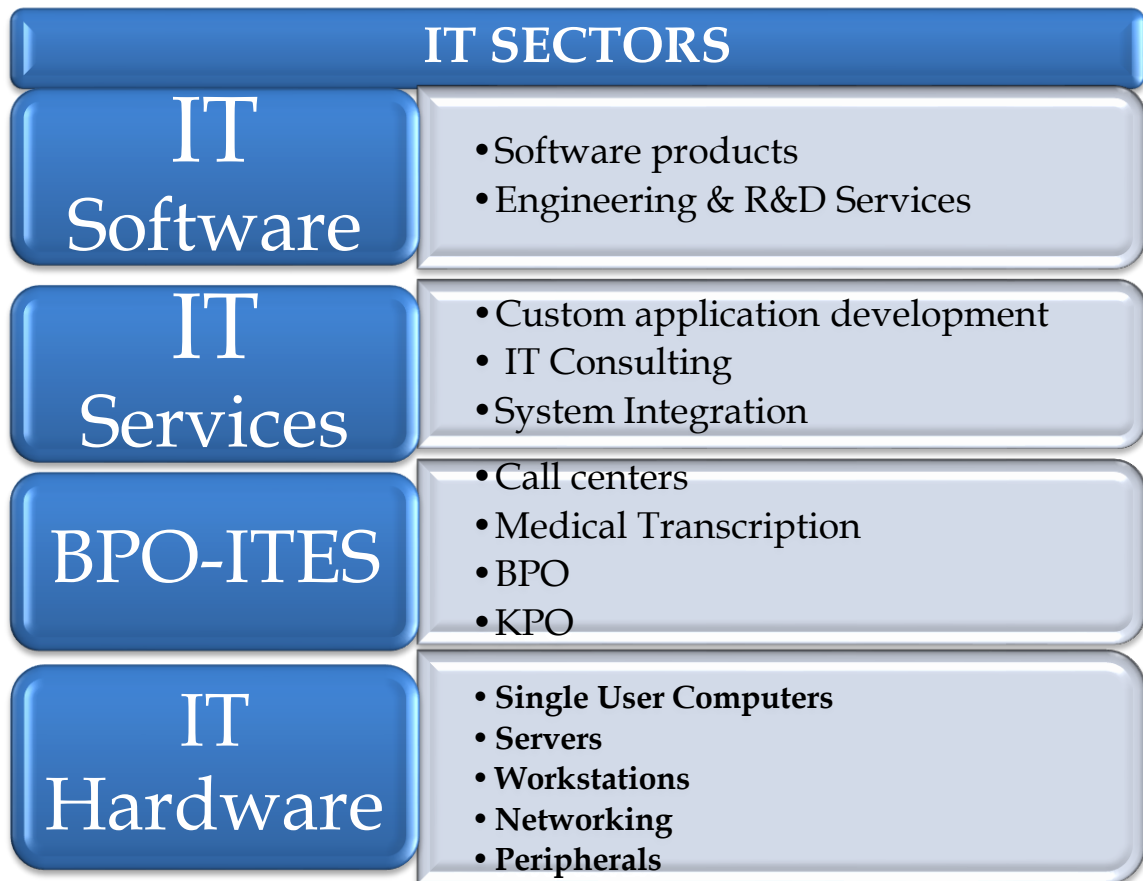
ITES-BPO, ITES-IT services and software, and ITES are the three divisions of the Indian IT industry. India is swiftly rising to the top of the list of preferred BPO outsourcing countries. Technology-related services, R&D, engineering, hardware, and BPO are all included in the IT and ITeS market. In a company or commercial setting, use computer and telecommunications equipment to store, transmit, store, and manage information. Indian IT companies have a network of international distributors. The BPM and IT industries are vertically diversified, including BFSI, telecom, and retail. Worldwide business competition has increased, especially for Information Technology Services (ITES). Large-scale employment creation, innovation encouragement, and environmental protection are all benefits of it. The IT industry is home to many professionals and experts and creates many career opportunities. This study focuses only on the IT software industry.

The main objectives of this study are:

- To analyze the emergence of IT industry in India
- To examine the growth of Gujarat by IT sector
- To understand the structure of Indian IT sector

There are four types of businesses in the IT sector. These are-

- IT Software
- IT Services
- BPO and ITES
- IT Hardware



In the areas of banking and finance, healthcare, and legal services, the Indian IT sector is expanding well. It is crucial for knowing how the Indian IT sector is organized and where it fits into the categories of IT hardware, IT software, and IT services.

The four IT-related enterprises are described below:

**1. IT services:**

The Indian IT sector includes a significant portion of IT services. Client, server, and web services are all part of IT. Opportunities abound in the IT services sector in fields like consulting, administration, Internet, and applications upkeep. The following customers use various types of IT services:

- Banking
- Government
- Manufacturing
- Financial services
- Retail and distribution

## **2. IT Services (BPO-ITES):**

The utilization of information and technology occurs frequently in various services. These services fall into the umbrella of IT-enabled services. The development of Indian IT industry is primarily attributed to the provision of IT services. The fastest-growing sector of India's ITES (information technology enabled service) market is business process outsourcing (BPO). The BPO sector in India has grown as a result of factors including economies of scale, decreased business risk, high profitability, greater usage, and superior talent. Beginning in the middle of the 1990s, BPO in India has expanded quickly. The ITES industry in India provides a number of important services, namely:

- Customer-interaction services including call-centers
- Back-office services
- Data entry and data conversion
- HR Services
- Content development and animation
- Remote education
- Data search
- Geographic Information Systems
- Market research

## **3. IT Software:**

The biggest export from India is software. The software sector in India began in the 1970s and has exploded in the past 10 years. The Indian software market increased more than fivefold during 1996–1997 and 2002–2003, from Rs. 26.3 billion to Rs. 132 billion. India's exports of software and services more than doubled throughout that time.

## **4. IT Hardware:**

Manufacturing and assembly of computer component is the primary emphasis of the hardware sector of the IT industry. The local market has a high level of computer product usage. The growth of IT companies has led to Sales of desktop computers, laptops, servers, routers, etc. The corporation has made investments in India's computer hardware market through a number of foreign organizations and nations.

## **THEORETICAL REVIEW**

In India, a rapidly expanding information technology sector is rising. When Tata Consultancy Service was founded in Mumbai in 1967, the IT sector officially had its start. Then, in 1977, they teamed up with Burroughs to start exporting IT services from India. Mumbai established its first export zone, SEEPZ, in 1973. More than 80 percent of the nation's software exports came from SEEPZ (Santacruz Electronics Export Processing Zone) in the 1980s, when the precursor to the contemporary IT Park was constructed. The task force then produced an IT road plan that included 108 proposals for improving India's technological situation as well as a background document. The enterprise

developed quickly due to the expertise and push of the state government, federal agencies, colleges, and software industry.

These strategies are based on the opinions and recommendations of international organizations such as World Bank, the International Telecommunication Union and the World Trade Organization (WTO). By creating a firm named Software Technology Park of India (STPI), which is under the control of the government without infringing its rights, the ministry of electronics dispelled this concern in 1991. Each of the software technology parks built by the STPI offers satellite links for usage by businesses; local links are radio links. In 1993, the government started to permit businesses to have their own connections, enabling operations in India to export directly to other nations.

## **METHODOLOGY**

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations. Quantitative research is the opposite of qualitative research, which involves collecting and analyzing non-numerical data (e.g., text, video, or audio). Quantitative research is widely used in the natural and social sciences: biology, chemistry, psychology, economics, sociology, marketing, etc.

## **RESULTS AND DISCUSSION**

### **a. Emergence of IT Sector in India**

In India, a rapidly expanding information technology sector is rising. When Tata Consultancy Service was founded in Mumbai in 1967, the IT sector officially had its start. Then, in 1977, they teamed up with Burroughs to start exporting IT services from India. Mumbai established its first export zone, SEEPZ, in 1973. More than 80 percent of the nation's software exports came from SEEPZ (Santacruz Electronics Export Processing Zone) in the 1980s, when the precursor to the contemporary IT Park was constructed. The task force then produced an IT road plan that included 108 proposals for improving India's technological situation as well as a background document. The enterprise developed quickly due to the expertise and push of the state government, federal agencies, colleges, and software industry.

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The EU-India collaborative group of scientists was then constituted on November 23, 2001, to support more development and research. On June 25, 2002, India and the European Union (EU) decided to collaborate bilaterally in research and technology. From 2017, when the India EU center for software training and development center will be located in Bangalore and India will become an associate member of CERN. Nowadays, start-ups across all industries in India are booming in the information technology sector. The cause is a number of start-up initiatives, including I-hub and the Start-up India program. The primary goal of doing this is to provide the funding necessary to help the innovative start-ups and businesses that are active in the Indian economy and are at the forefront of innovation in all fields.

As a result, the IT sector gained more popularity, which has the drawback that it is becoming harder for people to enter this flourishing area. Bangalore is the largest technology center in India and the world. Hyderabad, commonly known as HITEC city or Hyderabad, is the second-largest exporter of information technology and a significant global IT hub. Moreover, Chennai is also the third-largest exporter of business process outsourcing (BPO) services. The largest IT hubs are located in Delhi NCR, Kolkata, Pune, Kochi, and Kochi. The IT-ITES industry thus becomes one of the key pillars of contemporary India. India has been strengthening its position as the global center for innovation and technology over the past few years. This remarkable transition aids in the provision of expertise services that facilitate the faster growth of the Indian IT services sector.

Indian professionals are expected to handle the digital end-to-end activities of various nations and provide a solution to the issue. It will aid India's shift from a center for technology to a hybrid workforce driving the digital offerings of the biggest corporations in the world. India will move closer to the global intellectual center as a result of this process that circles the major commercial hub. A potential source of robots and artificial intelligence for the rest of the world, with many robots acting as engineers and providing customer service around-the-clock in a mixed-use setting. India's Business to Business (B2B) and Software-as-a-Service (SaaS) Ecosystems are forming for the platform and productization of IT services.

Following this, India experienced its first billion-dollar product company emerge, and the country's B2B and SaaS unicorn population has surpassed 20. Due to the Indian IT company's global delivery capabilities. The BPM and IT sectors are well-diversified across industries including BFSI, telecom, and retail. Prime Minister Narendra Modi has prioritized and supported to launch a business in the nation. Numerous IT start-up businesses in the fields of artificial intelligence, machine learning, the internet of things, and health care are supported by government initiatives.

#### **b. IT Sector Emergence in Gujarat**

Information technology (IT) services and business process outsourcing are the two main types of IT in India. In India the use of information technology at today has significantly altered the country's perception. All of the key

participants in the global IT business are focused in India, which is one of the largest IT cities in the world today. Gujarat boasts the most entrepreneurs, making it the most well-known state. India's IT sector is expanding quickly, thus it is seeking for new areas to expand. The states' emergence as India's second-fastest rising destination is supported by a number of factors.

Gujarat's capital city of Gandhinagar is home to the infocity IT Park. It is founded on the idea of a "city within a city," giving employees access to clubhouses, housing, and training facilities as well as a 24/7 work environment. Gujarat's Infocity is a hub for international IT outsourcing. TCS, paramount network solutions, cybage software, i-serve system, and Infosys are just a few of the IT firms with offices in Gandhinagar. Many other software parks and IT enterprises have been built in Gujarati cities including Ahmedabad, Surat, and Rajkot. Gujarat is expected to lead IT growth in the following ten years, according to NASSCOM. In addition to having more than 5000 small, medium, and big, high-performing ICT businesses, Gujarat is quickly establishing itself as a significant center for technological start-ups.

Gujarat has several cities with IT hubs, including Ahmedabad, Gandhinagar, Vadodara, and Surat. Gandhinagar's Software Technology Park was created to offer the value-added services needed for software development and export business. Gujarat, a significant industrial state in India, has received distinction on a national and worldwide level for its business climate, which is supported by a variety of innovation and the ease of doing business (EODB index, a ranking system). Gujarat missed the IT bus in the 1980s and again in the 2000s, so the government created a new strategy that offers unique incentives to encourage the hiring of more local IT and ITES expertise. The IT/ITES act 2022-27 primarily provides funding and support to Gujarati IT companies and pledges to generate 100,000 new direct jobs.

The policy would frequently support co-working spaces and develop several facets of the IT-ITES ecosystem in an effort to make Gujarat a "preferred place". In Gandhinagar, the top IT service and consulting company TCS built a green campus spanning over 25.5 acres of land.

### **c. About Robotics and Artificial Intelligence**

Today, robotics has developed into a key component of industrial operations. One of the most cutting-edge technologies in the digital age is robotics. It covers the creation, maintenance, use, and application of robots. There are many different kinds of robots, including humanoids, cooperative robots, and quadrupeds. These robots are frequently utilized in a variety of industries, including manufacturing, heavy industry, agriculture, aviation, hospitals, retail, dining, entertainment, and even households. The subject of robotics is still developing, with new advancements and ideas being made daily. Robotics as a subfield of engineering and computer science. The main purpose of the robotics industry is to create new, creative and intelligent machines that can help people in many ways and make their work easier and faster. A combination of computer programming and algorithms, actuators, a remotely controlled user, control system, processing, action, controlling, and

perception on robotics with real-time sensors, and automation components help inform the operation of robots or robots when it comes to working with robotics and handling robotics.

**d. Some Other Robotic Applications Included Are:**

Home appliances, vacuum cleaners and lawnmowers can be designed to operate profitably without disturbing people. In Homecare as well, some types of robots like Amazon Astro are included that common IT or energy use in the home or provide home security monitoring.

***Artificial intelligence (AI).***

- It is extensively utilized in robotics, artificial intelligence, and machine learning (ML) procedures, particularly in object recognition, tracking, natural language processing, and process automation.
- The study of data: Robots are used in the data science industry to carry out activities including data cleansing, automation, analysis, and invisible searches.
- The military and police: For their usage in surveillance and investigative operations, both the military and law enforcement heavily rely on robots.
- Robotics has also been employed to give soldiers on the battlefield more mobility.
- Engineering and mechanical industries: In manufacturing, robotics is frequently utilized for tasks like checking pipelines for corrosion and vetting dependability models.
- The mechanical UAV: Robotics aids in the development of driverless vehicles, robotic medical equipment, and smart factories.
- Nanotechnology: Micro electromechanical system fabrication, which produces compact integrated systems, frequently uses robotics.
- Biotechnology and health: Robots used in medicine and bioengineering include surgical robots, assistive robots, laboratory robots, and telemedicine robots.
- Drilling, painting, coating, inspecting, and repairing aero plane parts can all be done with robotics.

AI refers to intelligence that comes from technology or software rather than from people or other creatures. Advanced web searches, like Google Search, suggestions, speech recognition, car drivers (like Waymo), productive or creative tools (like ChatGPT and AI Art), and competitive play in classic games like Chess and Go are all made possible by AI applications. In order to solve problems, artificial intelligence (AI) relies on the mix of computer science and large data collections. It also includes the machine learning and deep learning, which often refer are to artificial intelligence. These areas involve creating experts who use artificial intelligence algorithms to make predictions or classify information based on input data.

The hype around artificial intelligence has gone through many iterations over the years, but even sceptics agree that the launch of OpenAI's ChatGPT marks a turning point. The breakthrough in computer vision occurred while

generative AI was important previously, but the advancement in natural language processing occurs presently. The design model can also understand the grammar of software code, chemicals, natural imagery, and many other types of materials, so it's not only limited to language.

**e. Informational Technology Education in India:**

The effect of emerging the IT Education institutes in India, has also played an important role in overall growth in the IT sector. The increasing number of IT institutes, is educating good IT professionals in India, every year. That has helped the Foreign Direct investors to get efficient workforce in an inexpensive rate.

Table 2. Provides the number of institutes in India that are contributing this dynamic sector

COLLEGES	No. OF COLLEGES
INDIA	43,796

<i>IT colleges</i>	<i>No of Colleges</i>	<i>Private</i>	<i>Government</i>	<i>Public private</i>
<i>India</i>	<b>2145</b>	<b>1664</b>	<b>373</b>	<b>40</b>
<i>Gujarat</i>	<b>143</b>	<b>11</b>	<b>26</b>	<b>1</b>
<i>Ahmedabad</i>	<b>27</b>	-	-	-

In terms of the global higher education network, India has one of the biggest education systems in the world, ranking second. After completing 10 years of elementary education and 2 years of secondary education, what is known as "higher education" or "tertiary level education" is completed in India. In addition to the 43,796 colleges in India, three more universities in India: the Indian institutes of technology (IIT), the Indian Institutes of Science (IISc), the National Institutes of Technology (NIT), the Indian Institutes of Science Education and Research (IISER), and the Indian Institutes of Management (IIMs) are quietly appearing in the list of the top universities in the world.

The number of colleges has climbed by 1453, while the number of universities has increased by 70 over the course of 2020–21. There are 2145 colleges in India that provide students an IT education. In India, there are numerous institutions of information technology. There are 143 colleges in Gujarat, and there are 27 information technology colleges in Ahmedabad. India offers a wide range of specializations in IT. The colleges are divided into three categories: private, public (government-run), and private (public). Public colleges are also known as government colleges since they are funded by the government yet are independent private universities with their own policies and investors.

To sum up, considering the growth of IT sector in Artificial Intelligence and Machine Learning, Open AI and Robotics, in Gujarat can become the next IT Hub of India in coming years. It is evident that as the number of institutes increase, the employment opportunities shall also take at next level.

## CONCLUSIONS AND RECOMMENDATIONS

After independence a new sector was born in India, The IT-ITeS industry, which stands for information technology and information services, has emerged as the cornerstone of contemporary India. Including hardware, software, and telecommunications, IT is a commercial area that deals with computing. India is regarded as the information hub and is the driving force behind the spread of information technology around the world. The Indian economy is dependent on IT sector, which contributes completely on the GDP (7.4% in financial year 2022, according to statista) and wellness of the country. As Gujarat is the major industrial state in India and also providing favorable business environment backed by several key principles of business copy (EODB) and business processes. In the global IT sector, the India has comparative advantage in term of cost. It can improve the productivity and efficiency in other industry.

## FURTHER STUDY

This study is aim to support the Emergence of IT sector in India and Gujarat. Hopefully it will useful for the reader and if there another researcher used this research for the next research, be objective.

## REFERENCE

- Bruff, Derek. 2009. *Teaching with Classroom Response Systems: Creating Active Learning Environments* Jossey-Bass Publishers, San Francisco.
- Couch, Catherine, Adam P. Fagen, J. Paul Callan, and Eric Mazur, 2004. "Classroom demonstrations: Learning tools or entertainment?" *American Journal of Physics*. Volume 72, Issue 6, pp. 835-838.
- Graff, Gerald and Cathy Birkenstein, 2009. *They Say / I Say: The Moves That Matter in Academic Writing* (Second Edition) WW Norton.
- Liew, Chong-Wah and Treagust, D.F. 1998. The Effectiveness of Predict-Observe-Explain Tasks in Diagnosing Students' Understanding of Science and in Identifying Their Levels of Achievement. Paper presented at Annual Meeting of the American Educational Research Association (San Diego, CA, April 13 - 17)
- Loverude, M.E. 2009. A research-based interactive lecture demonstration on sinking and floating *American Journal of Physics*, Volume 77, Issue 10, pp. 897-901.
- Mestre, Jose 2005 *Transfer of Learning from a Modern Multidisciplinary Perspective*. Information Age Publishing, Greenwich, CT.
- Simconblog. (2016, October 3). Information Technology Industry of Gujarat. Anuj Kumar Sirohi. <https://ingujarat.in/information/it-industry-of-gujarat/>