Opportunities in Indian Remote Sensing Industry

With emerging, advanced technology, the role and significance of geospatial science is set to grow manifold with many countries foraging into the Geographical Information System (GIS) and Remote Sensing (RS) area. In India, accelerated growth and development have induced industries and businesses to explore the use of GIS, RS and the Global Positioning System (GPS). These tools and techniques have wide application in agriculture, transportation. forestry, weather forecasting, land-use mapping, and irrigation among others.

The global Remote Sensing Services market is expected to reach USD 26.6 billion in 2027, growing at a CAGR of 14.9%

The RS services are crucial in gathering and analyzing information at remote locations using satellites, airborne vehicles, and on-ground vehicles. They provide vital information necessary for system upgrades of turnkey solutions. RS solutions have diverse applications like in mapping of water bodies, soil moisture mapping, surface movements, land cover and land use maps, mineral resources, urban and rural development, disaster management support and in mitigation of climate change. Organizations operating in the RS services market are involved in the commercial exploration of space products, transfer of technology, technical consultancy, and facilitating space-related industrial capabilities.

To boost the deployment and utilization of geospatial technology, the government has eased accessibility norms of satellite-based RS data. It is no longer required to obtain a license or approval for collecting, generating, storing or distributing geospatial data. This in turn has led to increased utilization of low-cost geospatial data facilitating the development of downstream data.

Service providers will be permitted to provide RS data and services to any users in the country after a simple registration process. By enabling easy dissemination of RS data and services from space-based systems, a new era exploiting the unlimited potential of RS data /services had begun. Reflecting the global trends, the new policy facilitates Indian industries everywhere to engage in space based remote sensing activities. The new policy with simplified procedures is aimed at enhanced and effective participation of Indian industry.

Factors that drive the utilization of remote sensing data include developments in remote sensing technologies, rise in adoption of GIS applications, and increasing demand of RS data in defense. The recent developments in home automation, smart cities and smart environments, together with sensor networks created the Internet of Things (IOT). The RS data combined with IOT technologies can offer a wide range of benefits while facilitating newer possibilities like cost reduction, alerting problems in advance, and system performance improvement. Thanks to big data analytics, the application of RS data has huge benefits in the areas of urban planning, monitoring of natural hazards, and mitigation of global climate change.

The market for geospatial data in India is projected to reach USD 12 billion by 2030. The government has initiated several policy adjustments to safeguard and develop the Indian geospatial ecosystem. Speaking at the second United Nations World Geospatial Information Congress (UN-WGIC), Union Minister Mr. Jitendra Singh said that India's geospatial economy would exceed Rs. 65,000 crores by 2025. Growing at a rate of 12.8%, Indian geospatial economy would employ around 10 lakh people mainly by startups. With over 250 geospatial startups in the
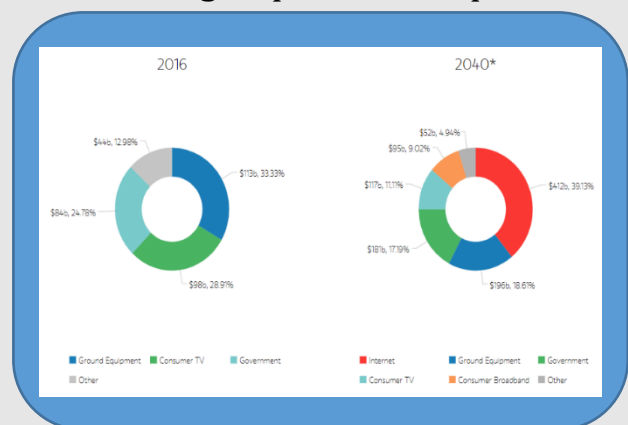
country, the government has embarked on geospatial incubators. The impact of geospatial data and technologies will have a manifold impact on the productivity and efficiency across diverse sectors, contributing to the socio-economic development of the country.

A major challenge in utilizing geospatial data is its integration with enterprise solutions of SMEs like CRM and ERP. Although the geospatial business and application scope has expanded, high costs of GIS solutions and geographical data barriers are some growth limiting factors. The geospatial data offered in many incompatible formats require data translators for adoption which raises data conversion and integration costs, therefore GIS implementation costs. Solution providers require trained staff to deliver client-specific solutions given their varied tools and processes. Lack of experienced staff and the limited number of specialized professionals is a major drawback faced by geospatial analytics solution providers.

Given the increased adoption of geospatial technologies across major areas, the scope of job opportunities in GIS and RS has opened up dramatically. Although we lack a skilled workforce, this issue has now been largely addressed with several institutes starting graduate and post graduate level courses in GIS and RS. The RS and GIS professionals have a wide range of distinct roles like GIS mapping technicians and data specialists, GIS business analyst, GIS consultants, programmers, GIS and Geospatial Software Engineers, GIS programmers and technical assistants. The website of the government's Indian Institute of Remote Sensing provides information on academic programs including distance learning, research and employment that can be accessed at http://www.iirs.gov.in

Application of Geospatial Information

The global remote sensing service provider market is dominated by established players including Maxar Technologies, ICEYE, SI Imaging Services, Airbus, Lockheed Martin Corporation, DMC International Imaging, Planet Labs PBC, Geo Sense, Hexagon AB, and Sobloo. Some of the prominent companies using remote sensing are tech giants like Apple, Microsoft, and Alphabet, insurance companies like
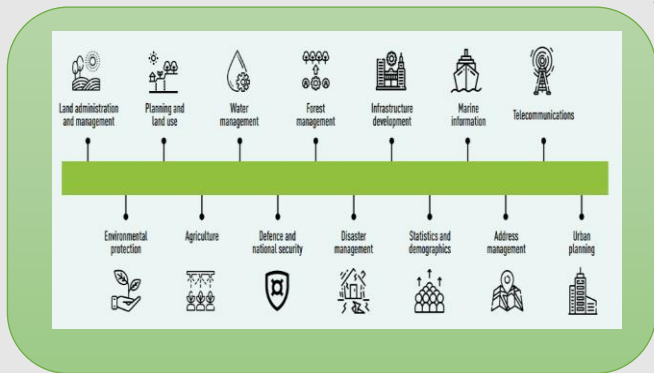
UnitedHealth Group, Anthem, Express Scripts Holding, telecommunications companies like AT&T and Verizon and online retail giant Amazon. Among the prominent Indian service providers are Seermaps Technologies (OPC) Pvt. Ltd, Eagletronics Aviation Private Limited, Genesys, Brainfuel Solutions, ESRI India, NAAGAR GeoInfo Services (NGIS), SpatioZest Private Limited, Rolta, and Axis Geomatiques. Remote sensing users in India include players from varied domain These include Infosys, TCS, Accenture, Indian Railways, Indian Meteorological Department, TTK Maps, Ola, Uber, Reliance General Insurance, and RMSI Cropalytics among others.

For **India to accomplish its vision of becoming a USD 5 trillion economy by 2024,** it is important to leverage the digital transformation by developing digital and spatial data infrastructure. India needs an integrated National Geospatial strategy wherein an integrated geospatial infrastructure is created to support our national aspirations through synergy between the various agencies and stakeholders. The need for complex GIS software development to facilitate standard or customized real-time data collection is another big opportunity

for Indian IT solution providers to develop standard or customized products for the global geospatial analytics market.

Space Industry Market Place

The growing partnerships between the various international space institutions to integrate technology and investments, and the expanding space and R&D initiatives have enabled growth of the global spacecraft market.

Morgan Stanley's space tram has estimated the global space industry to generate *over USD 1 trillion in revenue by 2040, up from USD 350 billion at present.* Like with reusable rockets that help to scale down costs, mass production of satellites and the development of satellite technology too would drive down costs.

The satellite launch costs have come down from USD 200 million to USD 60 million now. With reusable rockets, there is potential for launch costs to drop to even USD 5 million. According to Morgan Stanley, satellite mass production can reduce the cost of producing a satellite from USD 500 million to just USD 500,000.

The Global Space Economy ($t)

2029e
- Consumer TV: 100 914
- Consumer Radio: 8 351
- Consumer Broadband: 41 962
- Fixed Satellite Services: 18 330
- Mobile Satellite Services: 10 666
- Earth Observation Services: 7 410
- Ground Equipment: 175 228
- Satellite Manufacturing: 18 529
- Satellite Launch: 9 901
- Non Satellite Industry: 95 262
- Second Order Impacts: 75 917

Legend:
- Consumer TV
- Consumer Broadband
- Fixed Satellite Services
- Mobile Satellite Services
- Earth Observation Services
- Ground Equipment
- Satellite Manufacturing
- Satellite Launch
- Non Satellite Industry
- Second Order Impacts