Space+Spatial Value Chain

Space+Spatial Analytics Empowering Businesses
Enabling multiple businesses across sectors and countries to Rise™ ...

<table>
<thead>
<tr>
<th>People</th>
<th>Industries</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>260K</td>
<td>22</td>
<td>100+</td>
</tr>
<tr>
<td>150+ Companies</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

- Aerospace
- Aftermarket
- Agri Industry
- Automotive
- Boats
- Clean Energy
- Housing Finance
- Vehicle Finance
- Construction Equipment
- Consulting
- Defence
- Farm Equipment
- Hospitality
- Information Technology
- Two Wheelers
- Insurance Broking
- Logistics
- Power Backup
- Real Estate & Infra
- Retail
- Steel
- Trucks & Buses
Tech Mahindra

6 BN + Revenue
145K+ People
1100+ Global Customers
90+ Country

Leaders in ESG

8 Of Top 10 In Automotive
8 Of Top 10 In Life Science
2 Of Top 5 In Hardware And Storage
6 Of Top 10 In Communications Services
6 Of Top 10 In Healthcare Equipment
2 Of Top 10 In Insurance
5 Of Top 10 In Conglomerates
5 Of Top 10 In Consumer Goods
2 Of Top 10 In Process Manufacturing
4 Of Top 10 In Oil And Gas

We are ...
SPACE LAUNCH / TECH / EO MARKET


By End-use

- Defense
- Urban Development and Cultural Heritage
- Agriculture
- Climate Services
- Energy and Raw Materials
- Infrastructure
- Others

By Product Type

- EO Data
- Value-added Services

Space Launch Service

- Market Value 2022 – USD 14.21 Billion
- Expected growth – 12.25% CAGR
- Expected value in 2029 – USD 31.90 Billion
- Courtesy --- Fortune Business Insights

Earth observation satellites

- Market Value 2021 – USD 5.7 Billion
- Expected growth – 7.2% CAGR
- Expected value in 2031 – USD 11.3 Billion
- Courtesy --- Allied Market Research

Space Technology

- Market Value 2022 – USD 520 Billion
- Expected growth – 6.7% CAGR
- Expected value in 2030 – USD 875 Billion
- Courtesy --- Market Research Future

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Future Space+spatial Analytics Ecosystem

Satellite data (Positionally accurate & Real-time) → Data digitization (AI/ML) → Analytics engine (BIG EARTH DATA ANALYTICS) → Spatial analytics dashboards

Very limited manual intervention
Space+spatial Value Chain/key Sectors

- LAND ADMINISTRATION
- ENVIRONMENT AND CLIMATE CHANGE
- AGRICULTURE AND FOOD SECURITY
- ENERGY
- DISASTER AND RISK MANAGEMENT
- WATER RESOURCE MANAGEMENT & IRRIGATION
Land Administration

• Tracking of land allotments
• Possessions identification
• Timely resolution of land acquisition issues
• Location of property
• Ownership of property
• Size and shape of each land parcel
• Trends in rents and prices
• Eliminate errors in data and parcel boundaries
• Automatic change detections
Agriculture and Food Security

- Precision irrigation
- Plant disease identification
- Monitor fields, water supplies, temperature fluctuations
- Analyse crop varieties, field boundaries, irrigation systems
- Real-time measurement of crop production and quality
- Visualize soil moisture levels
- Track animal movements in animal husbandry
- Monitor health, growth, fertility and nutrition of livestock
Disaster and Risk Management

• Preparedness for disaster
• Planning & Mitigation
• Response and recovery
• Building a common operating environment
• Providing live data
Environment and Climate Change

- Observe the distribution of forests
- Map the population of different species
- Track the animals and plants to monitor their growth
- Monitor and predict wildlife movements
- Monitor the progress/status of conservation efforts
Energy Sector

- Identify right wind and solar energy sites
- Oil, gas and mineral exploration
Water Resource Management & Irrigation

- Water flow modeling
- Flood management
- Ground water level assessment
- Water quality assessment
- Monitor changes in stream channels
Realtime GIS – Major Pipeline ORG in USA

**Project needs**

- Need to have a map integrated operations dashboard
- Integration with SCADA and other real-time systems data onto GIS
- Need to analyze and visualize business data on dashboard for better business decisions and tracking
- Intuitive map interface for better user adoptability

**Benefits to customer**

- Integrated view of real-time transmission data overlaid with outages, one call, weather etc.
- Realtime operations dashboards
- Increased accuracy of data pooling and charting
- Configurable dashboard based on user groups, business units
- Integral view of service calls and weather data for scheduling of tickets

**Project details**

- Developed integration framework using ESRI ArcGIS Server
- Implemented UPDM with Utility Network
- Integrated SCADA data in near real-time and generated dashboards – using charts, gauges, lists and graphs
- Integrated Outages, Service KPIs, One Call locations
- Developed a configurable GIS dashboard
## Evacuation Application for an Oil&gas Major

### Project Needs

- Oil & Gas giant’s assets need to be accessed by their employees across the globe based on their privilege to view, query and analyze.
- To protect the assets and for an evacuation process, predictive and impact analysis of Disaster Management Module (DMM) like Hurricanes, Earthquakes and Oil spill were the requirements.

### Project Details

- The Mapping application is developed using:
  - C# .NET & WCF
  - ArcGIS Server with Spatial Analyst
  - ArcGIS Server Javascript API, Angular JS
  - Oracle 11g

### Benefits To Customer

- Information related to Wells, production, facilities, operations, seismic, marine, pipelines, leases, etc. can be visualized at single web GIS space.
- Disaster Analysis gives predictive report and provides required information in short duration for evacuation to save human lives and valuable assets.
- Maps exposed as services like WMS, KML and GeoRSS services.
### Project Needs

- Monitoring of water levels at realtime
- Provide a web application for citizen use
- Generate automatic alerts if water level reaches to threshold levels
- Integrate CC cameras to the application

### Benefits To Customer

- Realtime information available on dashboard
- Citizens can receive alerts instantaneously
- Reduced time to take effective decisions in case of flash floods
- Citizens can see the history of events from the same application

### Project Details

- Developed a GIS based dashboard application using ESRI ArcGIS
- Integrated realtime data captured from water level sensors
- Integration with OneMap GIS platform for base map visualization instead of Google Maps
- Integrated GIS to messaging system to generate Alerts
Public Utilities Board (Pub), Singapore

**Project needs**

- Monitor air quality in Abu Dhabi, tracking the movement of birds using satellite telemetry
- Collect and analyze air quality data from various air quality sensors and bird tracking system implemented to automate the tracking information
- Visualization and study of birds migratory path using HTML animation

**Benefits to customer**

- Reduced dependencies in data sharing/data processing by automation of different data sources to Enterprise GIS
- Dynamic Visual Representation in WebGIS Application
- Improve GIS system availability and stability
- Improve utilization of systems resources
- Maintain and evolve a coordinated approach to GIS
- Dashboard to monitor and quick decision making

**Project details**

- Developed Outlook Extension to read the mail attachments
- Implemented system to use GeoEvent Server capabilities to read and store in the Enterprise Geodatabase to make them available to GIS applications
- Developed WebGIS Application using ESRI WebApp Builder and Created Custom Widgets to Project Specific Requirements
- Apart from telemetry, the application also has functionalities like geofensing of protected area, hot spots and heat maps. It also enable users to visualize tracking of data time series wise.
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