TECH
mahindra

Space+Spatial Value Chain

Space+Spatial Analytics Empowering Businesses

Space+Spatial Analytics Empowering Businesses

Enabling multiple businesses across sectors and countries to Rise™ …

Mahindra & Mahindra

260K People | **22** Industries | **100+** Countries
150+ Companies | **11** Sectors |

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

Tech Mahindra

6 BN + Revenue   **1100+** Global Customers   **Leaders** in ESG

145K+ People   **90+** Country

We are …

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

4

SPACE LAUNCH / TECH / EO MARKET

Satellite-Based Earth Observation Market by Product Type (EO Data, Value-Added Services), by Satellite Orbit (Low Earth Orbit, Medium Earth Orbit, Geostationary orbit), by End-use (Defense, Urban Development and Cultural Heritage, Agriculture, Climate Services, Energy and Raw Materials, Infrastructure, Others): Global Opportunity Analysis and Industry Forecast, 2021-2031.

By End-use — 2021, 2031

Defense, Urban Development And Cultural Heritage, Agriculture, Climate Services, Energy And Raw Materials, Infrastructure, Others

By Product Type — 2021, 2031

Eo Data, Value-added Services
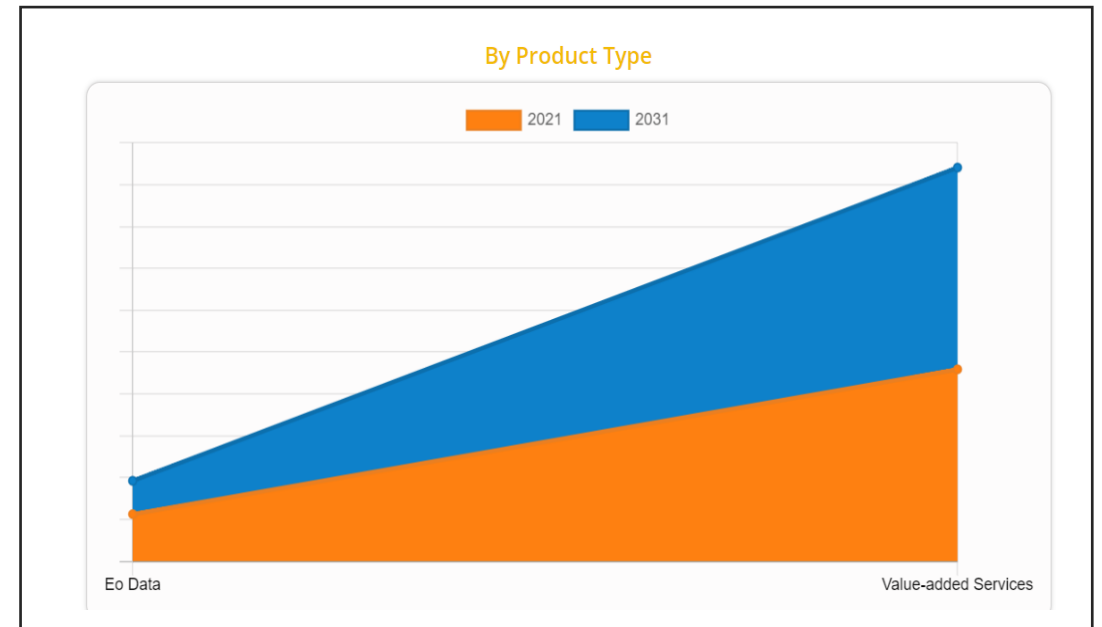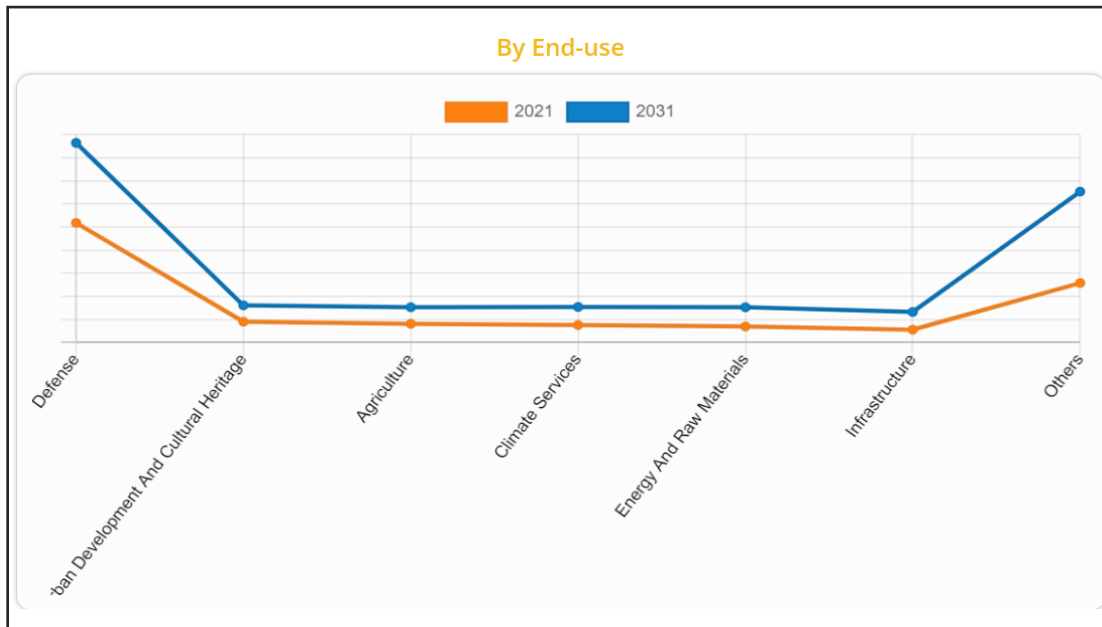
Space Launch Service

- 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

Future Space+spatial Analytics Ecosystem
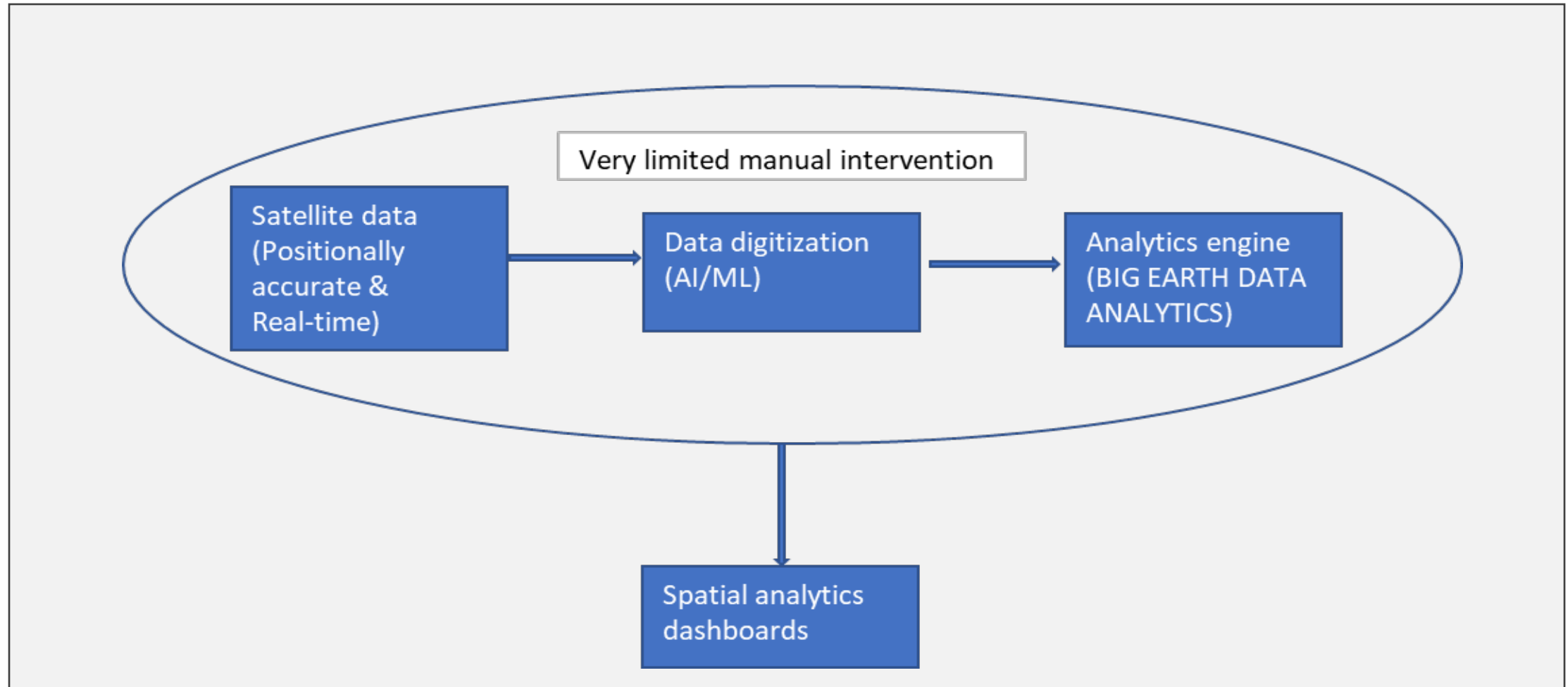
Space+spatial Value Chain/key Sectors

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

Project details

- Developed integration framework using ESRI ArcGIS Server

- Implemented UPDM with Utility Network

- Integrated SCADA data in near realtime and generated dashboards – using charts, gauges, lists and graphs

- Integrated Outages, Service KPIs, One Call locations

- Developed a configurable GIS dashboard

Benefits to customer

- Integrated view of realtime 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
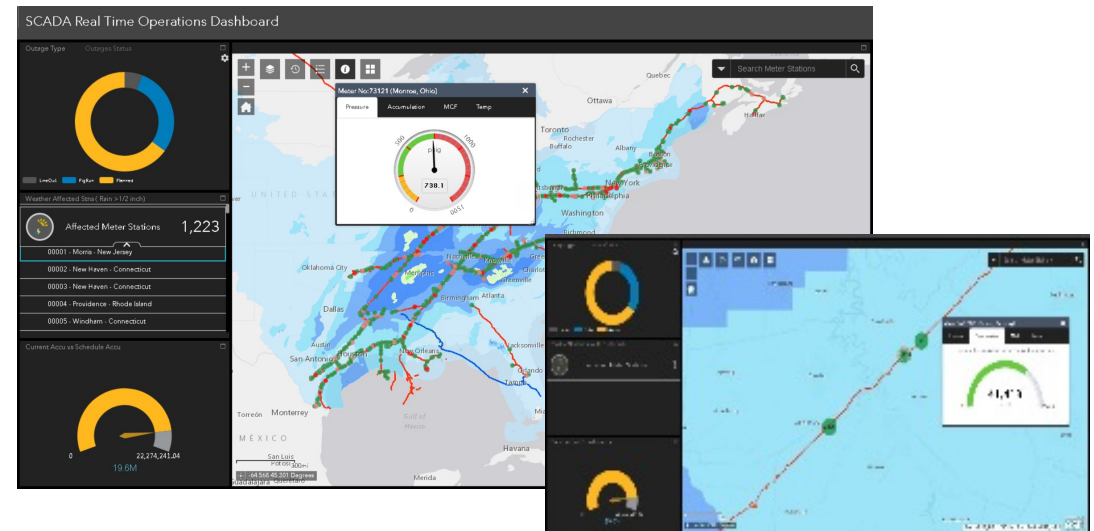
Evacuation Application for an Oil&gas Major
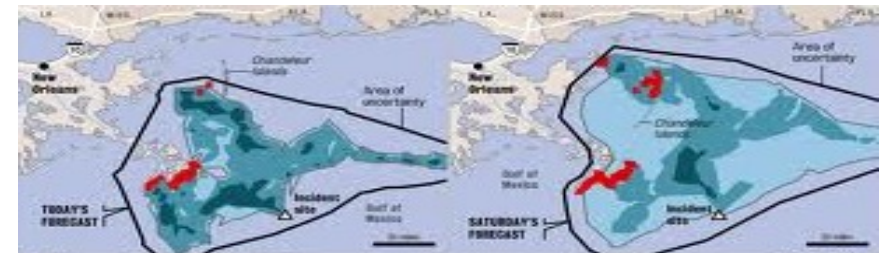
Integration

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

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 Details

- The Mapping application is developed using:

- C# .NET & WCF

  ArcGIS Server with Spatial Analyst

  ArcGIS Server Javacript API, Angular JS

  Oracle 11g

Public Utilities Board (Pub), Singapore

GIS Integration

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

End to End
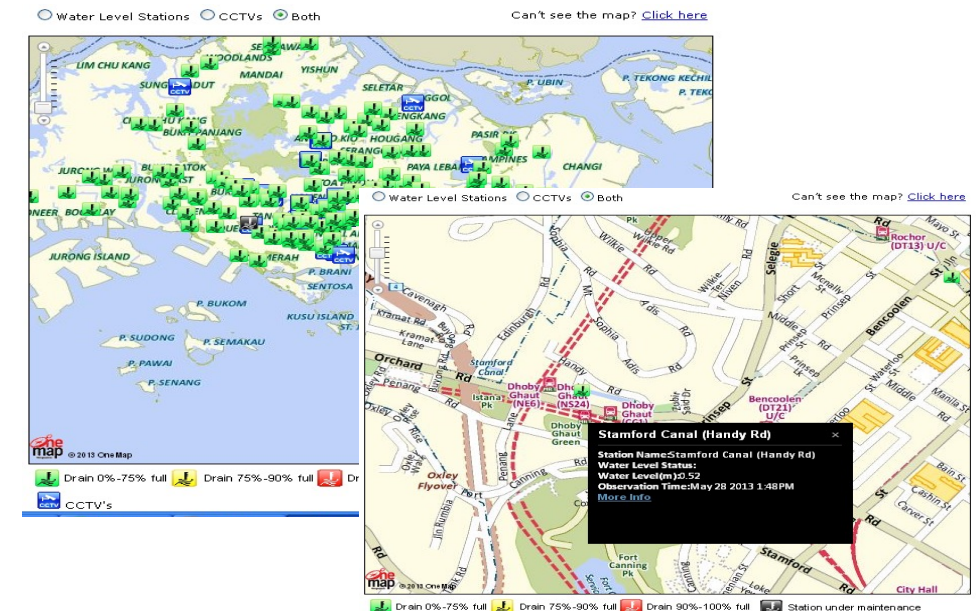
Project needs

- 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 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 aread, hot spots and heat maps. It also enable users to visualize tracking of data time series wise.

17

Thank You

Disclaimer