



Geospatial & Hexagon

Emerging Geospatial Technology Trends

Middle East Geospatial Forum
February 16, 2015
Dubai. U.A.E.

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Hexagon Geospatial

Market Trends – Technology

1. **Proliferation of point cloud elevation data.** \$5M USGS LiDAR Collection and Management program.
2. **Emergence of low-cost, high-fidelity micro-satellites** (Planet Labs, SkyBox Imaging, Urthcast) orbiting the earth with a high frequency return rate to monitor change.
3. **Increased emphasis on 3D for Analytics** – not just visualization.
4. **Adoption of UAS for local mapping initiatives** in Mining, Agriculture, Forestry, Engineering Works.
5. Higher adoption of **light weight ‘purpose built’ mobile and web apps coupled with content.** Increasing adoption of crowd sourced data and ‘Spatial – Social Networks’ supporting the ‘Human Sensor’ concept.
6. **Fusion of airborne + terrestrial data** for asset inventory/management.
7. **Wider adoption of integrated Business Intelligence (BI) and Geospatial technology**

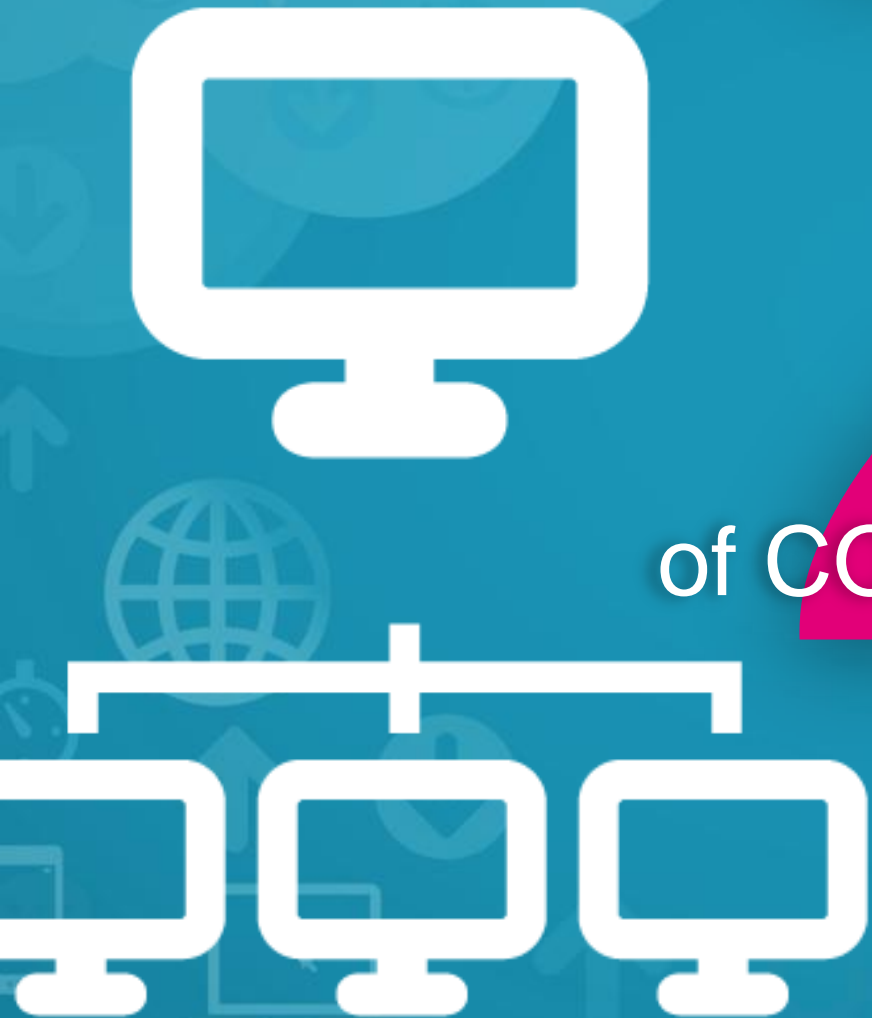
Market Trends - Business

1. Satellite data providers selling information **subscriptions**
2. Google and Microsoft now selling geospatial data and platforms with simple GIS functionality.
3. Shift away **from perpetual licenses** and **towards monthly subscription pricing**.
4. Open data initiatives by Western Governments and/or INSPIRE initiative in the EU.
5. **Cost of cloud storage and computing decreasing.**
6. Emerging markets leapfrogging desktop solutions and expanding directly with web and mobile solutions.
7. Ongoing privacy/security concerns with cloud based solution deployments

> 1
billion

tablet in use
in 2017

(40% in EMEA)



2 Billions
of CONNECTED SENSORS
in 2020

...that will generate

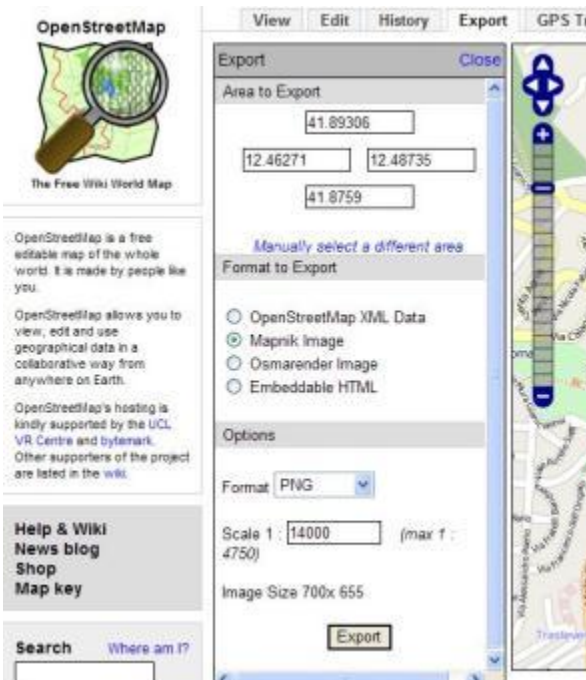
2.5 EXABYTES

or ,500,000,000,000,000,000 bytes

└ QUINTILLION └ QUADRILLION └ TRILLION └ BILLION └ MILLION └ THOUSAND

every day

Neogeography and VGI (Volunteered Geographic Information)



OpenStreetMap
The Free Wiki World Map

OpenStreetMap is a free editable map of the whole world. It is made by people like you.

OpenStreetMap allows you to view, edit and use geographical data in a collaborative way from anywhere on Earth.

OpenStreetMap's hosting is kindly supported by the UCL VR Centre and bytemark. Other supporters of the project are listed in the wiki.

Help & Wiki
News blog
Shop
Map key

Search Where am I?

Export Close

Area to Export

[Manually select a different area](#)

Format to Export

☐ OpenStreetMap XML Data
☒ Mapnik Image
☐ Osmarender Image
☐ Embeddable HTML

Options

Format:

Scale 1: (max 1: 4750)

Image Size 700x 655





- WikiMapia
- OpenStreetMap
- Neogeography
- Public Participation GIS
- Geo-social networking
- Geoblog
- Participatory GIS
- Participatory 3D Modelling (P3DM)



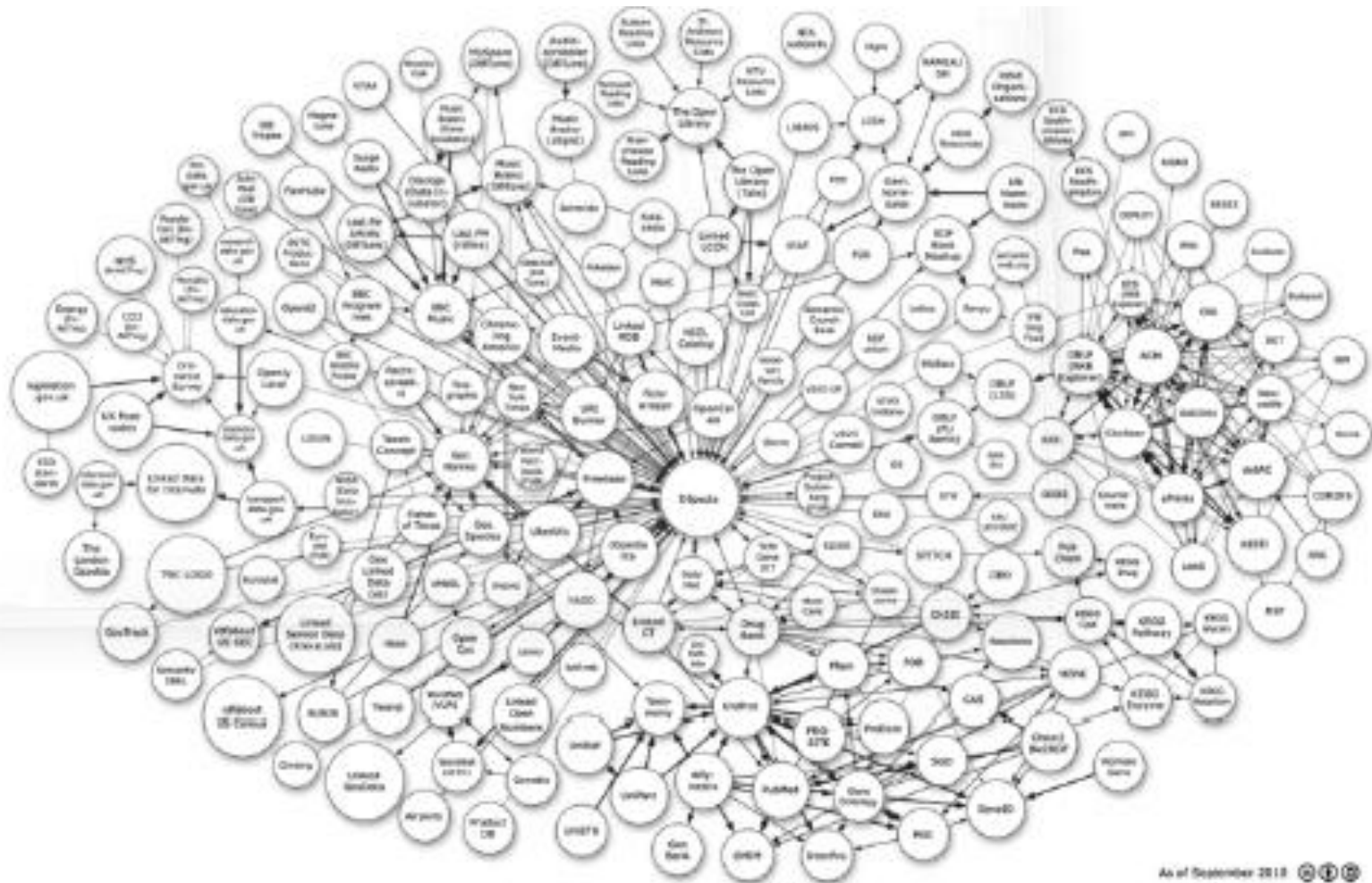
WikiMapia

Mapeados
Participantes
Multimidia
No Celular
Blog

Mapa do Brasil com marcadores de pontos de interesse e locais de mapeamento.

Rede Jovem O Projeto Contato Participe FAQ In English

Linked Open Data Cloud



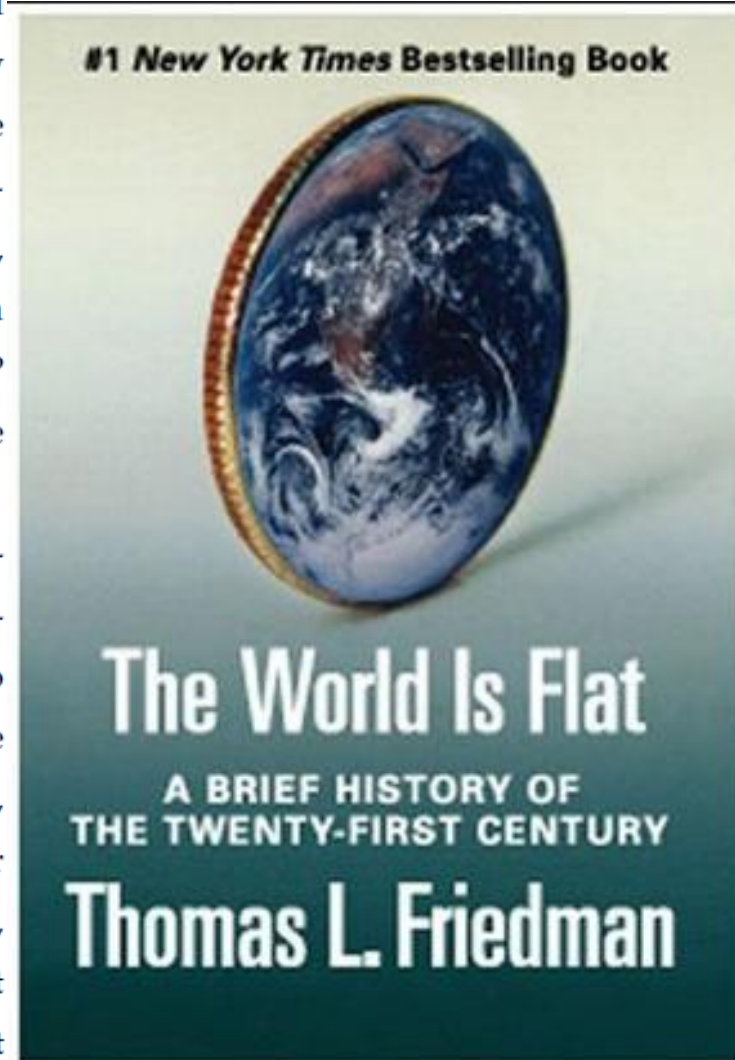
As of September 2018. © 2018



Economic value of geospatial data could reach
\$700 billion/year by 2020 *(McKinsey Global Institute)*

. It is about what I call “the steroids.” I call certain new technologies the steroids because they are amplifying and turbocharging all the other flatteners. They are taking all the forms of collaboration highlighted in this section—outsourcing, offshoring, open-sourcing, supply-chaining, insourcing, and in-forming—and making it possible to do each and every one of them in a way that is “digital, mobile, virtual, and personal,” as former HP CEO Carly Fiorina put it in her speeches, thereby enhancing each one and making the world flatter by the day.

By “digital,” Fiorina means that thanks to the PC-Windows-Netscape-work flow revolutions, all analog content and processes—everything from photography to entertainment to communication to word processing to architectural design to the management of my home lawn sprinkler system—are being digitized and therefore can be shaped, manipulated, and transmitted over computers, the Internet, satellites, or fiber-optic cable. By “virtual,” she means that the process of shaping, manipulating, and transmitting this digitized content can be done at very high speeds, with total ease, so that you never have to think about it—thanks to all the underlying digital pipes, protocols, and standards that have now been installed. By “mobile,” she means that thanks to wireless technology, all this can be done from anywhere, with anyone, through any device, and can be taken anywhere. And by “personal,” she means that it can be done by you, just for you, on your own device.



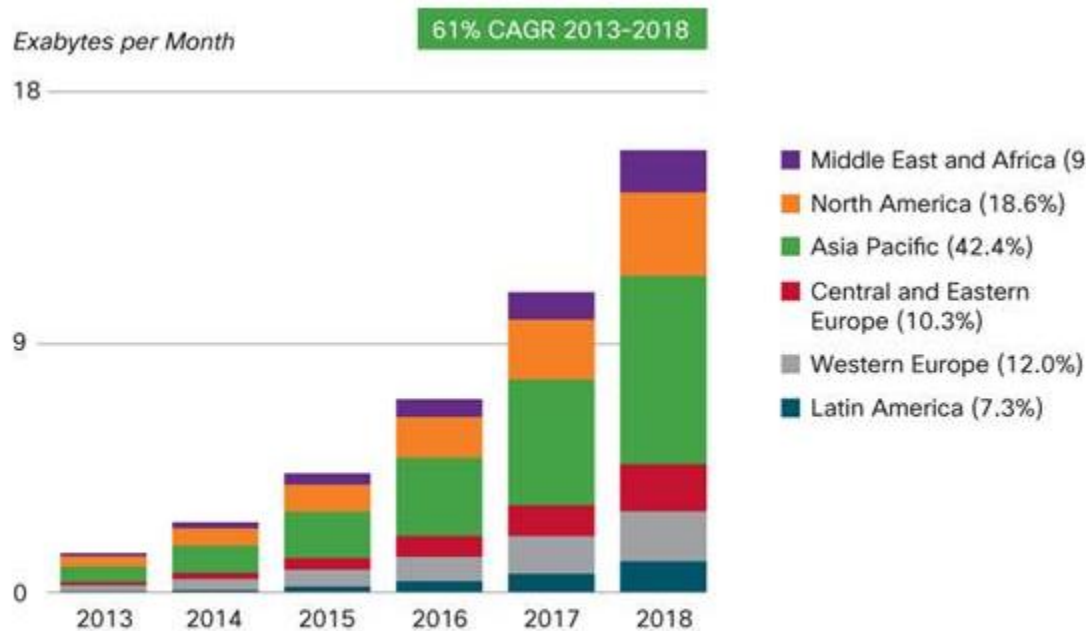
**Digital, Virtual,
Mobile, Personal**

VNI Forecast



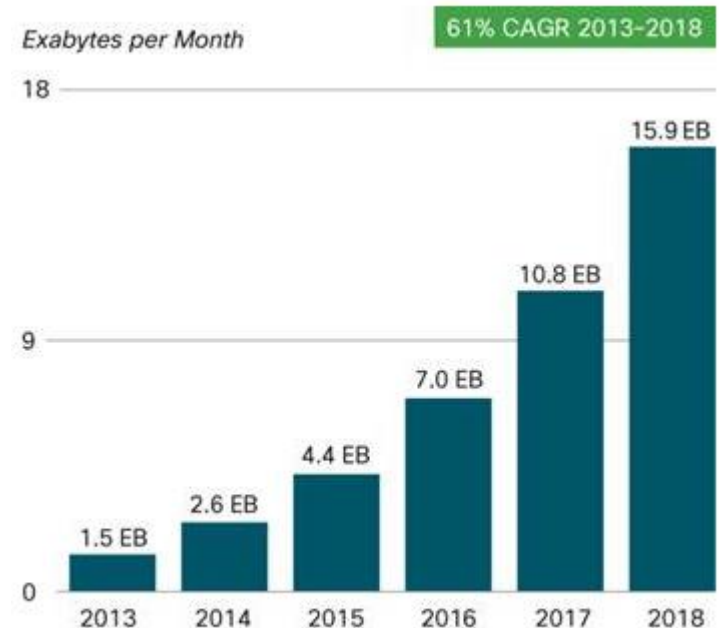
Cisco Visual Networking Index

Global Mobile Data Traffic, 2013 to 2018



Figures in parentheses refer to regional share in 2018.

Source: Cisco VNI Mobile, 2014



Source: Cisco VNI Mobile, 2014

VNI Forecast



Cisco Visual Networking Index

Global Growth of Smart Mobile Devices and Connections



Percentages refer to device or connections share.

Source: Cisco VNI Mobile, 2014

VNI Forecast



Cisco Visual Networking Index

Regional Share of Smart Devices and Connections (Percent of the Regional Total)

| Region | 2013 | 2018 |
|----------------------------|------|------|
| North America | 65% | 93% |
| Western Europe | 45% | 83% |
| Central and Eastern Europe | 15% | 61% |
| Latin America | 14% | 55% |
| Asia Pacific | 17% | 47% |
| Middle East and Africa | 10% | 36% |

Source: Cisco VNI Mobile, 2014



83%

of **IT Managers in EMEA** has
declared that

MORE THAN A HALF

of their IT transactions will be
managed in “cloud computing”

in 2020



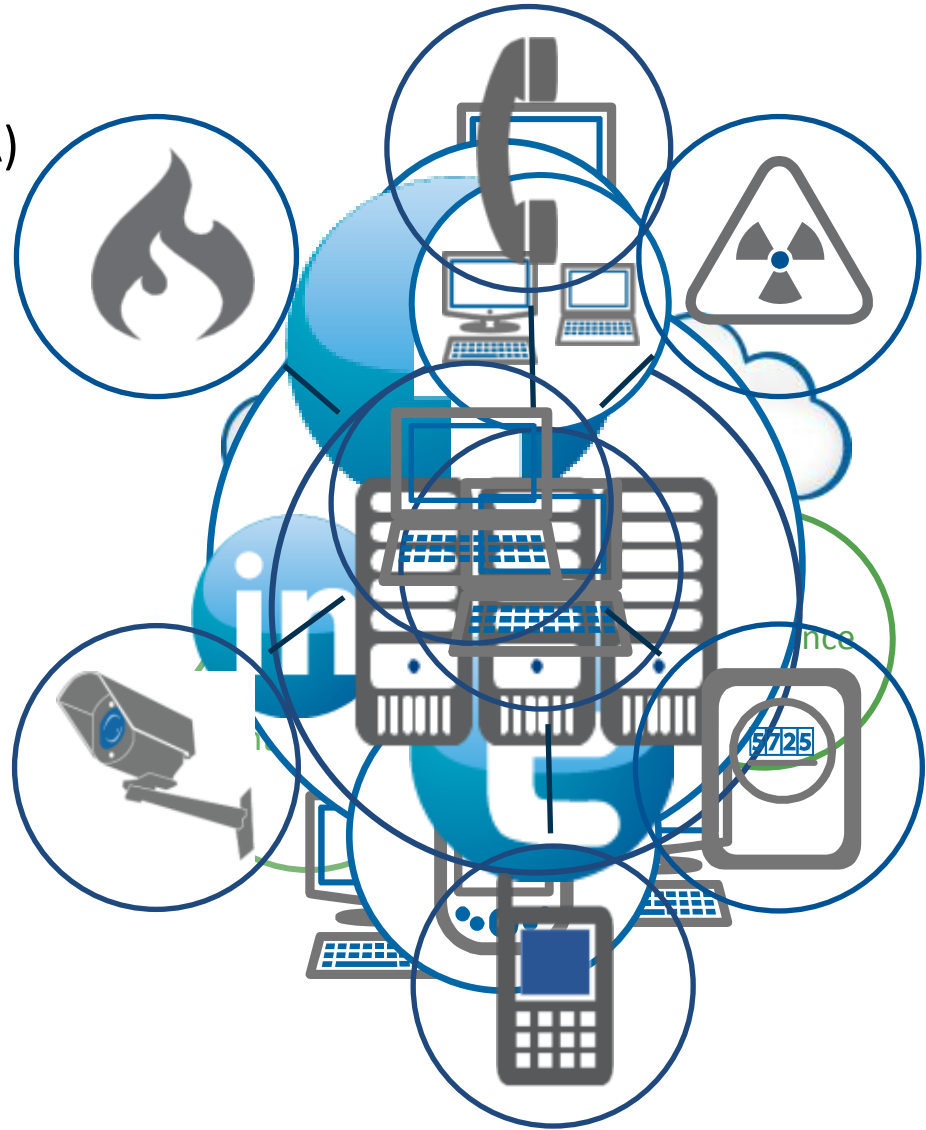
75%

of the TOTAL IT spending
is devoted to

**MAINTENANCE
& UPGRADE**
(West Europe)

Global Trends. Therefore, *CHANGE*...

- Services-Oriented Architectures (SOA)
- Cloud Computing
- Mobility
- Social Networking
- Virtualization
- Sensors Integration
- Communication Convergency





HEXAGON

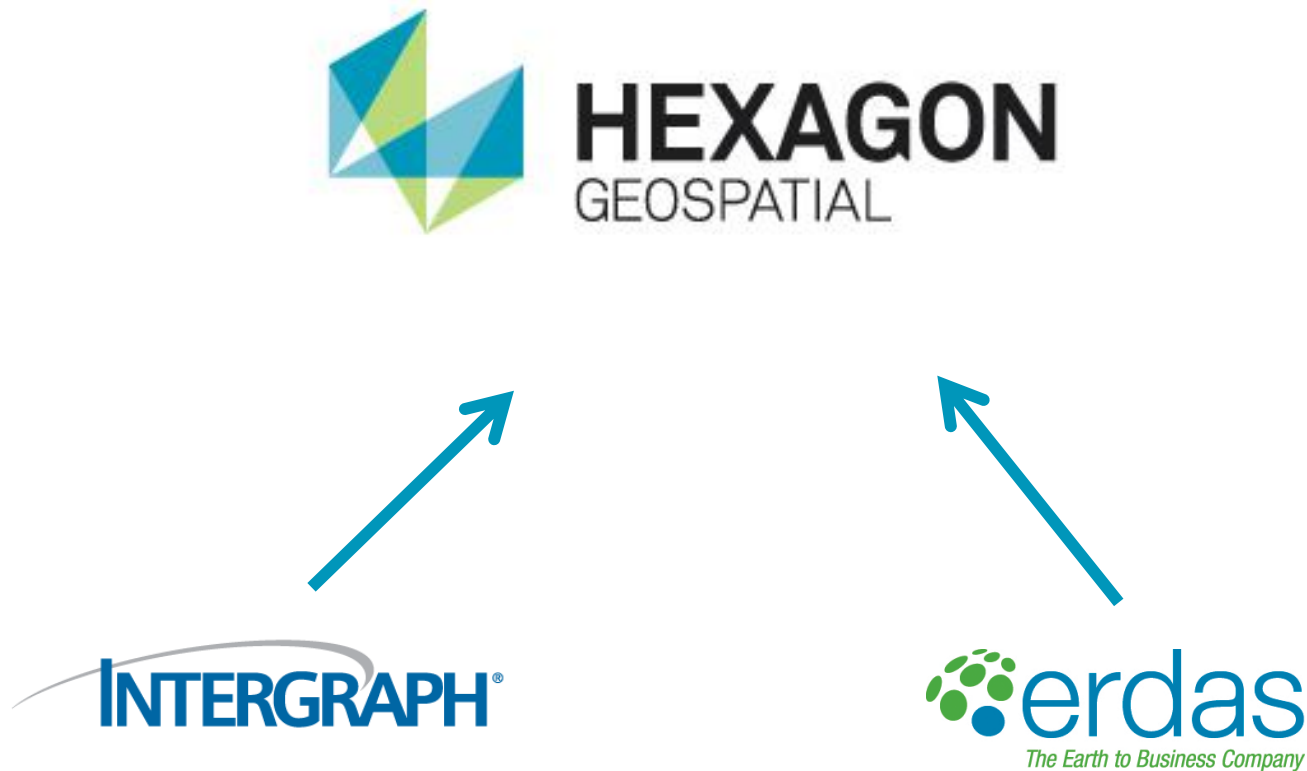


HEXAGON TECHNOLOGY

- A **world-leading** supplier of enterprise engineering, geospatially powered software solutions and high-precision positioning equipment
- **Customers** are security and defence, utilities and communications, oil and gas, metals and mining, nuclear and power generation, marine, offshore and shipbuilding, and government institutions
- **Growth drivers** include an increased need for energy (oil price and capex) as well as for public safety and, globally, geospatial technologies

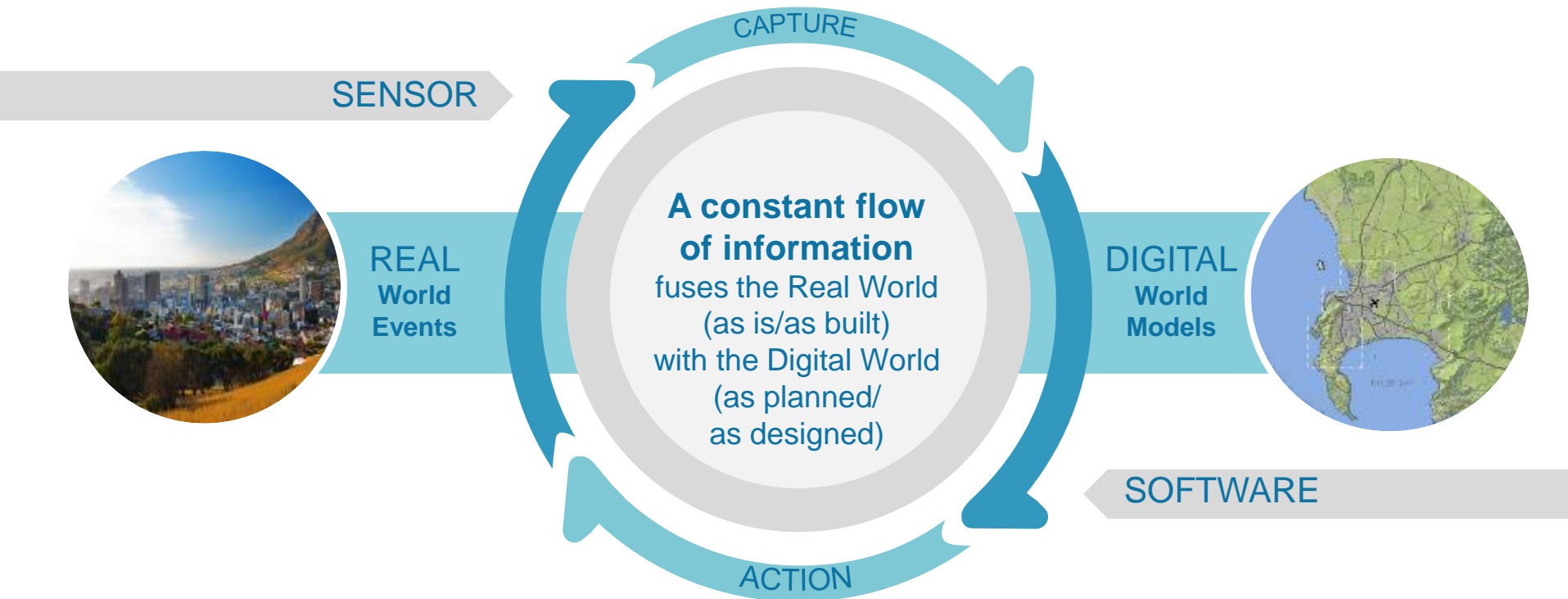


Join the best of geospatial SW components



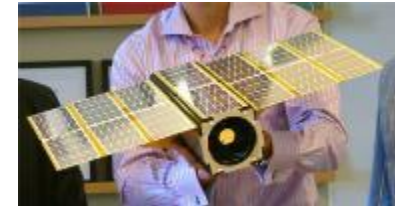
HEXAGON Advantage

Fusing the Real and Digital World



Sensors 'Sense' and Collect Raw Content

Space



Air



Ground



Software Identifies, Organizes, Processes and Analyzes Content



We Decide and take Action



Geospatial Challenges Facing Our Industry

- Too much time passes from Change to Action – Not Smart
 - We need to shorten the Geo-Information Lifecycle
 - Automation is Required – Leverage Upstream Metadata and Multi-Source Content
- We need to address the Big Data Problem for Geospatial
 - Management – Cataloging
 - Storage Costs
 - Delivery Speeds
- Streamline Analytics that communicate relevant information and answers
- Get Mobile
 - Light Weight Apps
- Address Access Problems
 - Content
 - Apps

Our Niche Areas Today



1. Data to Information Automation

2. Big Data Management

- *Cataloging*
- *Compression*
- *Delivery*

3. Geospatial Analytics

- *Spatial Modeler & Query Tools*

4. Solution Platforms

- *Smart Client + Portal + Mobile*

To simply be the best geospatial software platform for 'Making Sense' of our dynamically changing world.

To Pioneer the Next Generation of Mapping

Our **Mission**: To Transform and Be Transformed



Technology:

Shorten the Lifecycle from 'Change' to 'Action'

Make it Easy

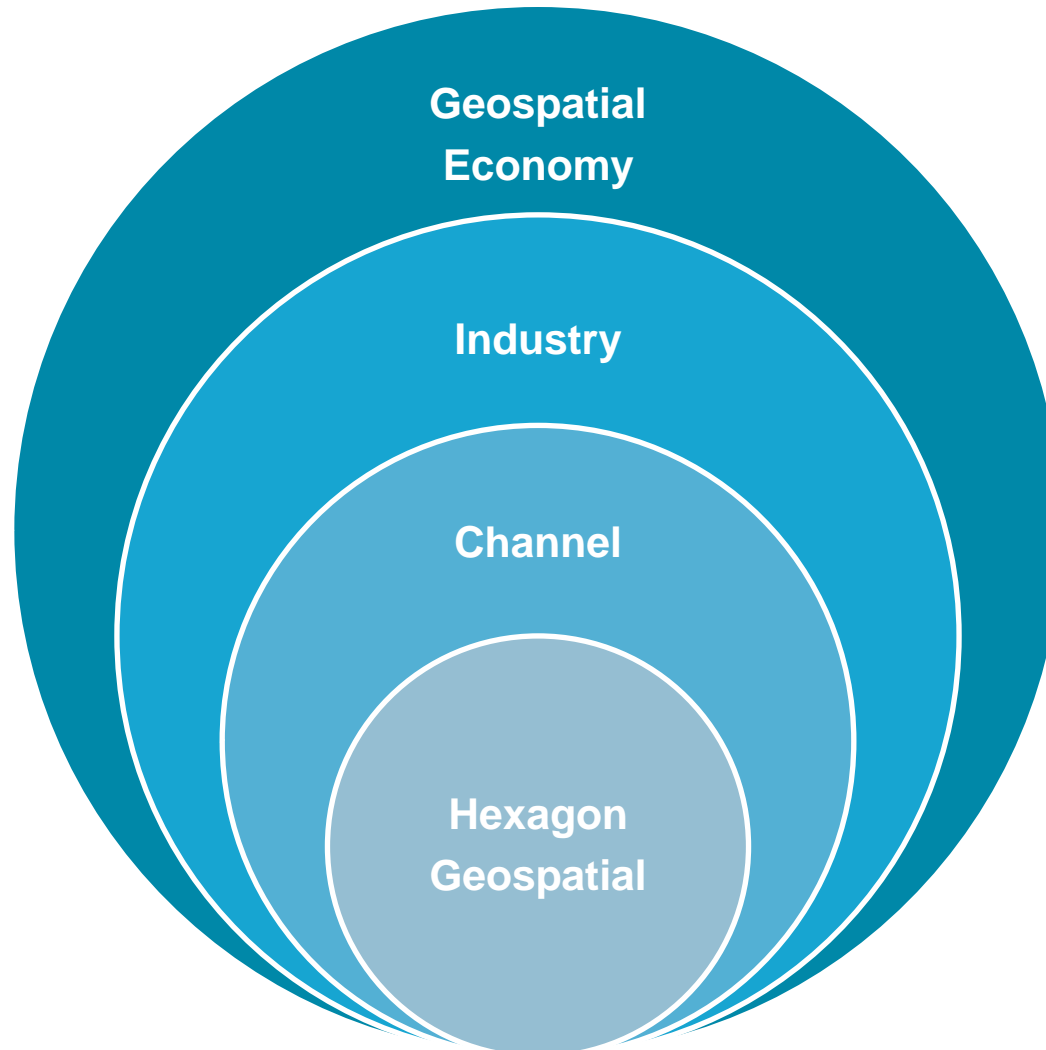
Make it Human

Make it Dynamic

Business:

**Supporting you to redefine the Geospatial
Industry and it's underlying Economy**

The Power of Transformation: 'Project Windmill'



The Power of Transformation

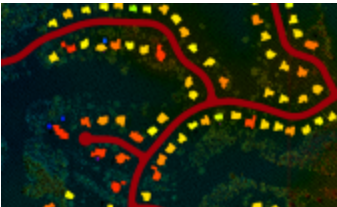


Portfolio, Business and Industry Transformation





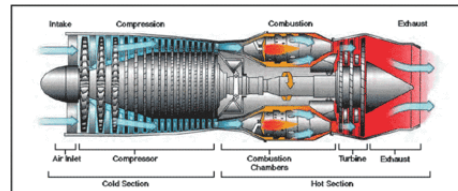
Harnessing Change to Deliver Dynamic Information



Content

Satellite Data Providers
HGS Sensor Customers
Government

+



Software Platform Hexagon Geospatial Division

+



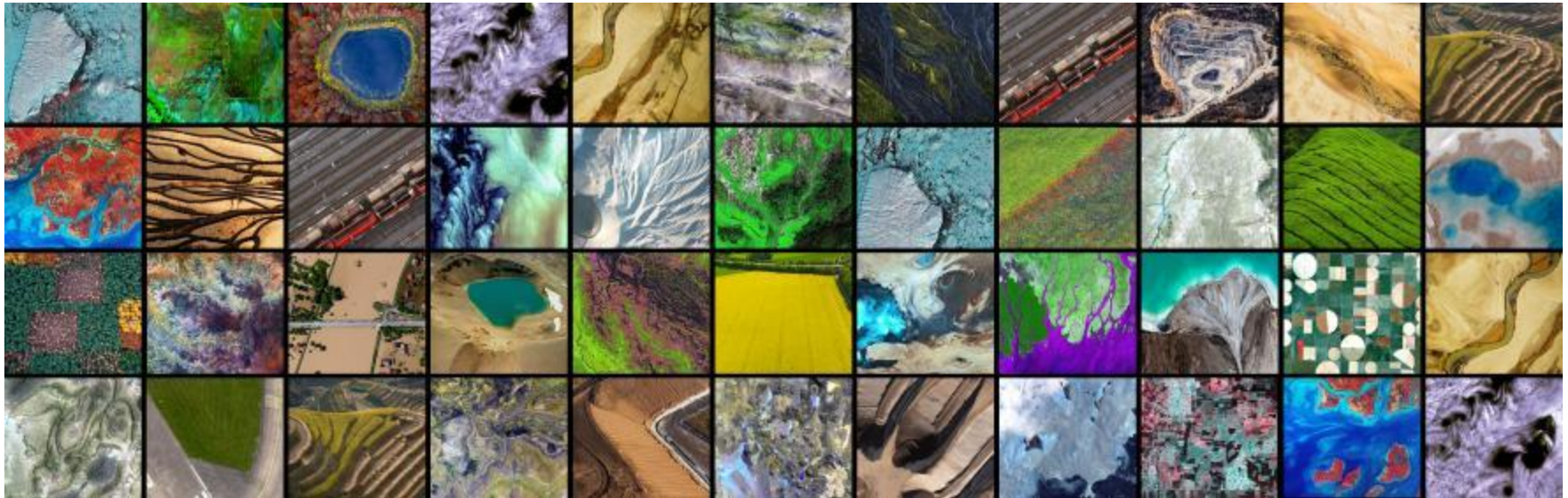
Industry Solutions

SG&I
Hexagon Solutions Division
Distributors
Partners

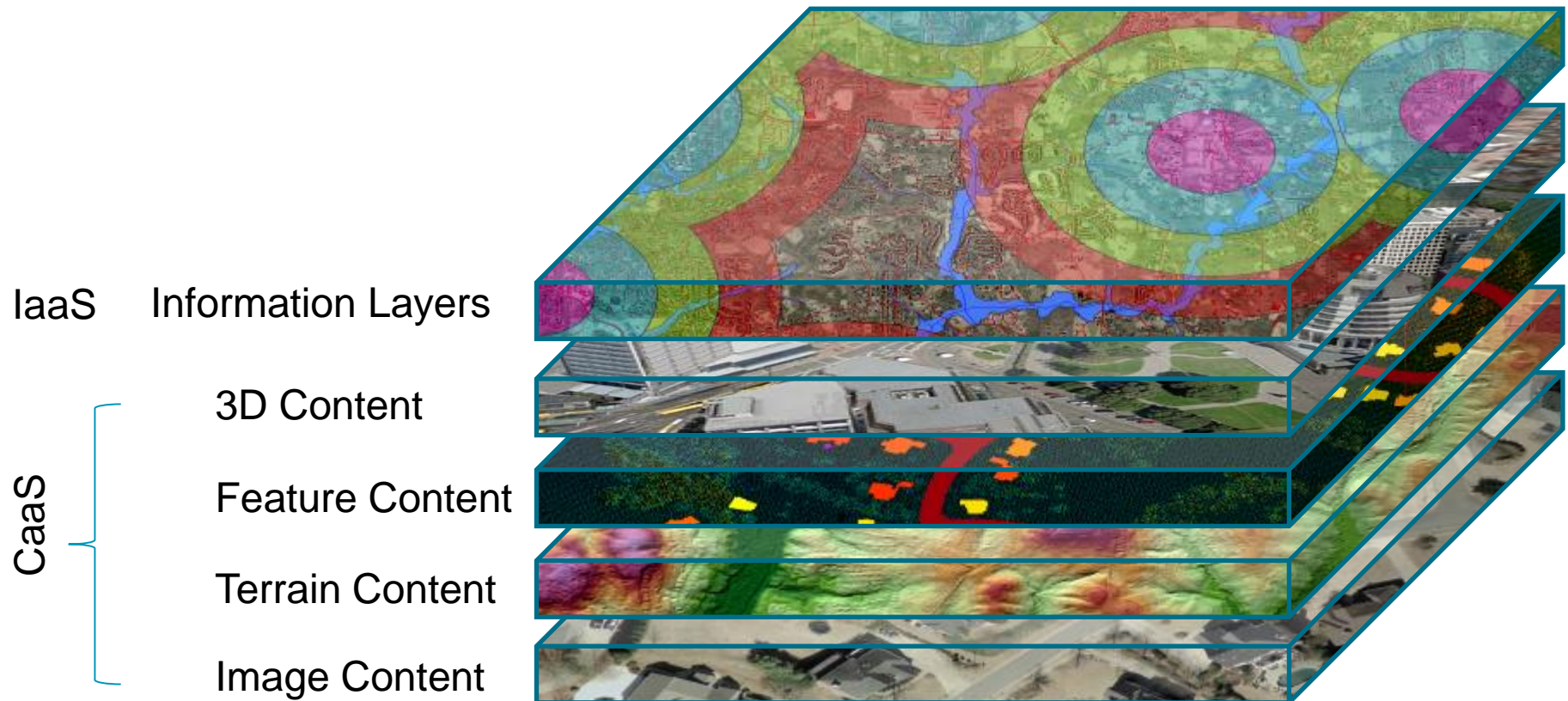
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**Delivering
Information
& Solutions
That
Makes Sense**

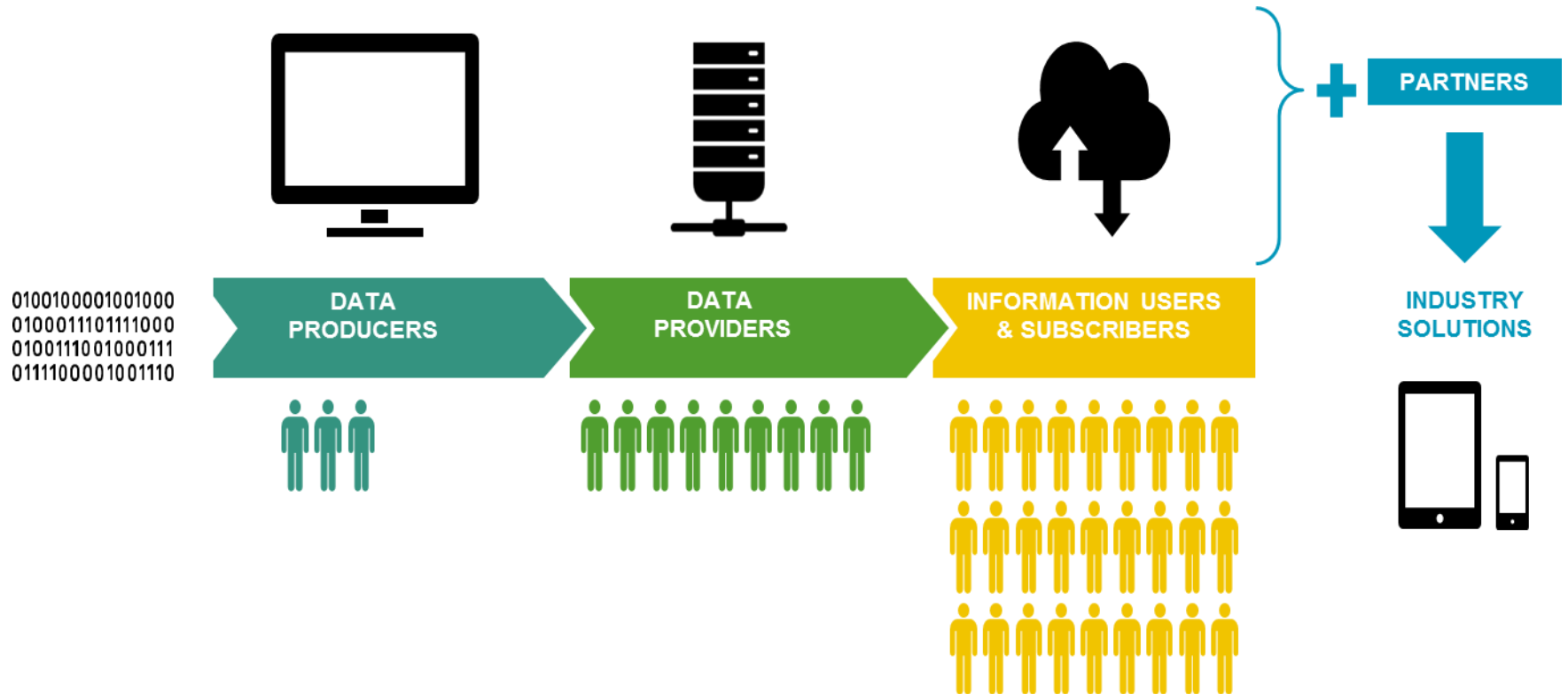
Hexagon Smart Content Program



Geospatial Content As a Service



The Power to Transform Content Into Solutions

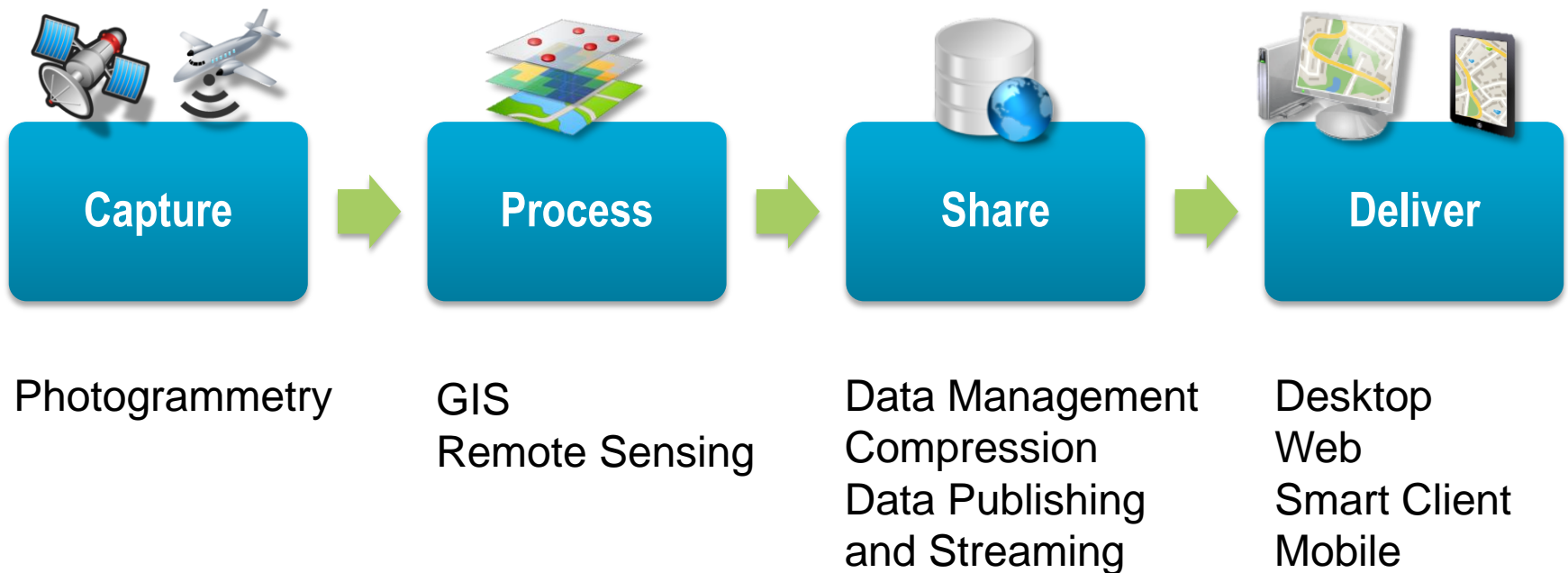


Project 'Wind Mill' Phase I

2014: simplify and address needs

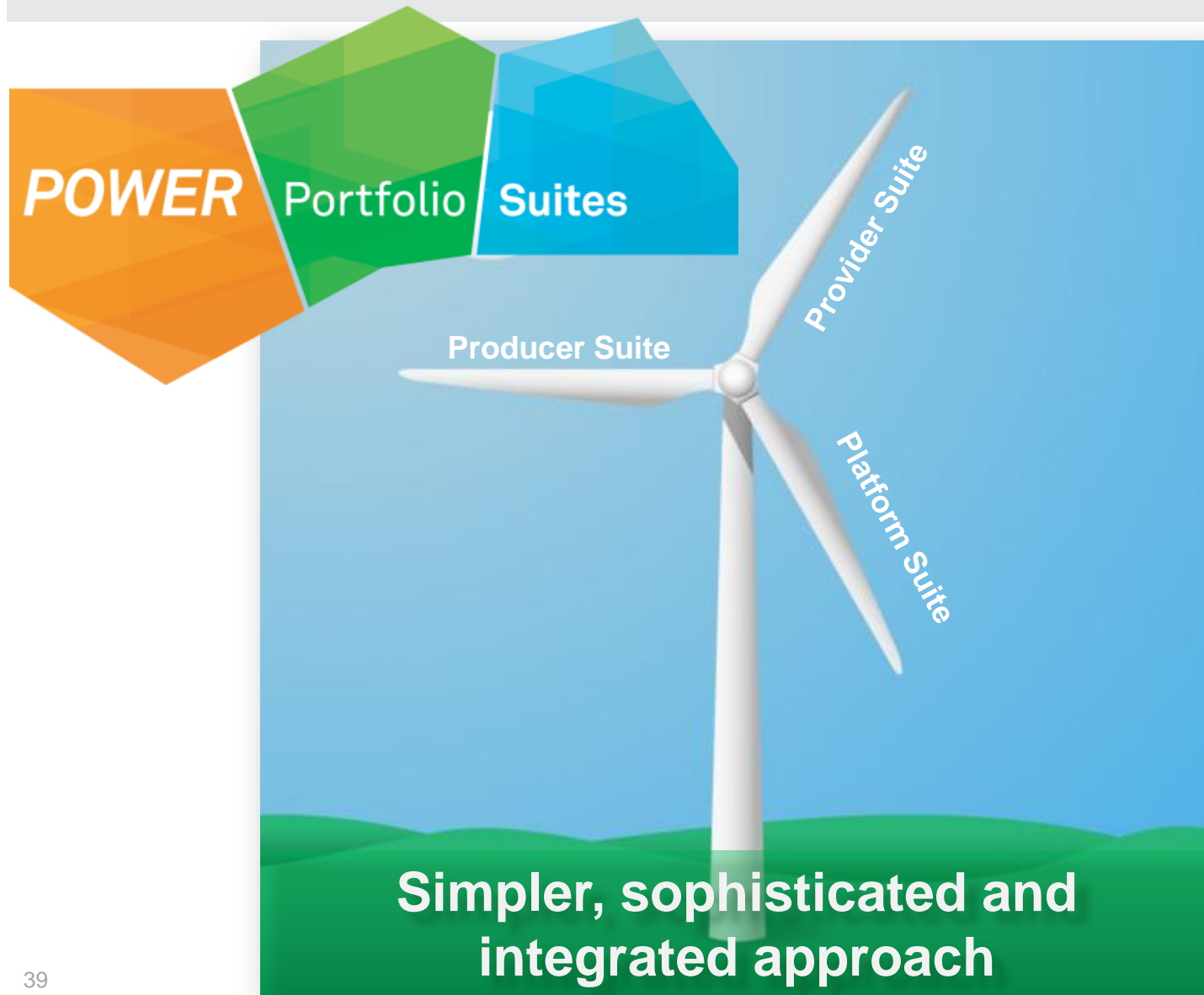
Hexagon Geospatial

Making Sense of the Dynamically Changing World



Complete coverage of the geospatial information life cycle

A New Approach – The Geospatial Power Portfolio



POWER Portfolio

Producer Suite

PRODUCER SUITE:
POWER to AUTHOR

ERDAS IMAGINE

GeoMedia

ImageStation

Collect, process, analyze and understand raw geospatial data,
and ultimately deliver usable information.

Producer Suite - GIS

POWER Portfolio
**Producer
Suite**

GeoMedia

Comprehensive, dynamic GIS

- **Provide Meaningful Business Intelligence**

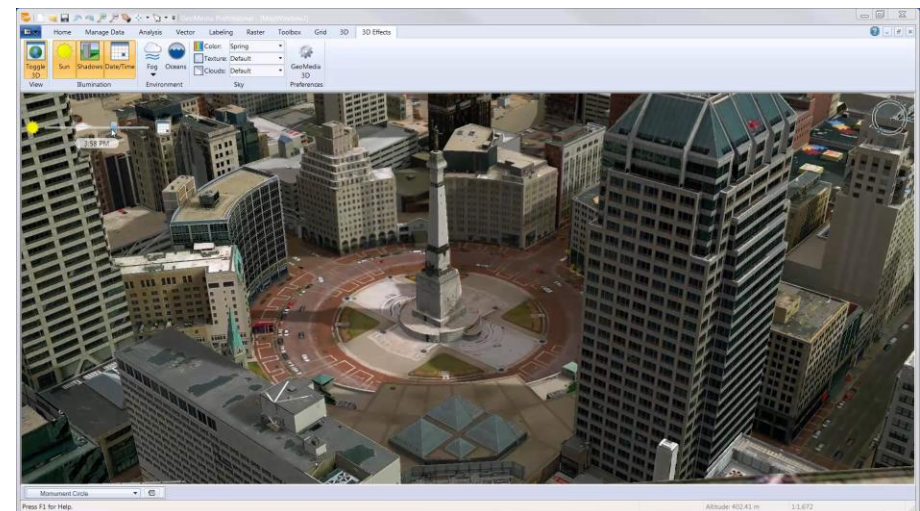
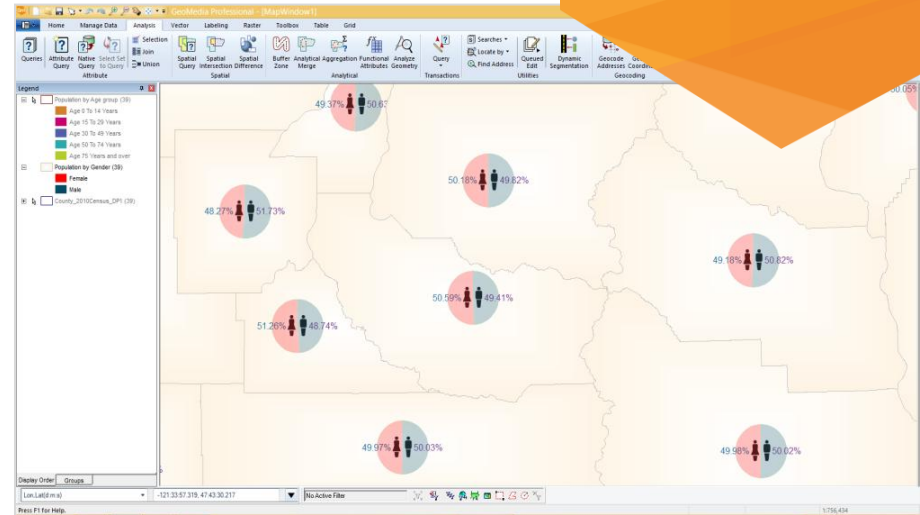
Combine multiple geospatial data sources to obtain a clear understanding of real-world scenarios.

- **Deep Analysis**

Powerful analysis and intuitive workflows guide users through performing complex tasks.

- **Smart Mapping and Visualization**

Build and publish intelligent cartographic-quality maps and create interactive 2D and 3D web experiences.



Producer Suite – Remote Sensing

POWER Portfolio
Producer Suite

ERDAS IMAGINE

The world's most widely-used remote sensing software package

- **Expert-level Analysis and Processing**

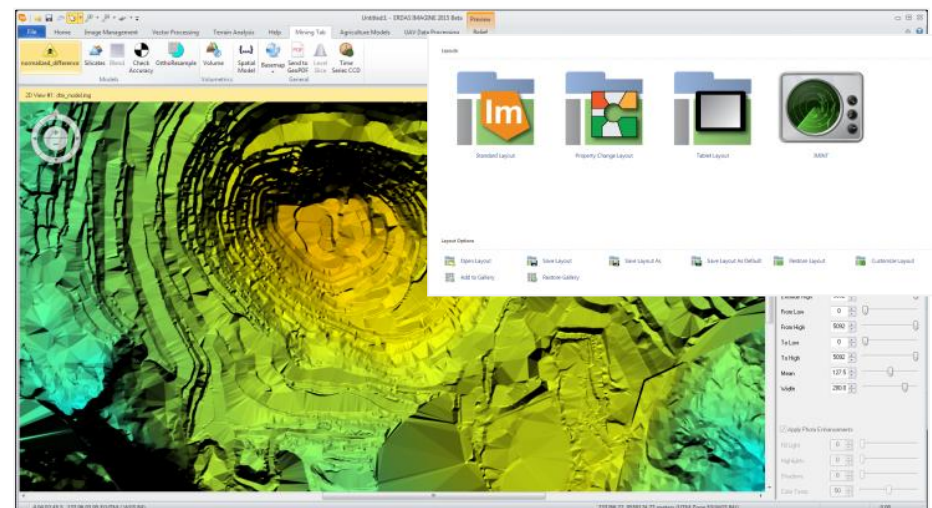
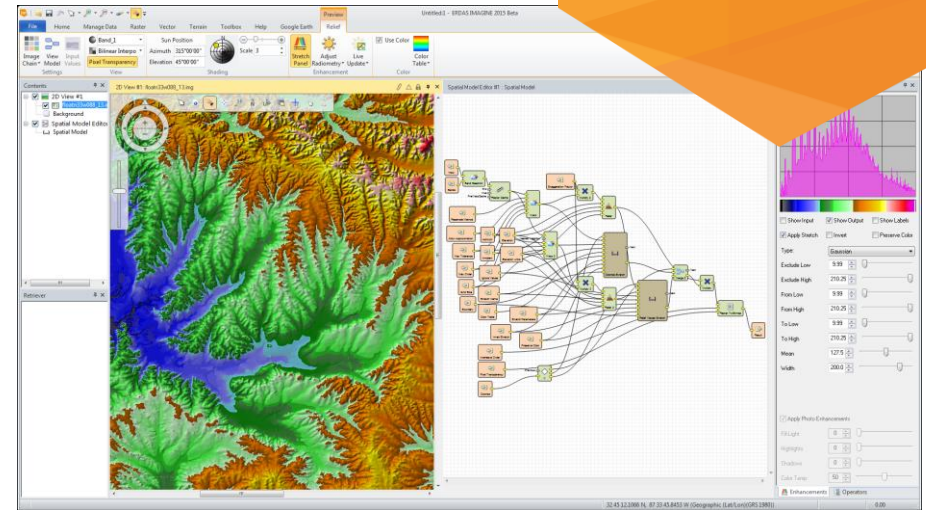
Advanced geospatial analysis to reveal meaningful information from a wide variety of imagery, LIDAR and radar data.

- **Simple Yet Powerful**

Automated and wizard-driven workflows guide users seamlessly through complex tasks, resulting in remarkable value-added products.

- **Interoperable and Extensible**

Easily customize or modify powerful analytic workflows to meet highly-specialized project requirements.



Producer Suite – Photogrammetry

POWER Portfolio
**Producer
Suite**

ImageStation

High Volume Photogrammetry and Production Mapping

- **Enables digital photogrammetry production workflows**

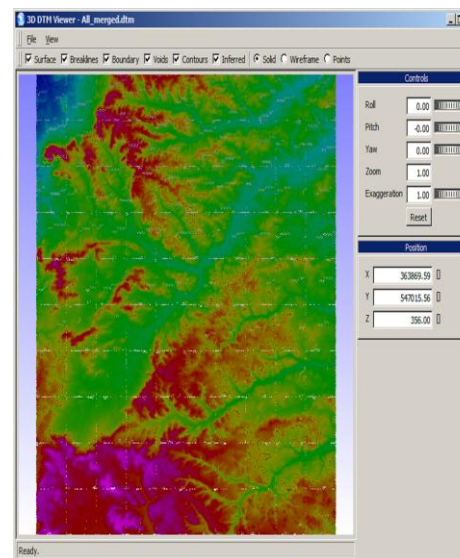
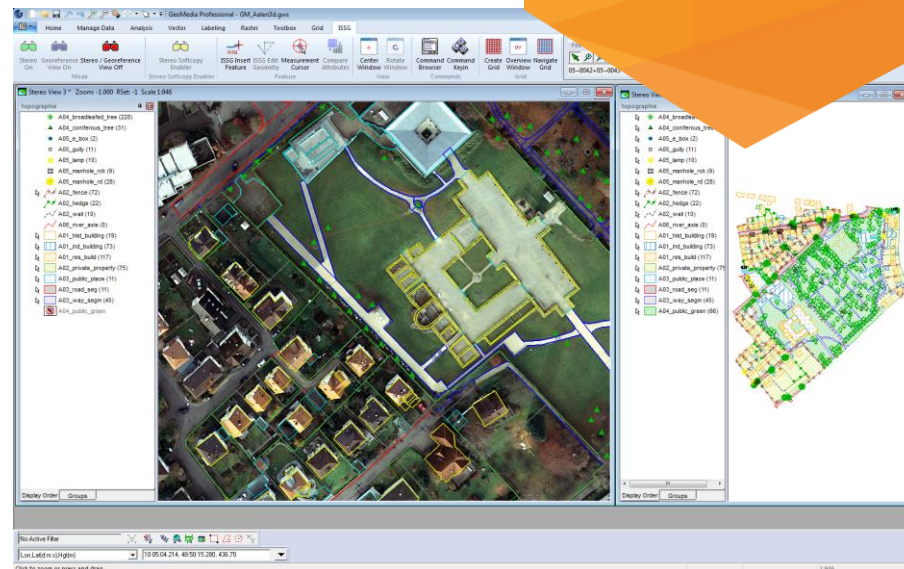
Project creation, orientation and triangulation from aerial and satellite imagery.

- **Customize your solution**

Stereo GIS feature collection and editing, DTM collection, and orthophoto production.

- **Turbocharge your Photogrammetry Workflow**

Optimize DTM creation with new 64-bit engine, setup distributed processing with Condor for Hexagon Geospatial, increase feature collection productivity with GeoMedia GI Toolkit and GeoMedia Feature Topographer.



Producer Suite – Photogrammetry

POWER Portfolio
Producer Suite

IMAGINE Photogrammetry

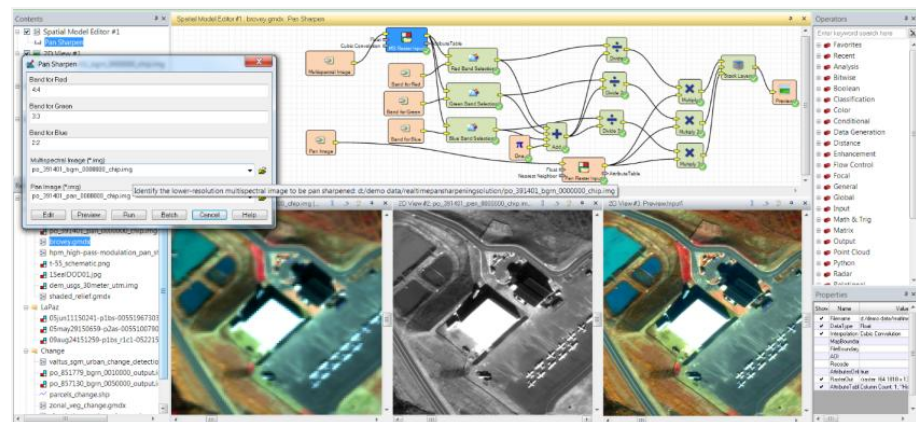
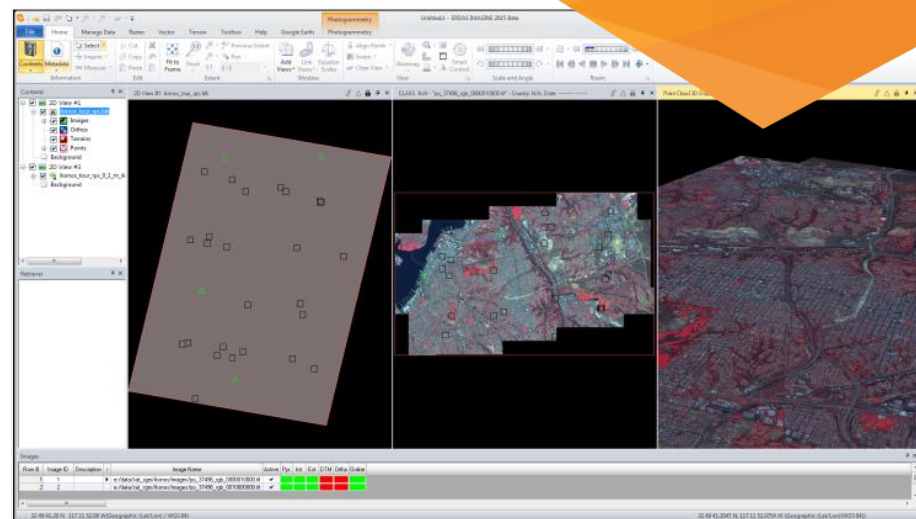
Ideal for Project Photogrammetry workflows, using smaller quantities of raw imagery but various types of source data (raster, vector, LiDAR) and further processing and analysis.

- **Tight integration with ERDAS IMAGINE**

Create powerful extended analysis with Spatial Modeler (e.g. volumetric calculations, change detection, etc.)

- **Create 3D point clouds from satellite stereo imagery**

The SGM algorithm generates very dense and accurate 3d point clouds, providing rich elevation information for subsequent visualization and interpretation.



POWER Portfolio

Provider Suite

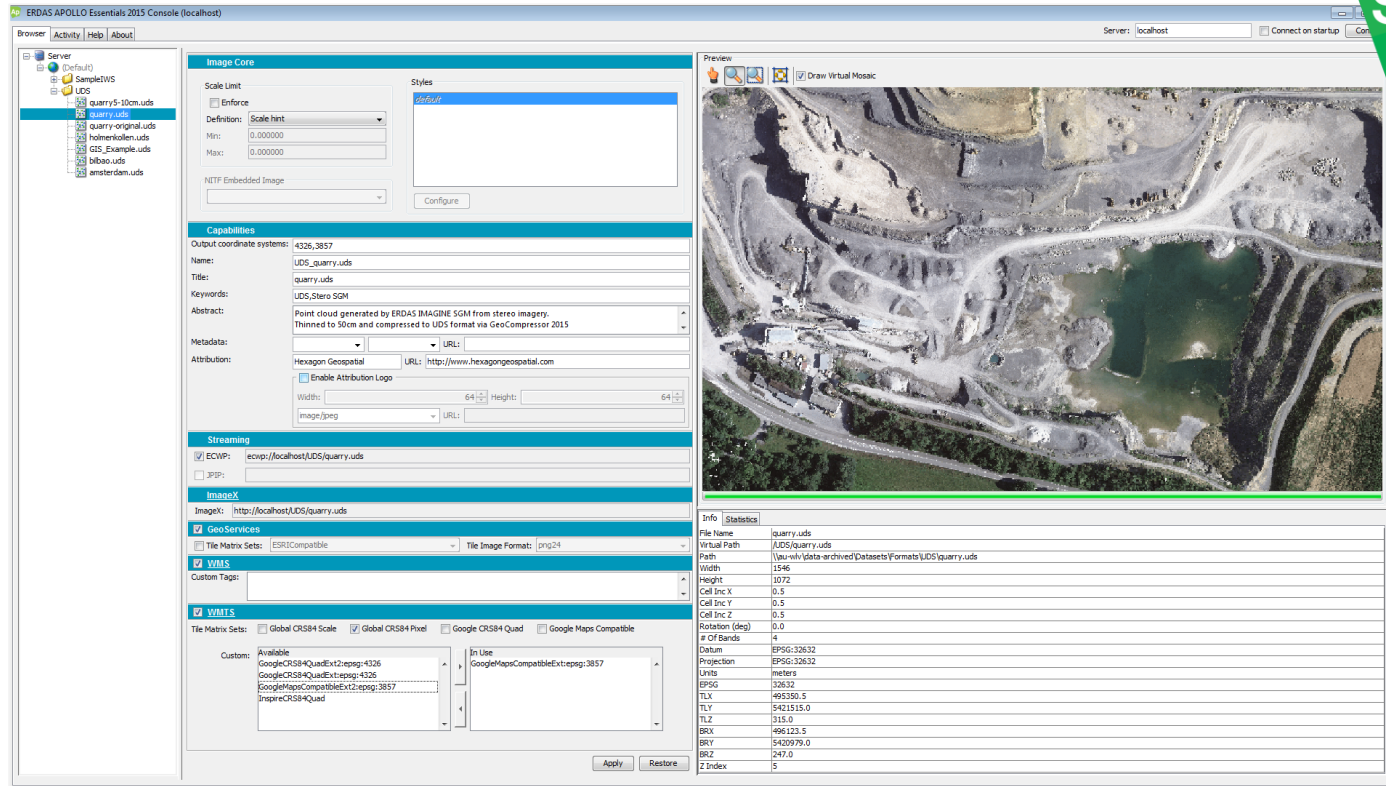
PROVIDER SUITE:
POWER to MANAGE

ERDAS APOLLO
ECW Products

Store, compress, describe, manage and deliver your data in a variety of different ways.

Provider Suite – Data Management

POWER Portfolio
**Provider
Suite**



- **ERDAS APOLLO** - Comprehensive enterprise data management solution that helps organizations catalog, publish, and deliver large volumes of geospatial data to different types of client applications.

Provider Suite – Data Compression

POWER Portfolio

Provider
Suite



- **ECW Products** – Based on high-performance image-compression format that reduces terabyte-sized imagery files to five-to-ten percent of their original size, while retaining full visual quality.
- Delivers lightning-fast display performance, and enables faster processing and transfer of imagery.

POWER Portfolio

Platform Suite

PLATFORM SUITE:
POWER TO BUILD SOLUTIONS

GeoMedia Smart Client

GeoMedia WebMap

Geospatial Portal

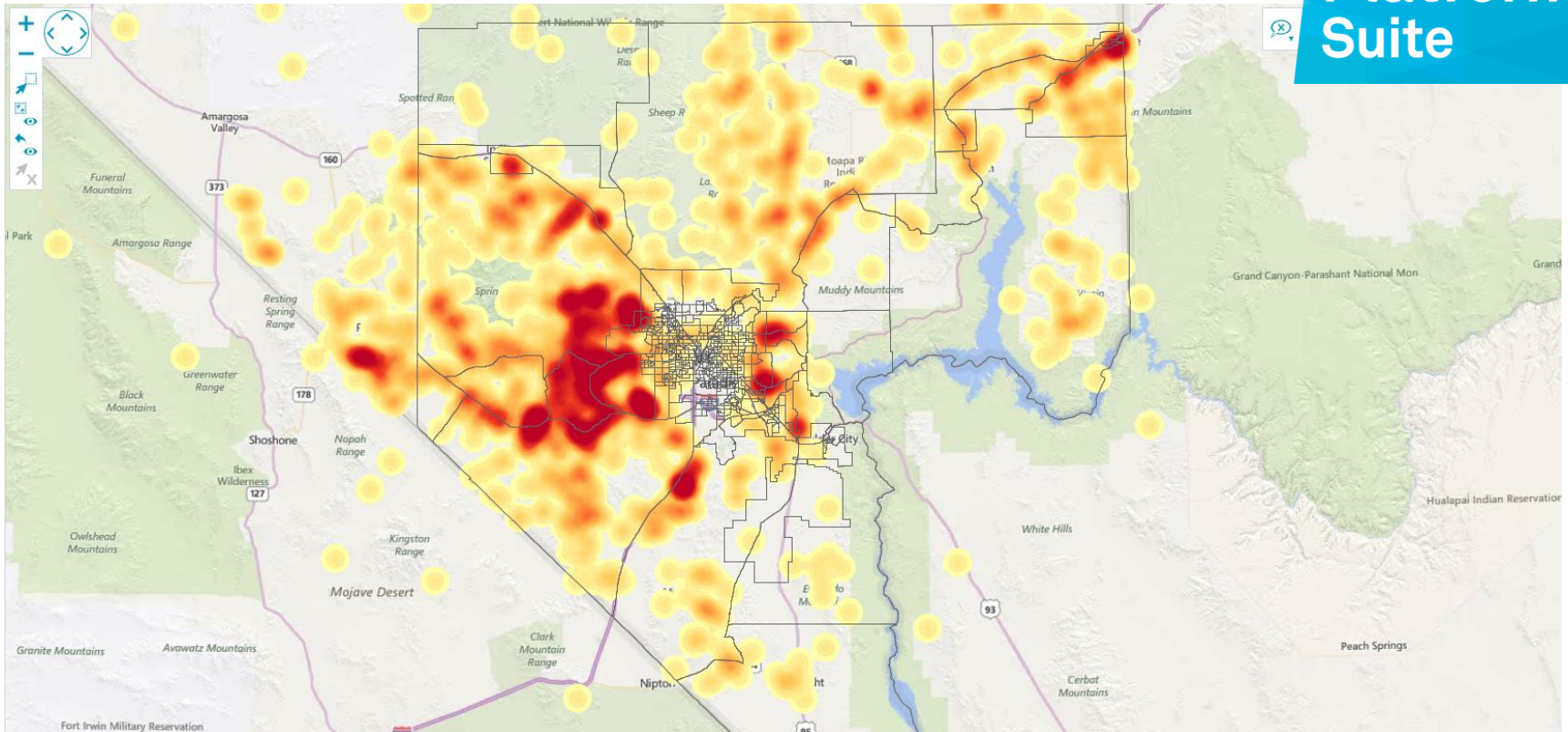
Mobile Alert

Mobile MapWorks

Create unique solutions on top of a solid foundation of powerful geospatial functionality.

Platform Suite - GeoMedia Smart Client

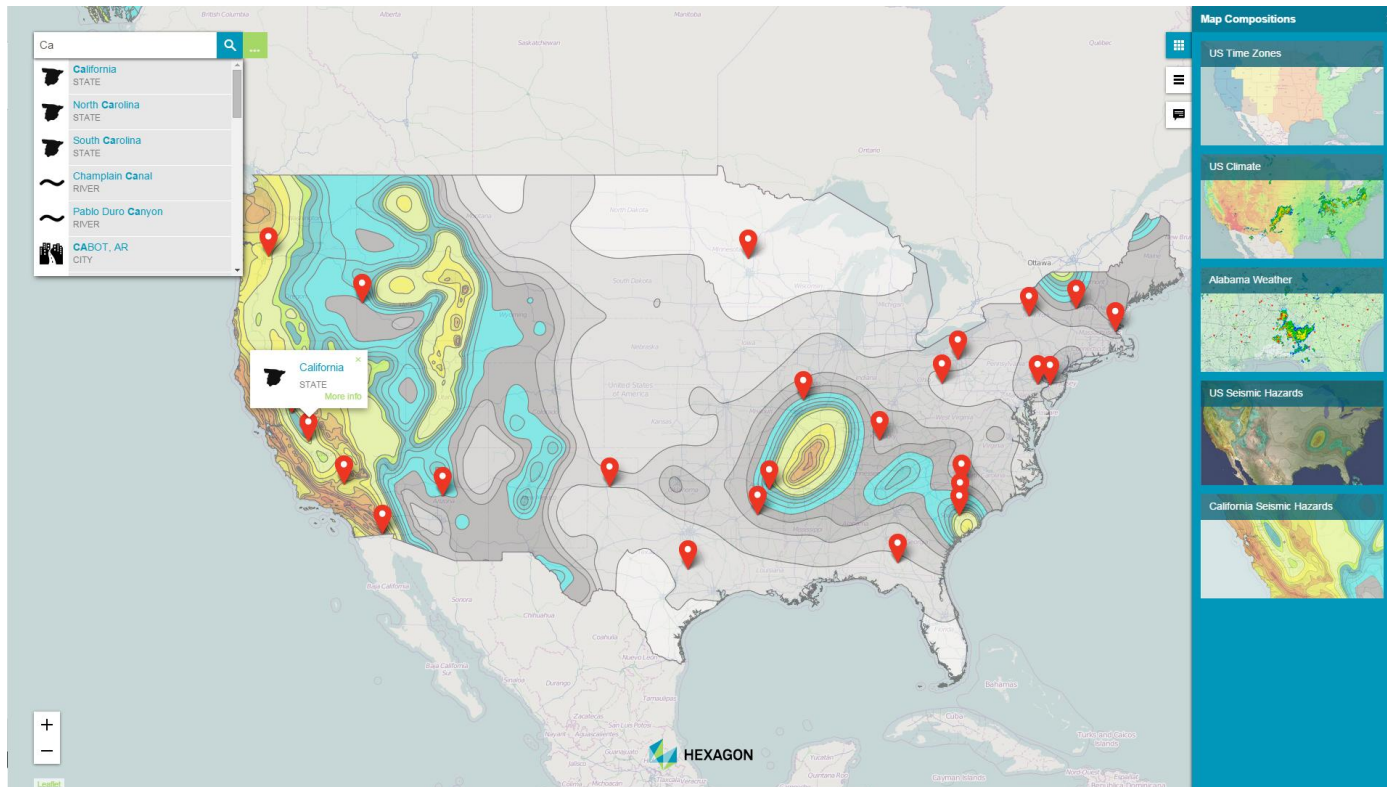
POWER Portfolio
**Platform
Suite**



- Easily create and deploy highly focused, geospatial business workflows
- High-end vector data capture, query and analysis tools, large-format printing
- Advanced geo-caching for high performance, disconnected mobile editing

Platform Suite - Web GIS

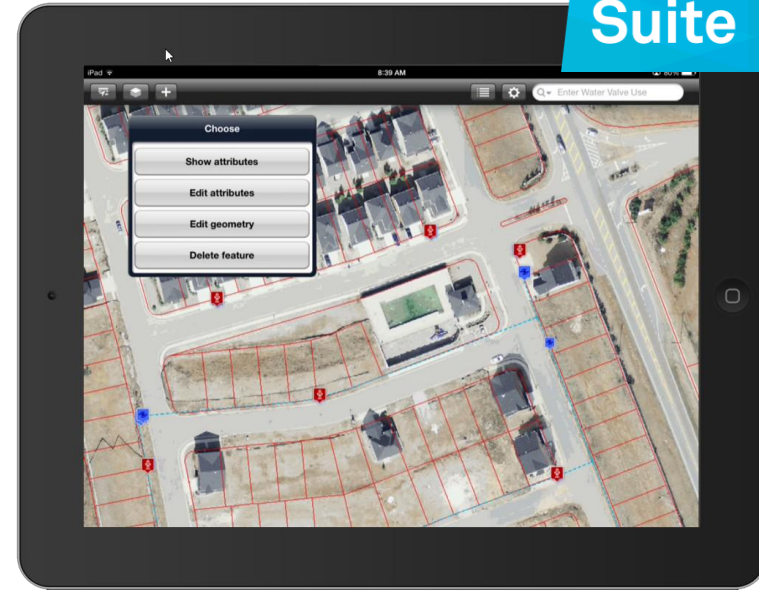
POWER Portfolio
**Platform
Suite**



- Hexagon Geospatial's Web GIS integrates the power of **GeoMedia WebMap, Geospatial SDI and Geospatial Portal** products to provide:
 - Real-time, web-based enterprise data access and sophisticated analysis
 - Flexible, secured solutions based on standards
 - Full-featured, multilingual, customizable web application

Platform Suite - Mobile MapWorks

POWER Portfolio
**Platform
Suite**

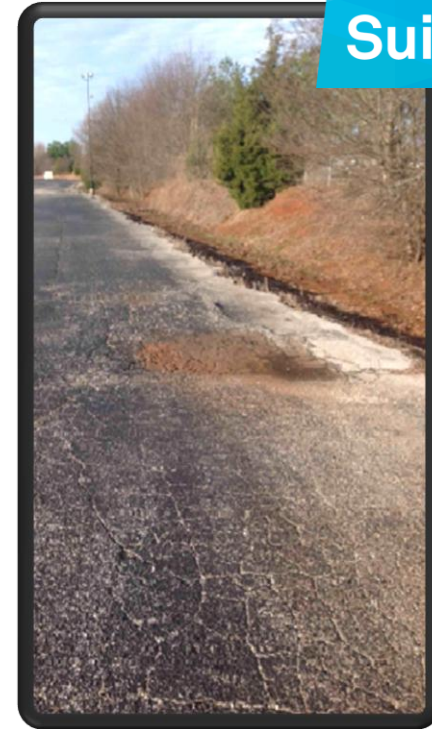
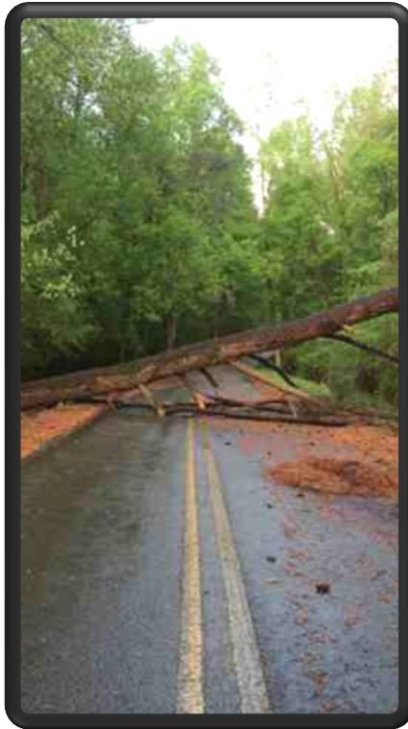


- Tablet-based app for field personnel and crews, supporting a variety of field-based workflows against enterprise GIS data
- Allows customers to see, edit and update their asset information, in the field
- Works on the same devices (iOS and Android tablets) that you use in every day life. Simple and intuitive requiring little training and makes new users more productive

Platform Suite - Mobile Alert

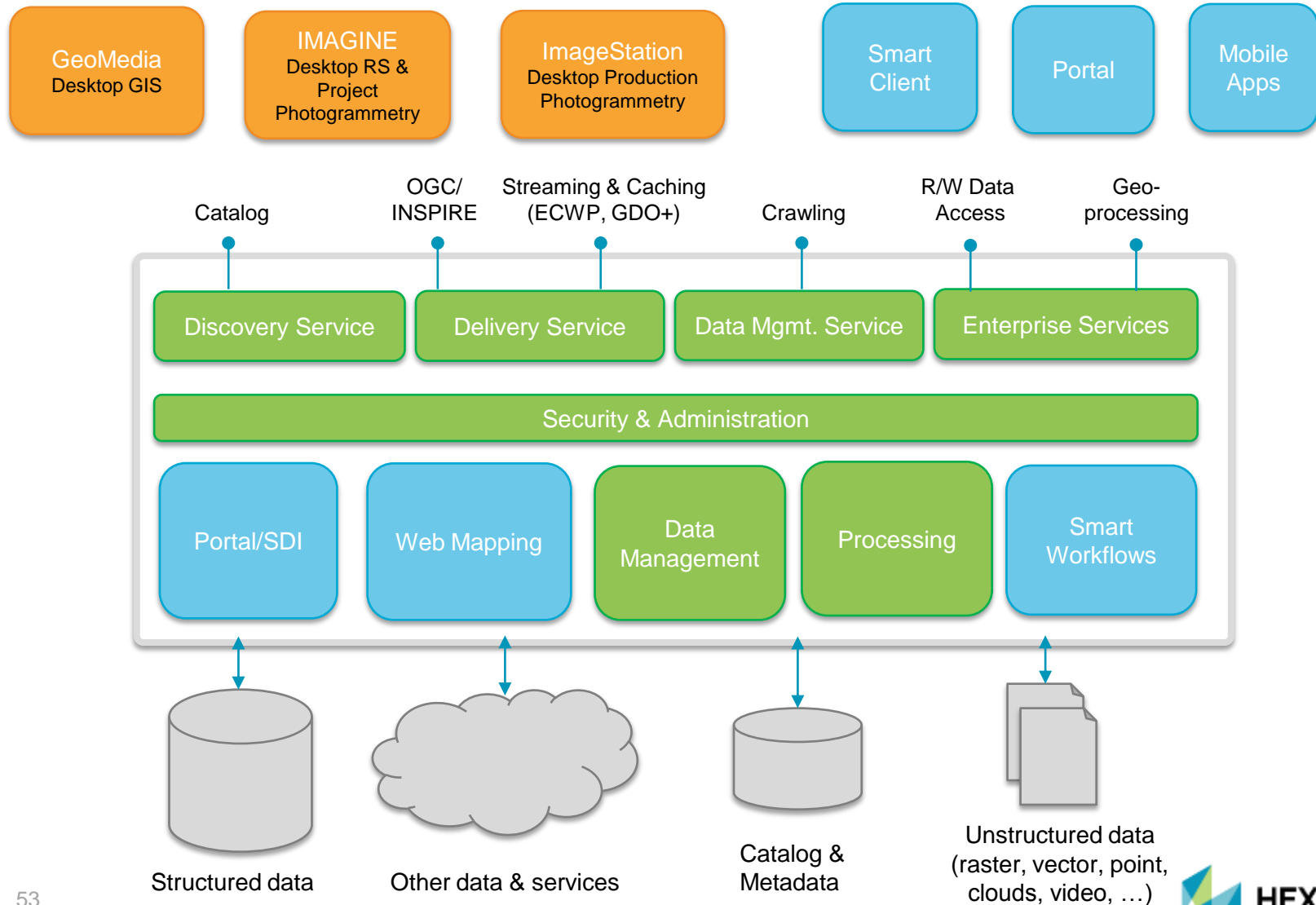
POWER Portfolio

Platform
Suite



- Easily report incidents or public works related issues to subscribing organization
- App is freely available to download from app stores for iOS and Android devices
- Hosted backend relieves subscribing organizations of IT support and upgrades

Hexagon Geospatial Power Portfolio





Project 'Wind Mill' Phase II

2015: technology evolution and revolution

Market Drivers



Content

New wave of content sources, from new satellite platforms (“micro-sats”) promising daily refresh rates through UAV/UAS platforms.



Virtualization and Cloud

IT services are being virtualized, and offered in hosted, cloud-based environments.



Pricing models

Software industry transforming from on premise deployments to cloud-based subscription-based models

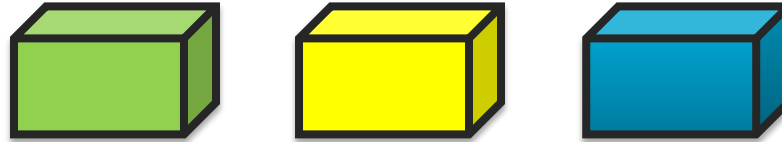


Analytics

Increasing demand for access to online analytics and information services that support decision-making.

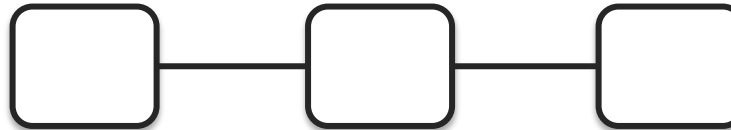
Partner Development Platform

**Industry
Applications**



Web & Mobile SDKs

**Graphically &
Programmatically
Orchestrate
Workflows**



Smart Client Workflow Manager

Analytics Engine



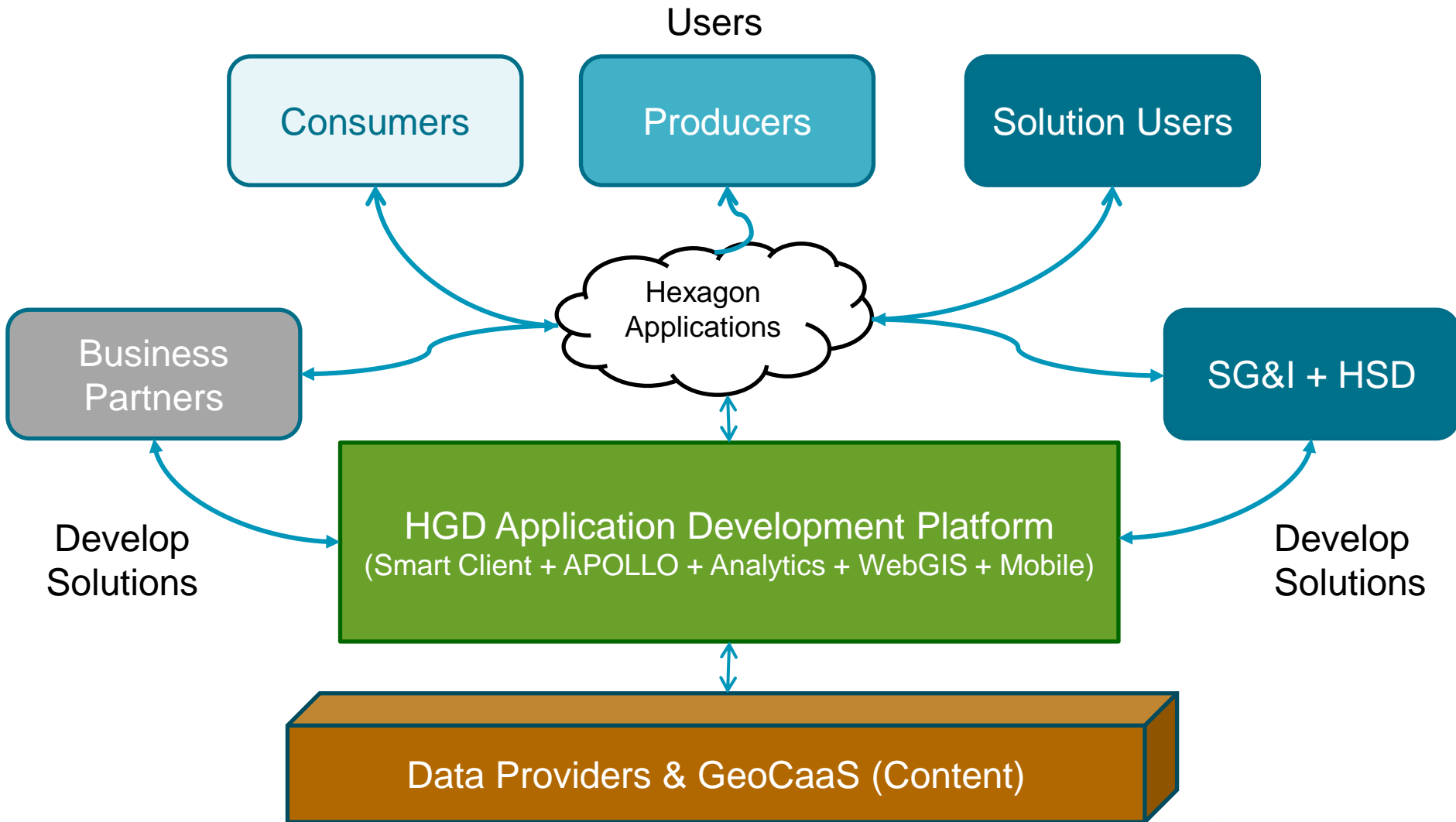
Spatial Modeler SDK

Core technology

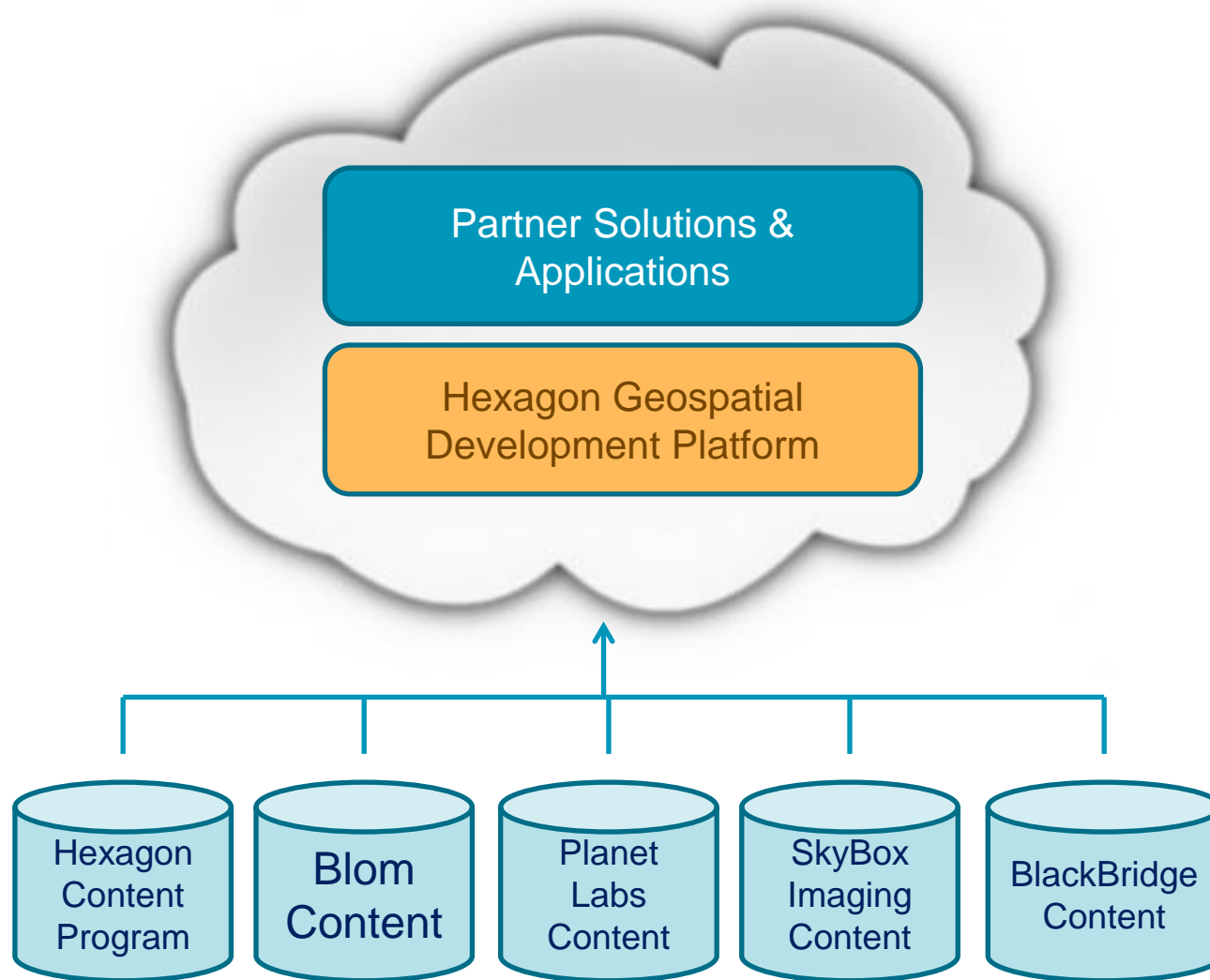


Geospatial Platform Technologies

Partner Application & Solution Platform



Accessing Content



Today and Looking Forward



As an industry we need to do a better job of making sense of our dynamically changing world by combining sensors, with the best geospatial software focused on providing solutions that work together in a smart way.

Our Customers and Partners are our history, our value and our future

Thank you!