We Have One Constant
In An Instant .....
… Our World Can Change
…To Analyze the Change….
…And to Respond Accordingly.
A constant flow of information fuses the Real World (as is/as built) with the Digital World (as planned/as designed).
Smart Applications of Geospatial Technologies

- Defense
- Response
- Resources
- Utilities
- Urbanization
- Transportation
The Dynamic GIS - A Dynamic Network of Content Software and Solutions

Oliver Zimmermann, EMEA Business Development
POWER PORTFOLIO
BIG data
Is big data “Big Data”?

• “Big Data is a collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications.” – Wikipedia
Big Data Characteristics

- **Big Data is commonly characterized as being big in three dimensions:**

  - **Volume**
    - Very large numbers of pieces of information.
    - Very large pieces of information

  - **Velocity**
    - The rate at which the data is being received
    - The rate at which information must or can be extracted from the data.

  - **Variety**
    - The data is largely unstructured and heterogeneous
Data Deluge

Greater Resolution, Greater Coverage, Greater Frequency
Data Deluge

Greater Resolution, Greater Coverage, Greater Frequency
Data Deluge

New Airborne Data Sources
Data Deluge

New Mobile Data Sources
Lots of Data and No Information?

Lat/Lon: 34.27761N/84.48833W
Acreage: 14.5
Percentage Land Cover:
  60% Grasslands/Herbaceous,
  28% Deciduous Forest,
  12% Developed
Impervious Surface: 12%
Soil Composition: Clay/Loam
Slope Analysis: < 7%
It’s all about your “Bounding Box”

A user should be able to draw a bounding box on a map, declare a slice of time, and discover and access all the available, relevant & authorized information within that area.

**Sensor Data**  EO, Spectral, Radar, LiDAR, Infrared, FMV, in situ, GPS, etc.

**Access from Any Device**  Desktop, Laptop, PDA, Wireless, Smartphone

**Geospatial Data**  Maps, Imagery, Features, Terrain, Place Names, Buildings, Infrastructure, Roads, Political Boundaries, Hydrographic, Geodetic, etc.

**Location References in Unstructured Data**  News Reports, Publications, Manifests, Internet, World Wide Web, Audio, Video, etc.

**Location References in Structured Data**  Relational Databases, Travel Itineraries, Financial Transactions, Corporate Data, Personnel Records, Statistical Data, etc.
POWER Portfolio
Provider Suite

PROVIDER SUITE: POWER TO MANAGE
ERDAS APOLLO
ECW Products
HEXAGON Geospatial Server

- Harvests, manages and disseminates geospatial data
- Empowers web-editing and workflow optimization
- Enables building and deploying scalable web-applications and mobile apps
- Produces web-services based on open standards, such as those from the International Standards Organization (ISO), Open Geospatial Consortium (OGC), or the European Union’s INSPIRE initiative
- Provides a fully functional, multilingual out-of-the-box web-application that enables simple, interactive, and flexible access to geospatial information
Geospatial Server – Manage Big Data

- Organize, describe and distribute volumes of geospatial and related digital data
- Discover data assets easily
- View or download in any client application
Browser Based GIS Tools
Reduce storage 20 – 40x times

ECW image compression:
• Instant storage savings
• Faster performance
• Full visual quality
20cm – all Germany – 38TB data down to – 1TB ECW-image
Mobility

1 Image

38 TB’s

14 TeraPixels

Fast!
Outlook – Make las files slimmer – 10GB → 900MB
Save Cloud storage cost

Amazon S3 cloud storage cost comparison
- 98% lower costs using ECW
- >$4.6k monthly saving
- Up to $73k annual saving

$ cost per month

* Data generated using the Amazon S3 Cloud Calculator
PLATFORM SUITE:
POWER TO BUILD SOLUTIONS

GeoMedia Smart Client
GeoMedia WebMap
Geospatial Portal
Mobile Alert
Mobile MapWorks
Valtus Change detection as service

DYNAMIC GIS USE CASE
Data as a Service (DaaS)

• "Software as a Service" is becoming an acceptable method of acquiring and using applications.

• Data: which is the other side to the story and may be even greater value is getting the attention it deserves.

• Data no longer needs to physically reside within the organization to provide value to users…the hosted model is just as effective and usually at a lower cost.

• Organization are now embracing “Data as a Service” …DaaS.
What to Keep Close, What to Let Go

- Any Geospatial data that is not core to your business should be done as a service:
  - Base imagery
  - Base Terrain
  - Feature data

- Time critical data that you need but don’t have the expertise or the manpower to keep up to date (also includes non geospatial data like tax code, titles, census etc.)

- Data that is of significant size and not critical to running your business

- Data as service providers do have the means to secure your private data and allow you to create mashed up maps and extract other information from it

- Keep: Result of your analysis on the data that is core to your businesses
Analytics
SGM Model choosen
Valtus Data and APOLLO Processing…

5 Band Data

Produces very clean change detection
UAS data - capture to OGC served
ORTHO’s - automatically

DYNAMIC GIS USE CASE
Basis for valuable information
From Image to Information

Basic data
image data with geoinformation
From Image to Information

Basic data
image data with geoinformation

Basic services
basic data as standardized web services
From data capture to information

Capture

Process
Manage
- AT
- DSM
- Ortho
- Mosaic
- Compression
- 3D objects
- Change
- Metadata
- Catalogue

Use
Share

The GEOSYSTEMS Workflow-Manager combines neat less various functions of standard products e.g. of the ERDAS family from Hexagon Geospatial
Universal UAV-workflow
integrated into IMAGINE Spatial Modeler
Universal UAV-workflow
Photoscan Functions integrated into Spatial Modeler

- **Producer's view**

* Based on Agisoft PhotoScan functions
Universal UAV-workflow
Photoscan Functions integrated into Spatial Modeler

- User's view

* Based on Agisoft PhotoScan functions
Universal UAV-workflow - Photoscan Functions and connection to APOLLO integrated into Spatial Modeler

- This is a real cloud-ready solution!
Hexagons vision by support of GEOSYSTEMS
Data capture with Aibot X6
Digital surface model
Ready to use ortho mosaic
In detail: Orthomosaic
Web service – fast, universal, global accessible
Web service – fast, universal, global accessible
THE REAL VALUE – FULLY-AUTOMATED PROCESSING CHAIN
FROM IMAGE TO DISTRIBUTED INFORMATION

Near-real time workflow for time critical applications
GEOSYSTEMS motivation: the SELSAS project
High-end multisensory platform – system configuration

OMCoSS*
OHB Multimission Communication & Surveillance System

- flight platform CONDOR
- state of the art sensors
- data link system ARDS

*https://www.ohb-system.de/omcoss-english.html
GEOSYSTEMS motivation: the SELSAS project
High-end multisensory platform – system configuration
GEOSYSTEMS motivation: the SELSAS project
High-end multisensory platform – system configuration

Capture
- Recording multisensor
- downlink real time

Process
- Data preprocessing
  - Georeferencing
  - Mosaicing
- Manage

Use
- Share
- Remote data processing and interpretation
  - Web-Client
  - WPS
- Local analysis
  - Direct file access

Geo-data server

1 sec/image from capture to webservice
Near-real time workflow for time critical applications

Scenario: fictive Evacuation of an embassy
Real-time information for an effective operational picture
Near-real time workflow for time critical applications

- High quality GPS/IMU
- No additional GCPs
- Near real-time processing
- 1 sec/image from capture to webservice
SELSAS – System test in a multiuser environment

Interaction of all forces, inclusively highly effective operational picture

Real-time situation awareness image

Consumption of UAV- webservice in other emergency products

Die Botschaft der Bundesrepublik im Kaiserreich Bayern ist ein umkämpftes Fleckchen Erde, wie Gottfried Seemann (rechts) und Matthias Baier in der Präsentation des ZINS zeigen. Doch mithilfe der vernetzten Kommunikation aller Kräfte können die Franken schließlich evakuiert werden. Zu sehen sind alle Einzelheiten der Operation auf der
The UAS-business modell – ready-to-go

1. Service provider: From capture to delivery: Capture – process – manage

2. Hosting provider: pay per image/pixel/hit: Process - manage
Through a combination of advanced solutions, Hexagon is able to provide a complete picture of the health of critical water infrastructure like dams, levees and reservoirs.
H₂O SCANNING & MONITORING
H\textsuperscript{2}O DASHBOARD
H₂O MOBILE
H₂O EMERGENCY OPERATIONS CENTER
H2O Emergency Action Planning & Response

EMERGENCY ACTION PLANNING & RESPONSE
Asset & Resource Management, Multi-Agency Coordination
H2O Emergency Operations Center

- Shelter Areas
- Assembly point
- Rescue units
- Evacuation routes
- Traffic control point
- Points of Interest
- Evacuation Area

[Map Image showing various points of interest and evacuation routes]

LEICA Geosystems
INTERGRAPH

HEXAGON SOLUTIONS
A constant flow of information fuses the Real World (as is/as built) with the Digital World (as planned/as designed).
THANK YOU