

# SAP HANA Spatial

## Location-based business platform

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PUBLIC

**SAP** Run Simple



# SAP HANA Architecture

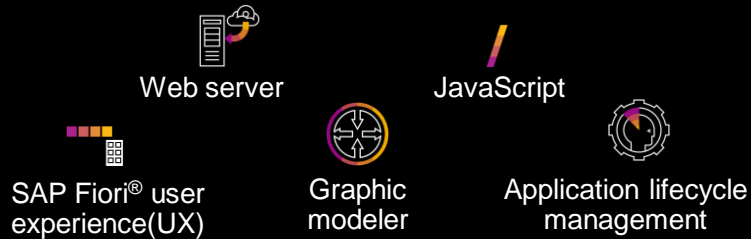
All Devices

SAP, ISV and Custom Applications

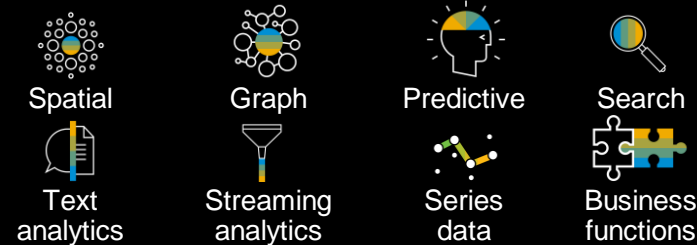
## SAP HANA® Platform

On premise | Cloud

### Application development



### Advanced analytical processing



### Data integration and quality



### Database management



ONE Open Platform

OLTP + OLAP

ONE Copy of the Data

# SAP HANA Spatial

## Solution overview



Business Applications



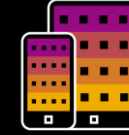
Analytics



GIS



Advanced Applications



Mobile

SAP HANA & Esri

Harness the Power of Location through ArcGIS with SAP HANA



### Spatial Data Types

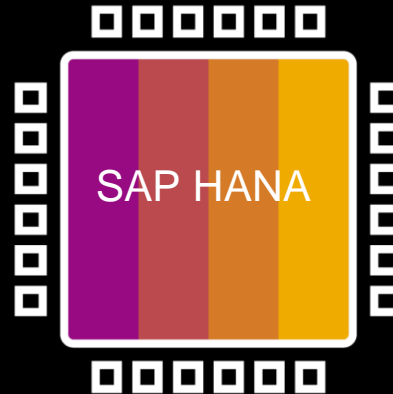
Natively store 2D, 3D and 4D vector data types (x, y, z, m)

### Spatial Functions

Over 80 native SQL based geospatial functions

### Spatial Content

Geospatial content including administrative boundaries and postal codes, SHINE starter content



### Mapping Services

Mapping API delivered; open to any mapping service

### Application Services

Quickly develop and deploy custom geospatial solutions

### Geocoding & Integration Services

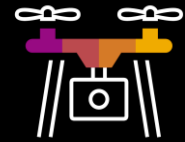
Ability to geocode, cleanse, merge, and provision data

**Native support of spatial data types, storage, processing, analysis, and services**

# Geospatial Technologies

## Key drivers for business decisions

- Rapid development of geospatial technologies in recent years
- Enables new ways of collection and analysis of geo- and business data
  - Remote Sensing
  - Satellite Navigation (GPS, Galileo, ...)
  - Unmanned Aerial Vehicle
  - Sensors
  - Geo Enrichment
  - Geographic Information System
  - Information technologies (database)
  - Geo-ML (GPU)



# SAP HANA Spatial

Reveal a new dimension of your business data

## HANA Spatial Engine

- Geodatabase
- Advanced geo-analytics
- Performance

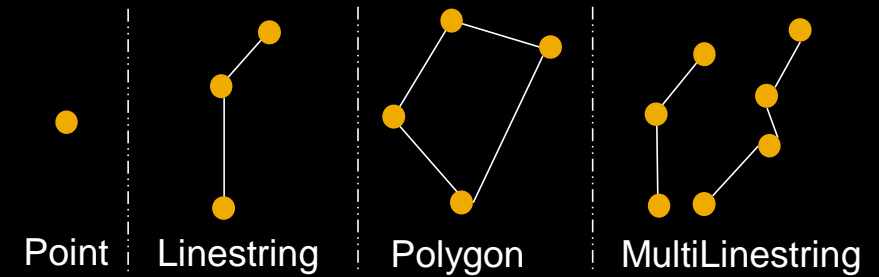
## HANA Earth Observation Service

- Raster analytics

## HANA Spatial Services

- Spatial & graph services (micro-services architecture)
- Based on open and commercial geo-referenced and connected data
- Exploring the world of spatial and connected data

### Vector Data



### Raster Data



### Drone Data







# Earth Observation Service



# Demand for Spatial and Earth Observation (EO) data

## SAP Industries

Life Science      Travel and transportation

Aerospace and Defense      Automotive      Banking      Chemicals

Consumer Products      Defense and Security      Healthcare

Media      Insurance      Engineering, Construction, and Operations

Mining      Higher Education and Research      Mill products      High Tech

Oil and Gas      Public Sector      Wholesale Distribution

Professional Services      Retail      Telecommunications

Sports and Entertainment      Utilities

Industrial Machinery and Components

# Key Challenge with Earth Observation Data

## Earth Observation Analysis

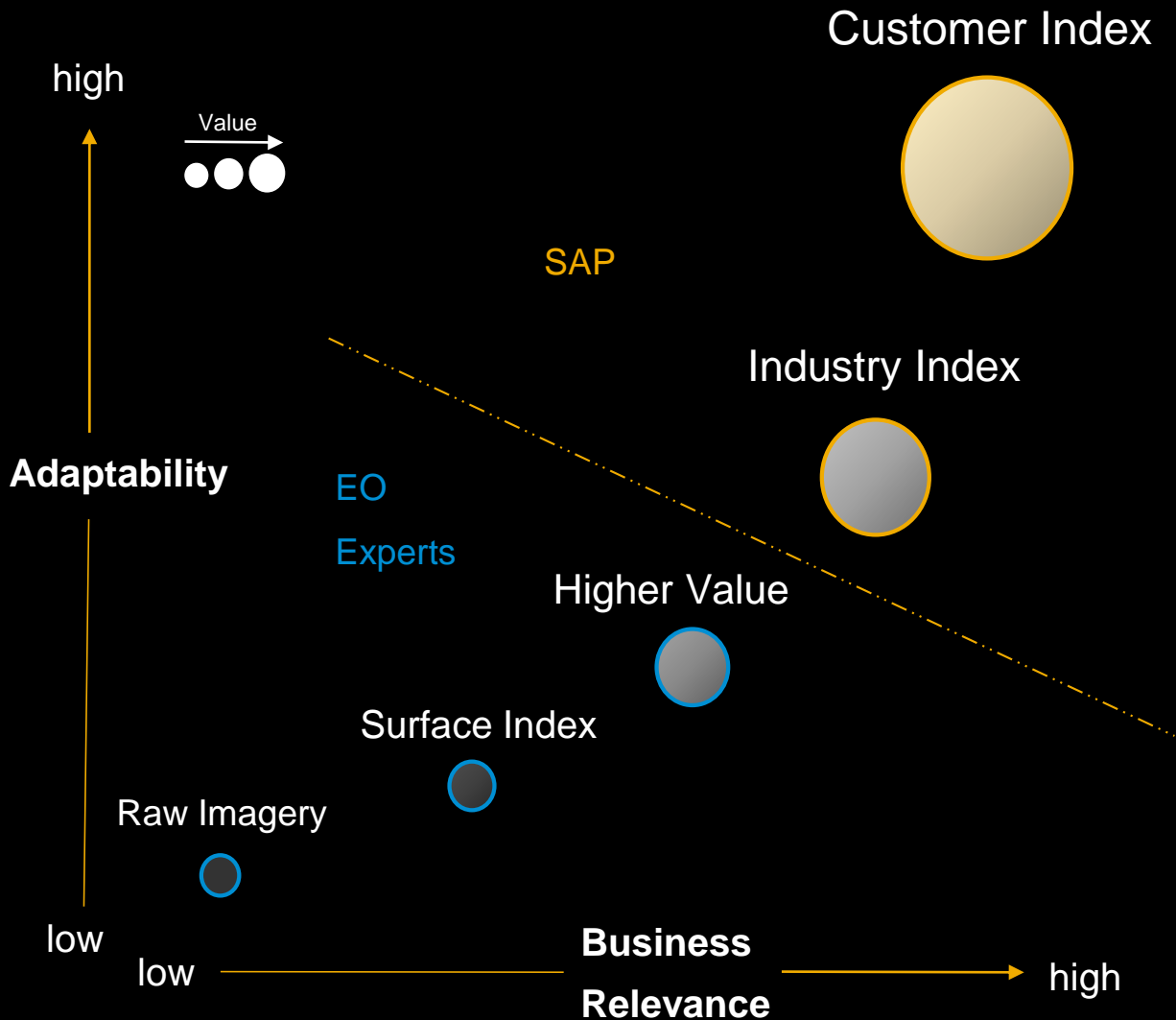
- Big data leads to IT complexity
- Understanding EO data
- Extracting valuable information
- Expert knowledge required
- Image processing and performance
- Harmonize, correct and correlate information





# SAP HANA Spatial Services

## Earth Observation Processing



### Customer index (L5)

Specific customer value index (correlation with business data)

### Industry index (L4)

Retail-, insurance-, agriculture-, smartcity-, climate-index

### Land cover / usage classification and change detection (L3)

Change-, alert- and forecasting systems with classification

### Spectral Indices (L2)

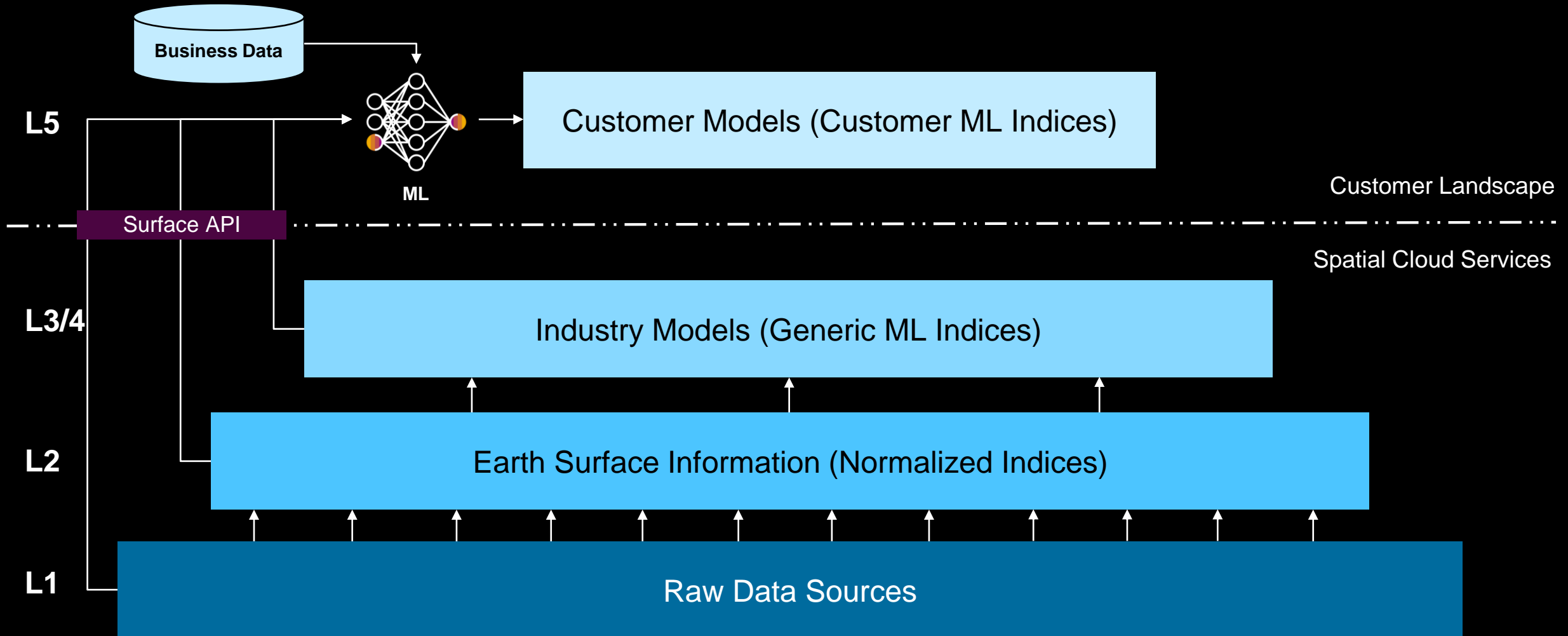
NDVI, NDWI, NDSI, NBR, VARI, LAI, FAPAR, DMP, BA, ...

### Raw imagery (L1)

Targeting EO specialist, researchers, and developers

# Value Chain of Spatial Services

From raw location data to golden business information





# Landslide Risk Prediction

## Model inference

### Prediction system based on

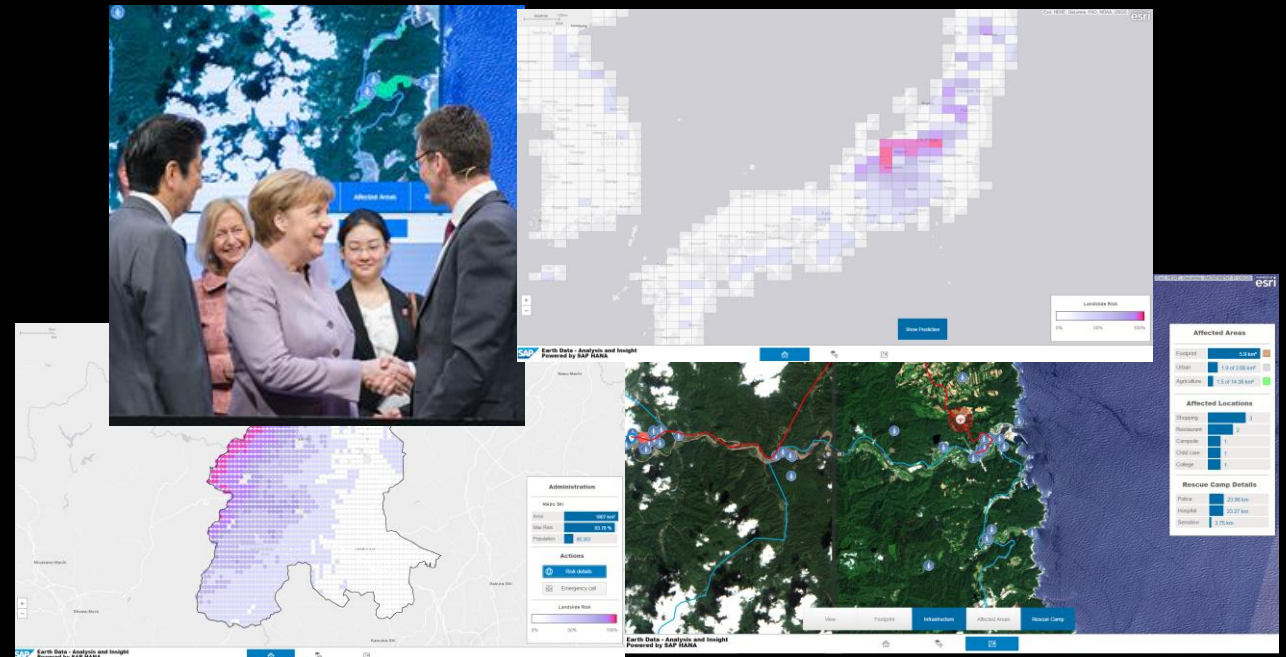
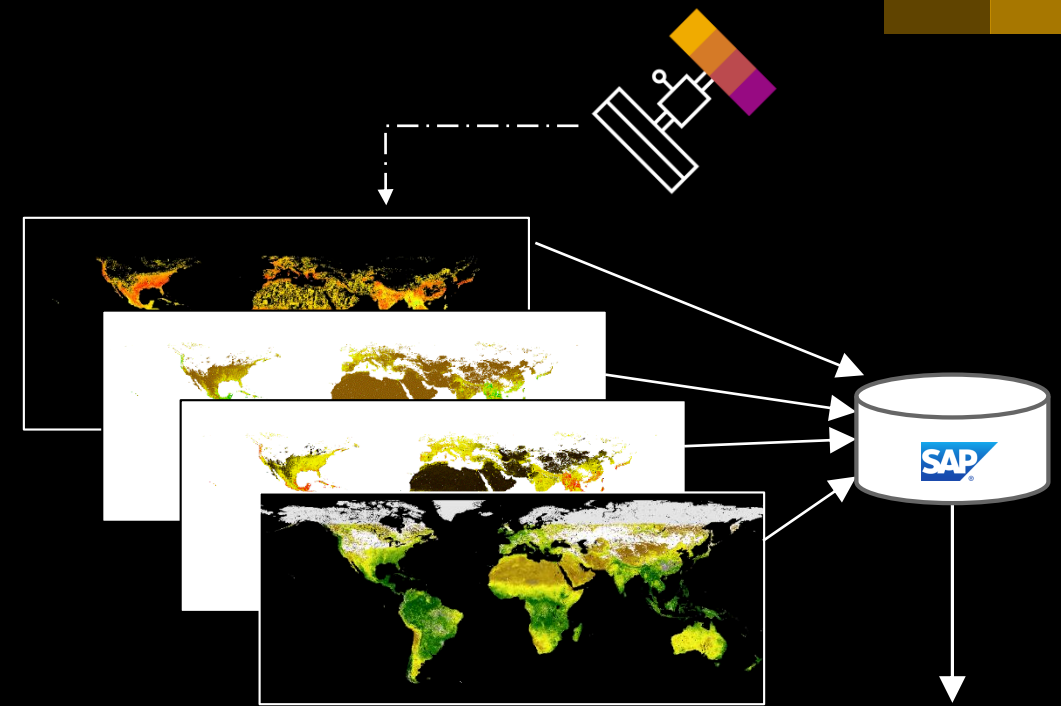
- Radar and optical EO data with gridded data
- Supervised deep learning (CNN, LSTM)

### Application

- SAP Cloud Platform service
- SAP HANA advanced analytics (spatial & graph)
- Combination of EO-, open- and weather-data

### Save lives and optimize rescue management

- Risk forecast for the next ten days
- Detailed emergency reports
- Improved decision making (emergency call)
- Reduce risk for humanitarian disaster



# HANA Spatial Services

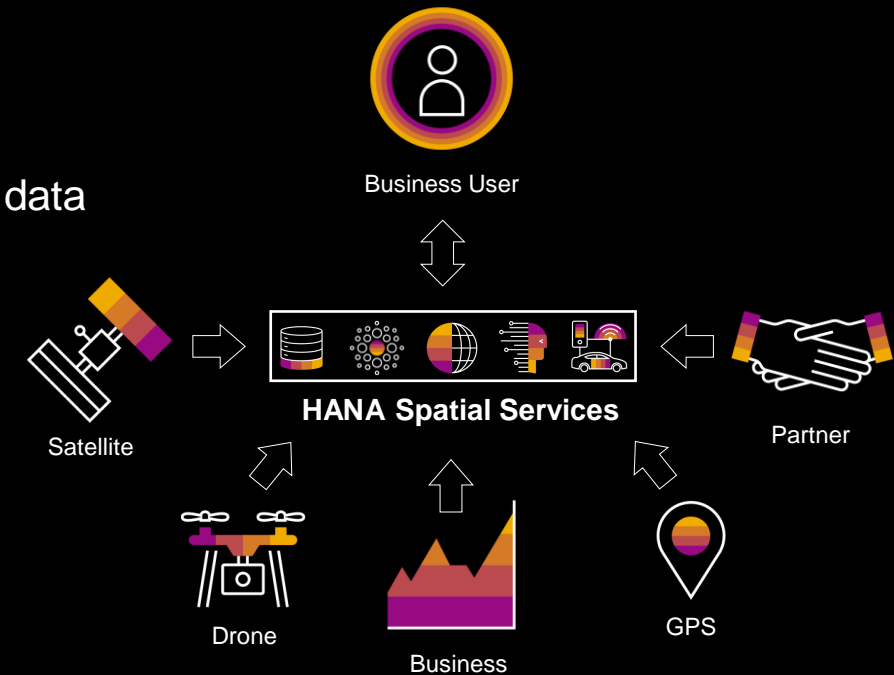
## Vision - Overview

The only business-ready spatial data platform

- Transparent combination of business and spatial data
- Establish locational data and services across all business processes
- Provide optimized industry solutions based on unified spatial and connected data
- Build an open and extendable ecosystem
- Combining sustainable development and business goals
- Reduced complexity, minimized costs, fast response to emerging trends

Open Spatial Platform leveraging HANA Spatial, Graph and ML

- Continuous data collection and information extraction
- Closing the gap between earth observation experts and business decision makers
- Seamless partner integration of location-based services, geo-referenced data, and expert extensions
- Unique industry and customer models based on spatial and business data
- Intelligent spatial services based on SAP HANA and supervised learning models





# Thank you

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