CLOUDEO

Access economy for GeoServices

"Rather than assets managed by centralised organisations we have ecosystems managed by platforms. Capabilities are no longer determined by what you own or control but by what you can access."

Greg Satell (2015) of Digital Tonto on "Access Economy"

CloudEO – the next generation GeoServices ecosystem

- **Founded by Dr. Manfred Krischke,** industry expert, raised $150m as founder & CEO of RapidEye
- **Unique and independent ecosystem** enabling a broad spectrum of GeoServices without owning satellites & GeoData
- **Consolidating GeoServices** by bringing together content, software, analytics and distribution on a universal platform
- **Seeking $5m of investment** to accelerate rapid growth, reach critical mass, broaden our services development and improving our platform

CloudEO's serves two significant markets

CloudEO's addressable markets

- CloudEO serves the **GeoServices market** which is expected to be **$270bn** by 2020
- Also, CloudEO addresses the **$8.5bn (2020) earth observation (EO) market**
- Growth drivers are: **Internet of Things (IoT), machine-to-machine (M2M), Smart Cities, Big Data Analytics**

GeoServices include:


Satellite navigation


Location-based search


Satellite imagery


Electronic maps

GeoServices' added value:


1.1bn hours of traveling time per year globally


Save **3.5bn litres** of gasoline per year


Global cost savings in agricultural irrigation per year of: **$8-22bn**


Total economic impact estimated at **$3 trillion** per year

Sources: Oxera report/ analysis; SpaceTec Partners; Euroconsult 2016, UN / United Nations Office for Disaster Risk Reduction

The overall economic impact of GeoServices is estimated at $3 trillion[1)] annually

Example industries & use cases

Logistics

- Optimizing routes
- Tracking fleet
- Maximizing efficiency

Agriculture

- Irrigation: estimated savings from $40 - $100 per hectare
- Improving yield while using less inputs like fertilizer, pesticides etc.

Marine

- Aquaculture and fisheries
- Protection of aquatic species & marine biodiversity
- Coastal protection
- Monitoring ecosystems

Forestry

- Providing a panoptic view of forest mapping and forest change mapping
- Monitoring illegal logging
- Identifying and monitoring forest fires in near real-time
- Cartographies of forest biophysical variables
- More sustainable forest management

Urban monitoring

- Risk management
- Environmental and health impact management
- City planning & detection and analysis of construction

Oil & Gas

- Exploration
- Environmental monitoring
- Risks of disasters
- Infrastructure construction

Insurance

- Risk modelling
- Loss assessment
- Index products

1) BCG report "The Geospatial Growth Engine"; represents revenues and saved costs

Today, the GeoServices market is legacy, complex and hardly accessible

Data production

- **GeoData is dispersedly produced** & provided by hundreds of different Geo-Services generators
- **Raw GeoData becoming commodity** (new satellites)
- **Satellite operators do not participate in downstream[1] value generation**

Processing / Distribution

- **Content expensive** and difficult to allocate
- **Raw data complex** to process
- **Expensive software and hardware**
- **Enormous upfront costs**
- **Slow time to market**

Utilisation / Adoption

- Predominantly affordable for **governments and large corporations**
- In general demand is **project driven**
- **Mismatch of price and value** to end customer

Stakeholders

Satellite operators, ground station operators	SW / HW processors, GI services, GeoConsultants	End-users, integrated end-users

1) Downstream market represents operations and services of GeoData

CloudEO's ecosystem disrupts the value chain by removing entry barriers

Data production

- **Economies of scale:** provide platform for higher commercial demand in order to increase output of data to **reduce cost of GeoData production**
- **Fair share in downstream value generation** while still achieving significant price reduction for data

Processing / Distribution

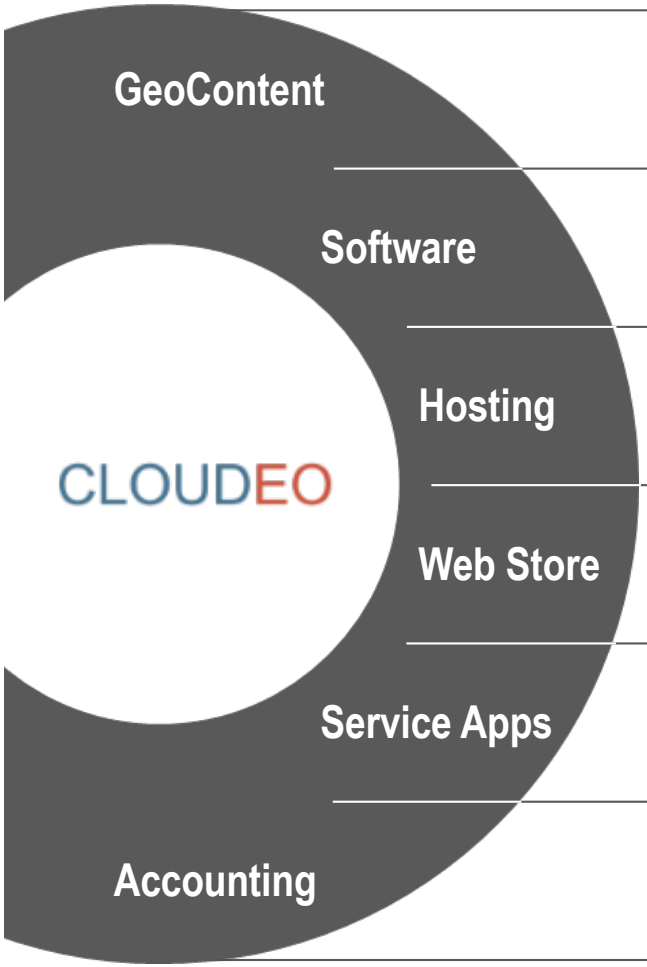
- **Data as a service / Software as a service:** content and technology on demand
- **Lowering entry barriers**
- **Create incubator / innovation platform** and make technology available for start-ups

Utilisation / Adoption

- Provide CloudEO's **toolbox, API's and marketplace** to end-users and service providers
- **Offer wide range of products** and services through app store
- **Address multiple billion dollar verticals, driven by evolving technology** (IoT, M2M, smart cities, big data analytics)
- **Create recurring demand**

CLOUDEO

CloudEO's provides a universal platform for multiple service providers



GeoData as a service (imagery, elevation, maps, GeoInformation)

Software as a service (tools, analytics, API's)

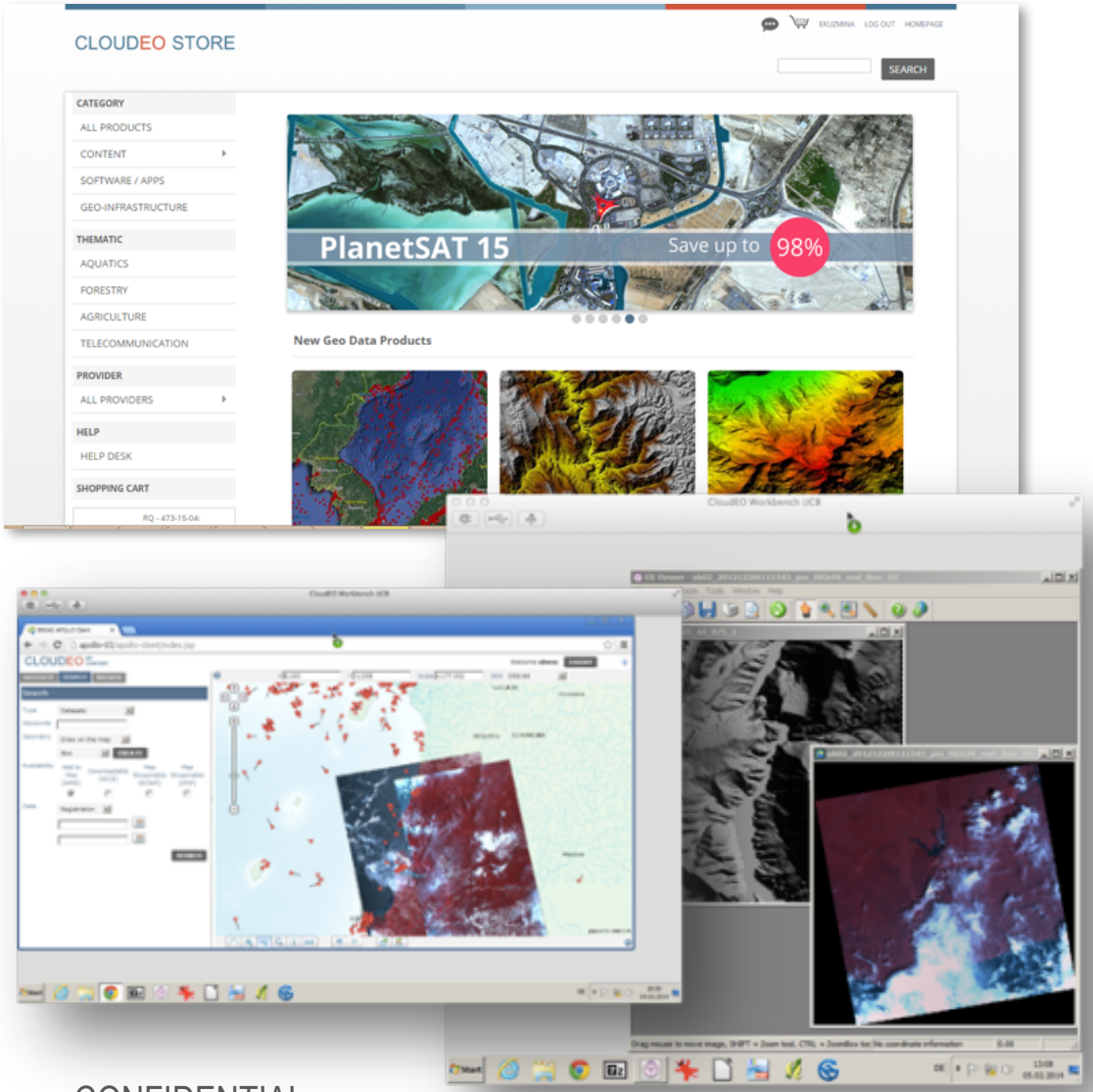
Network of clouds for maximum scalability and flexibility

One-stop marketplace for GeoServices

Ready-to-use GeoServices (easy to integrate in applications of many verticals)

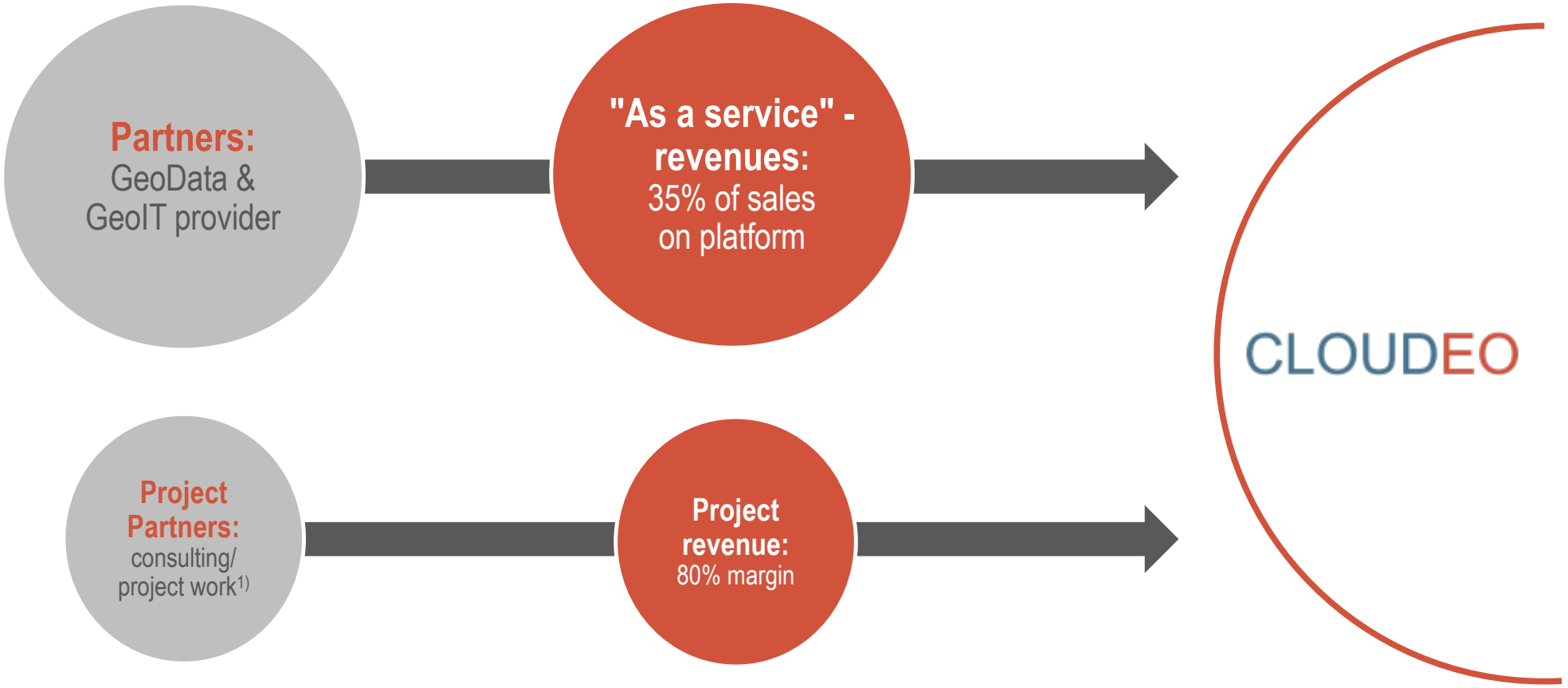
Customer and partner management

Built the platform and onboarded >80% of content providers and now ready to roll out



- http://store.cloudeo-ag.com
- Partners gravitating towards CloudEO
- Proof of Concept achieved with Intermap
- More than 50 service product groups available
- More than 100 collaborating companies

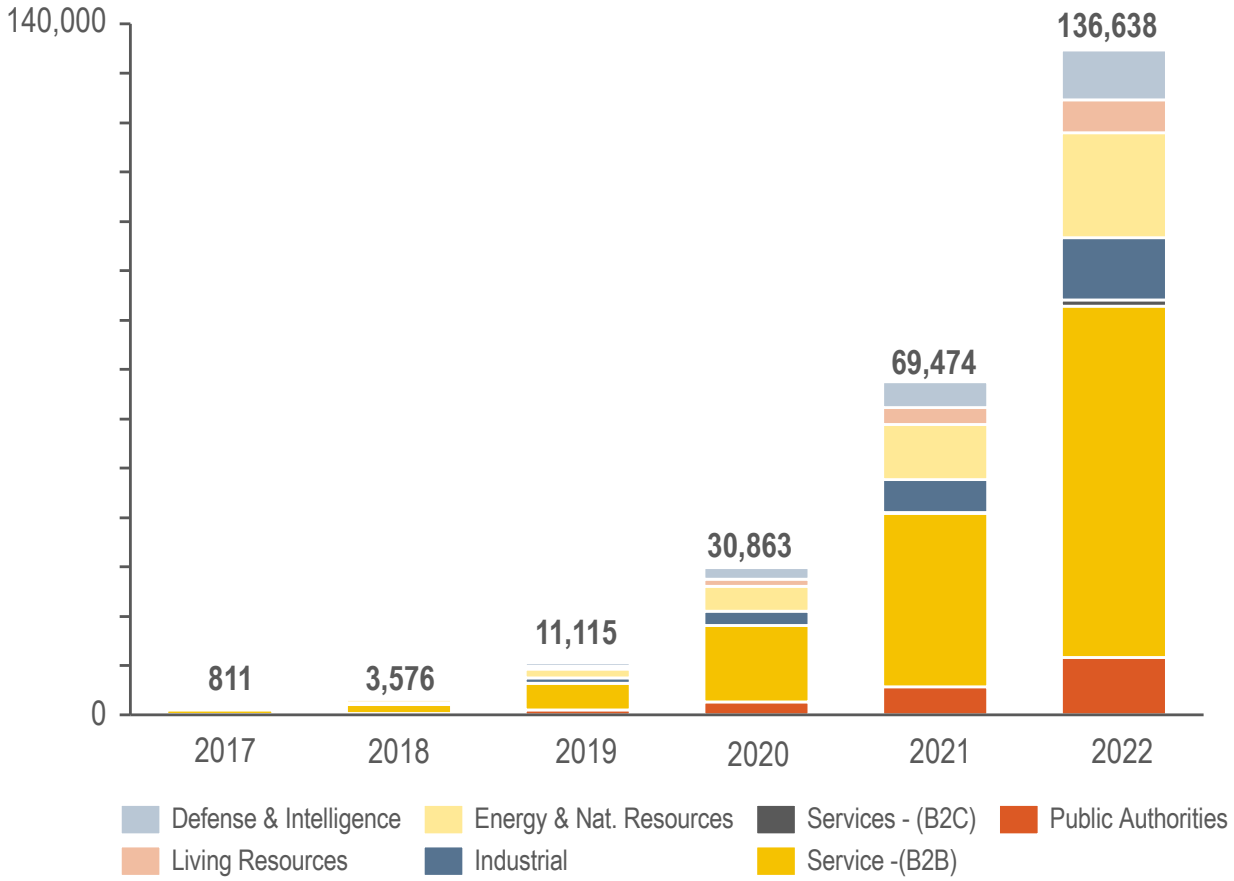
Generating transparent & recurring revenue sources



1) to develop platform and bring new applications

Pipeline offers growth potentials within key verticals

Revenue[1)] development by vertical (2017-2022) [in EUR '000]



Top 3 verticals in % (2017 vs 2022)

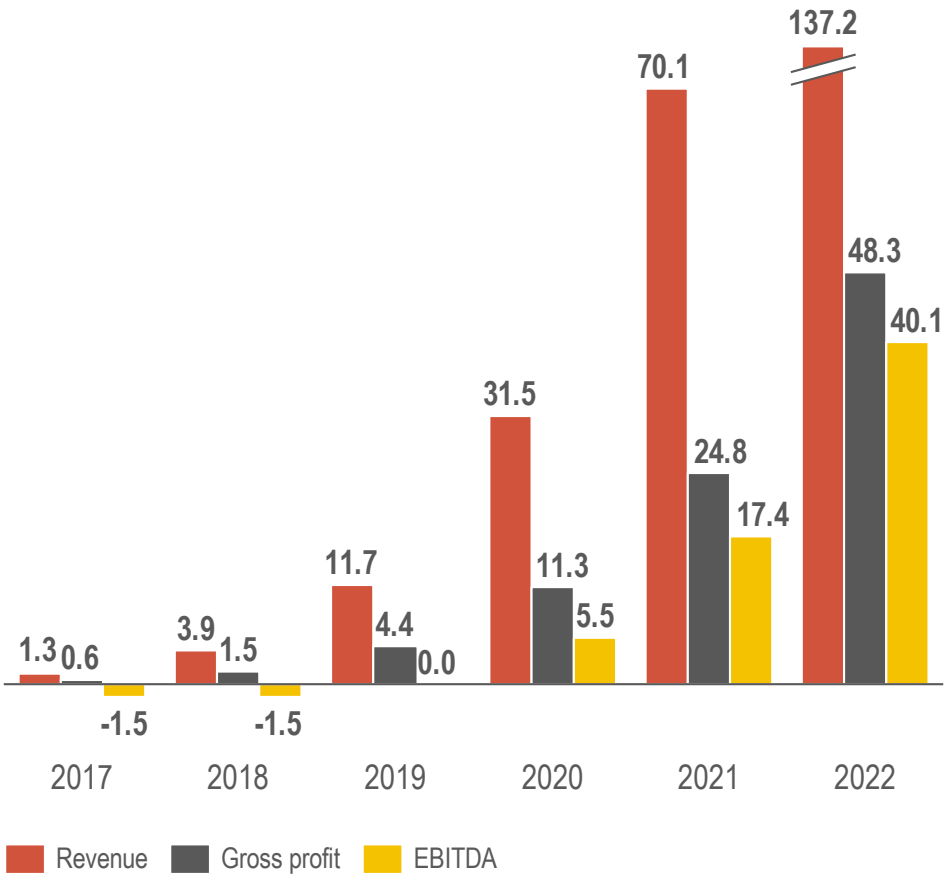
2017	[%]
Services (B2B)	85%
Public Authorities	9%
Living Resources	6%

2022	[%]
Services (B2B)	53%
Energy & Nat. Resources	16%
Industrial	9%

1) Excludes project revenues, service products & GeoIT as a Service

High-growth, scalable business model which enhances significant profits

P&L overview (2017-2022)



Key anticipations

- **Exponential growth of user base is driven by multiplier effects** of CloudEO's ecosystem:
  - Each successful application brings ten more applications on the platform
  - Each stakeholder in ecosystem brings additional sales resources
  - Incubator for start-ups with exponential business models
- **Expected CAGR of 154%** from 2017 – 2022
- High profitability: almost **25% EBITDA** margins in the mid-term

CloudEO expects a strong top-line growth from its data sales

in EUR	2017	2018	2019	2020	2021	2022
Data as a Service	811,750	3,576,900	11,115,800	30,863,205	69,474,845	136,638,401
Geo-IT aaS and Project Revenue	488,746	300,000	570,000	590,000	590,000	590,000
Revenue	**1,300,496**	**3,876,900**	**11,685,800**	**31,453,205**	**70,064,845**	**137,228,401**
Royalties (Cost of services)	570,875	2,324,985	7,225,270	20,061,083	45,158,649	88,814,961
Contracted services (Cost for Projects)	171,833	45,000	85,500	88,500	88,500	88,500
Total Cost of purchased services	**742,708**	**2,369,985**	**7,310,770**	**20,149,583**	**45,247,149**	**88,903,461**
Gross Profit	**557,788**	**1,506,915**	**4,375,030**	**11,303,622**	**24,817,696**	**48,324,940**
HR / Payroll[1)]	1,360,464	1,972,673	2,860,375	3,718,488	4,834,034	5,317,437
Rent	122,408	177,491	257,362	334,570	434,942	478,436
Communication + IT costs (server, HW)	147,950	214,528	311,066	404,385	525,701	578,271
Marketing + PR	232,742	337,475	489,339	636,141	826,983	909,682
Legal + Consulting fees	90,701	131,516	190,698	247,907	322,279	354,507
Travel Costs	128,000	185,600	269,120	349,856	454,813	500,294
Other costs	18,263	26,481	38,398	49,917	64,893	71,382
Total OPEX	**2,100,527**	**3.045,764**	**4,416,358**	**5,196,351**	**7,463,645**	**8,210,009**
EBITDA	**-1,542,739**	**-1,538,849**	**-41,328**	**6,107,271**	**17,354,051**	**40,114,931**

1) Sales headcount expenses included

Management has >50 years of experience within the space & technology industry

DR. MANFRED KRISCHKE

CO-FOUNDER AND CEO

- PhD in aerospace engineering
- Founder (1998) and CEO of RapidEye (now Planet)

DR. URSULA BENZ

COO

- PhD in electrical engineering
- Led the geo business of Definiens (now Trimble)

SASHA BOROVIK

CFO

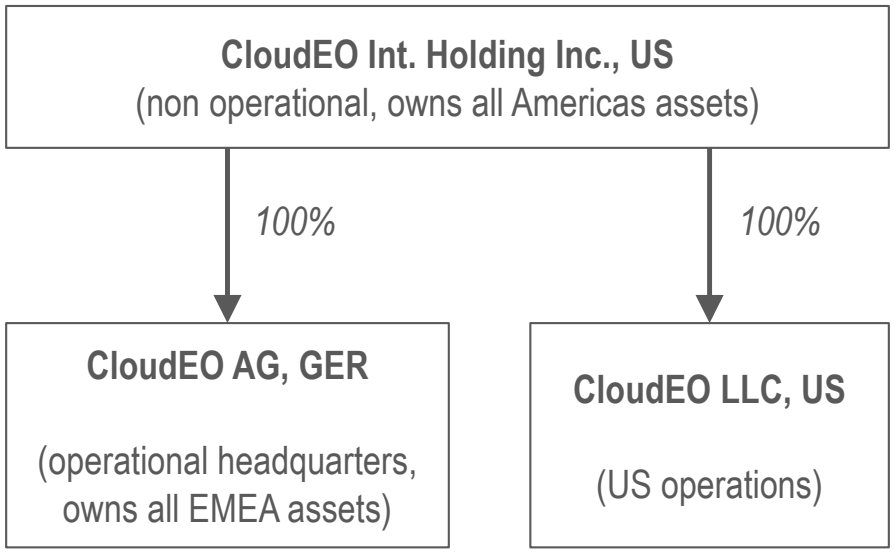
- LLM from Harvard Law School
- >15 years senior management experience in the technology industry (Akamai, Microsoft)

Prominent business angels led the seed financing round

Shareholder Structure of CloudEO Int. Holding Inc.

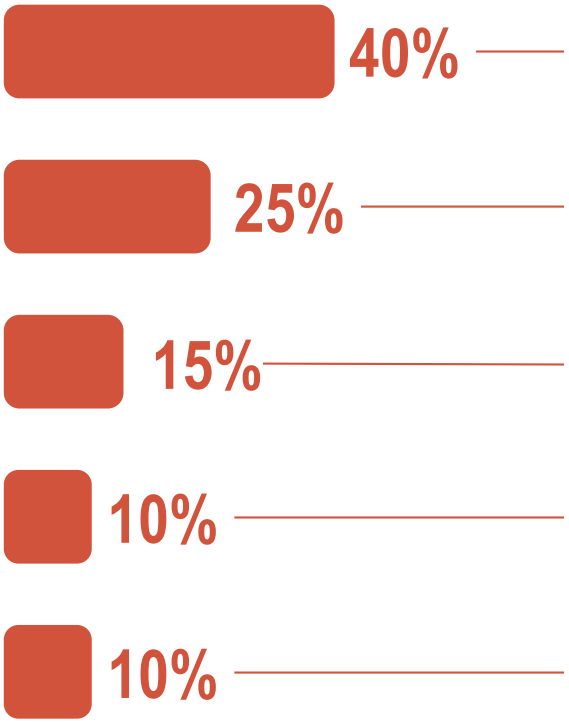
Shareholder	Equity (in %)
Scando (Dr. Manfred Krischke)	49%
EOversal (Peter Müller- Brühl)	17.8%
Vincent Dessard	9.8%
Dr. Harald Schwartz	7.9%
Apeiron (Christian Angermayer)	7.3%
Weintraub SA (Filip Weintraub)	4.3%
Dr. Ursula Benz	3.9%

CloudEO's corporate structure



Seeking a $5m investment to boost its sales & marketing activities

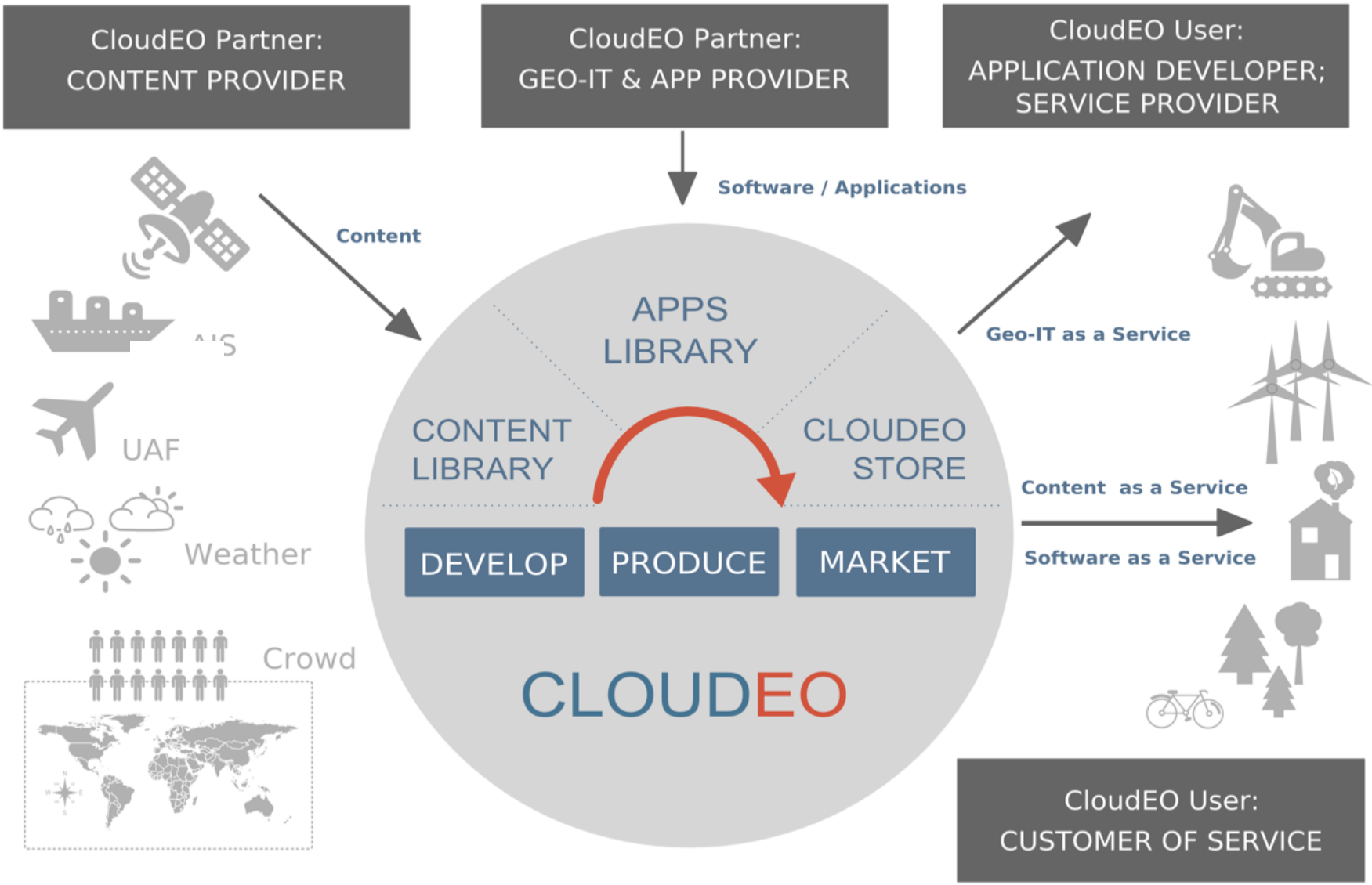
Use of proceeds



- **Strengthening** sales, marketing and support (e.g. team and strategic marketing
- **Improving** platform capability and automation
- **Active support and free offering** to start-ups to get them bounded
- **Extend** product marketing
- **Development of ecosystem incentives** (e.g. hackathons and service challenges)

APPENDIX

CloudEO's eco-system brings together the different stakeholders



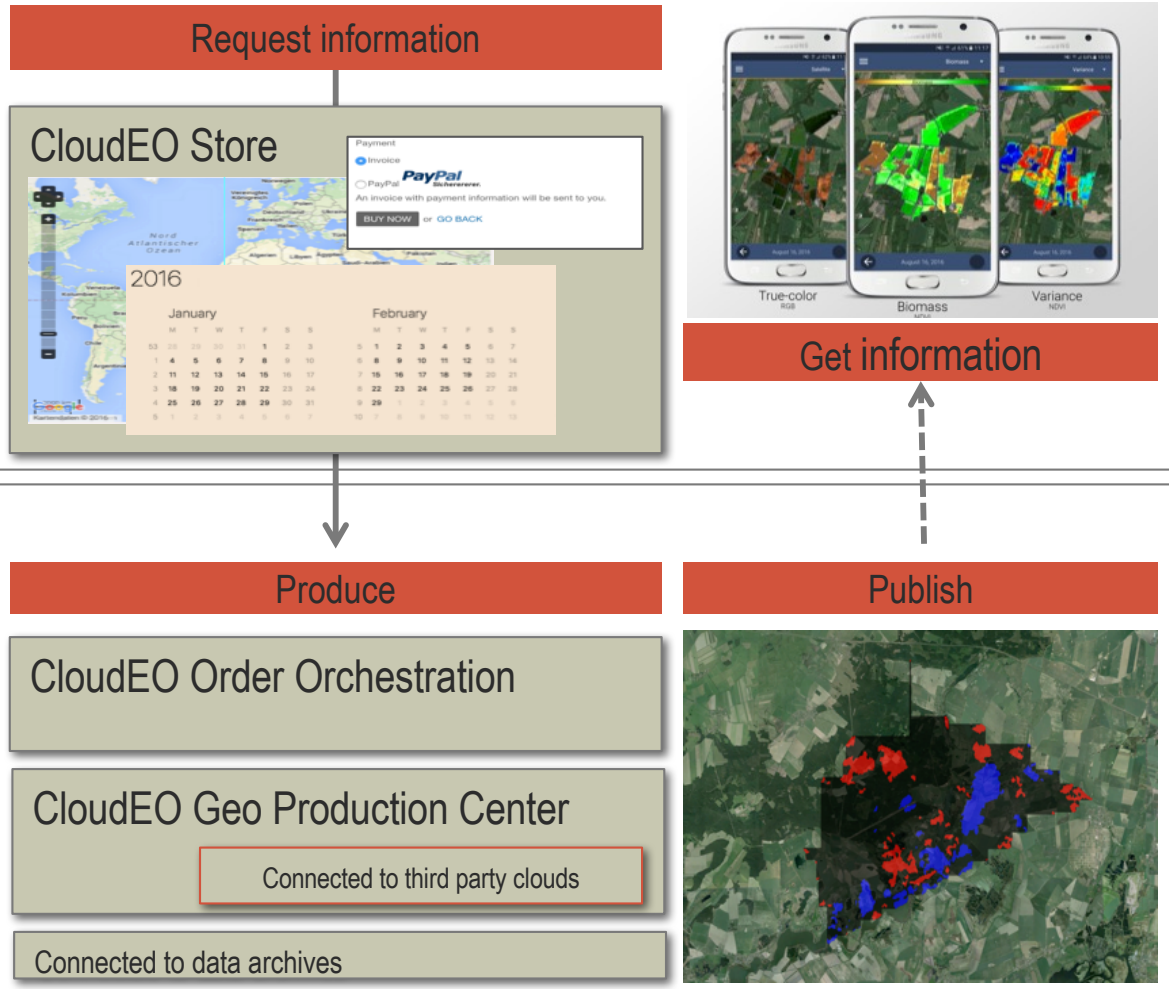
CloudEO marketplace consists of two main components

GEOspatial Store

- Multibrand
- Generic GeoServices - API
- Content, software, infrastructure, services
- Efficient webstreaming
- Comprehensive customer management
- Buy, rent, revenue sharing models

Toolbox, Production- and Orchestration System

- Easy API based Implementation of workflows
- flexible, scalable high-performance datacube analytics and fusion
- Hybrid cloud architecture (private and public)
- Developer finds everything to develop, produce and distribute his/her services
- Reusable, documented, scalable, secure



Potential of evolving technologies

Example industries & use cases

IoT

- Autonomous vehicles
- Smart wearables
- E-health
- Smart logistics/retail
- Social analysis

M2M

- Infrastructure maintenance
- Improved telecommunication
- Virtual infrastructure
- Connected home
- Inventory management

Smart cities

- City infrastructure planning
- Energy demand
- Real-time traffic speed information/transit visualization
- Security & surveillance

New industries & business cases for existing industries

- Big processing of big imagery data
- GIS moves to processing in the cloud
- Transaction oriented analytics: big processing of streaming spatial data

CloudEO is the only independent and comprehensive GeoServices ecosystem

	Service market-place	Processing Environ-ment	Data down-loadable	Data as a service	Software as a Service	Supplier Agnostic	Innovation platform / Incubator	Commer-cial Data	Open Data	Multi Cloud	Regional Gover-nance	Match making
CLOUDEO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mapmart			✓			✓		✓				
Airbus Geostore			✓					✓				
Apollo Mapping			✓	✓		✓		✓				
Hexagon	✓	✓			✓		✓					
ESRI ArcGIS	✓	✓	✓		✓							
Astro Digital			✓	✓			✓	✓	✓			
Urthecast	✓	✓	✓	✓			✓					
Open Data Incubator		✓	✓	✓					✓			
ESA Earth-Online			✓	✓			✓		✓			

Entry barriers & exit

High entry barriers

- First mover advantage leads to market domination
- Requires strong and established network with relevant stakeholders
- Complex downstream GeoServices value chain
- High switching costs for CloudEO's service providers

Exit scenarios – huge opportunity for GeoServices

- Possible exit through M&A ranging from traditional buyers to data-driven companies
- Estimated profitability profile allows IPO scenario

Service Example: Agriculture – Field Monitoring

Problem

Field monitoring for crop health

Conventional way

Farmers should visit every field

- Expensive
- Time-consuming

Digital way project based

Satellite imagery processing by experts

- Expensive
- Time-consuming

FieldSense

as a Service on CLOUDEO

+ Save money by reducing of fertilizers and pesticides
+ Save time by monitoring fields more efficiently
+ Increase profits by reducing losses due to undetected crop health issues

Service Example: Environment – Dredging Monitoring

Problem

Water depth should be measured during the dredging

Conventional way

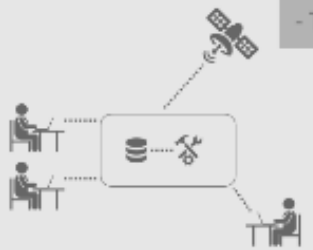
Visual control by experts from aircraft

- Expensive
- Time-consuming

Digital way project based

Satellite imagery processing by experts

- Expensive
- Time-consuming

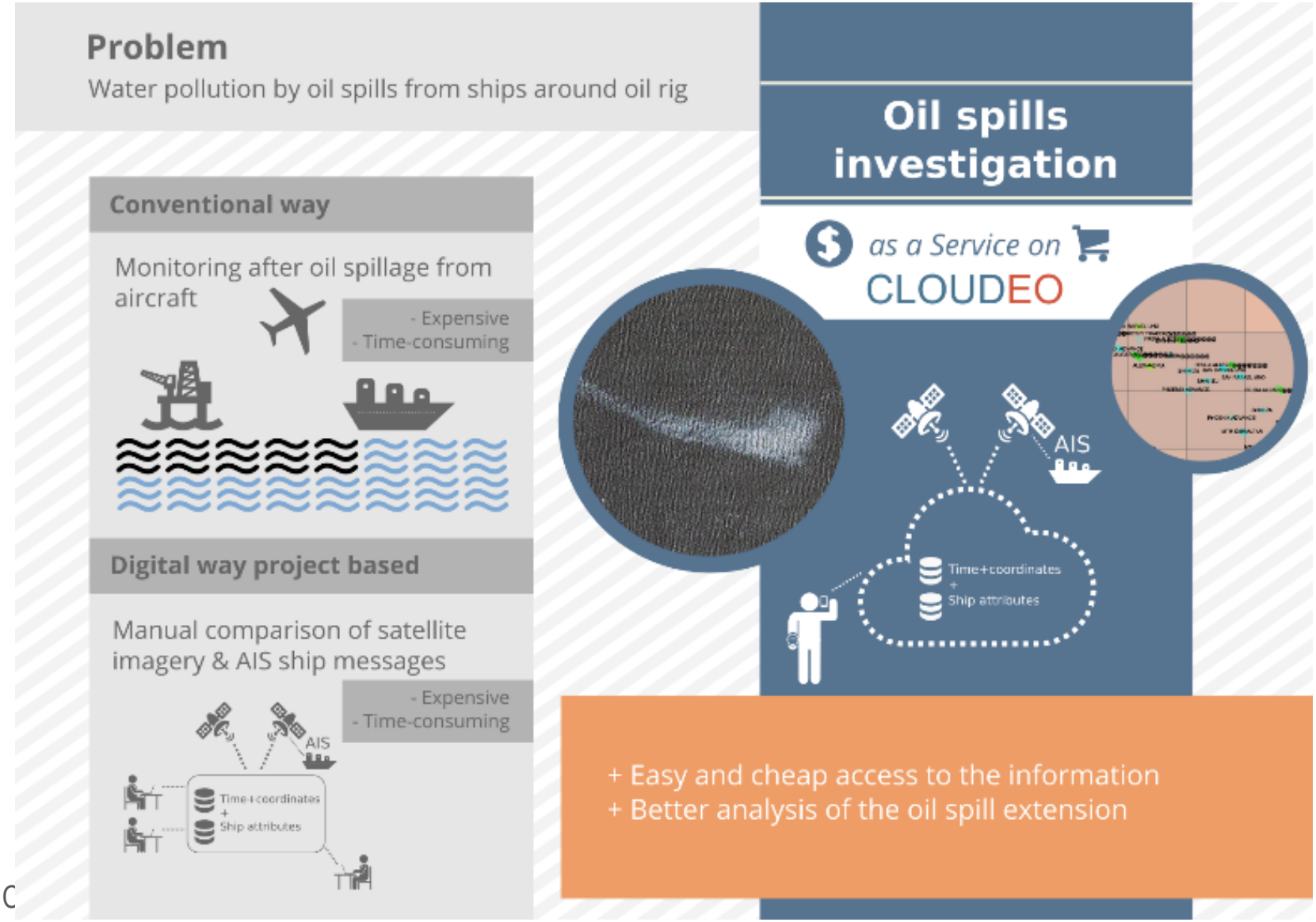


Satellite derived Bathymetry

as a Service on CLOUDEO

+ Rapid delivery of map (many times a day)
+ No observer subjectivity
+ Savings in labour, time & costs
+ Mapping in extensive and inaccessible areas
+ Relatively high accuracy till 15 m deep (2 m resolution)

Service Example: Oil Spills Investigation



Service Example: Telecommunication – Terrain Profiles

Problem

Definition of visibility between towers for network planning

Conventional way

Control by experts in the field

Cosly
Time-consuming

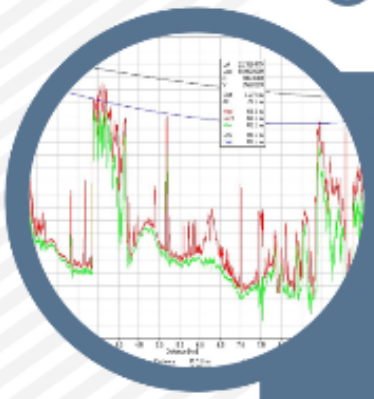
Digital way project based

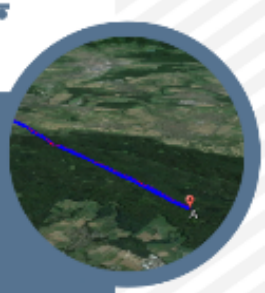
Processing based on DEM

Expensive data licenses

Terrain Profiles

as a Service on CLOUDEO





+ Ready to use
+ Experts get Line-Of-Sight within seconds
+ Saving millions for data licenses
+ Less travel costs
+ Time saving

Service Example: Subsidence Mapping

Problem

Subsidence causes damages of pipelines

Conventional way

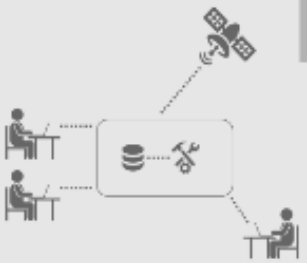
Measurements in the field with D-GPS

Less-dense
Costly

Digital way project based

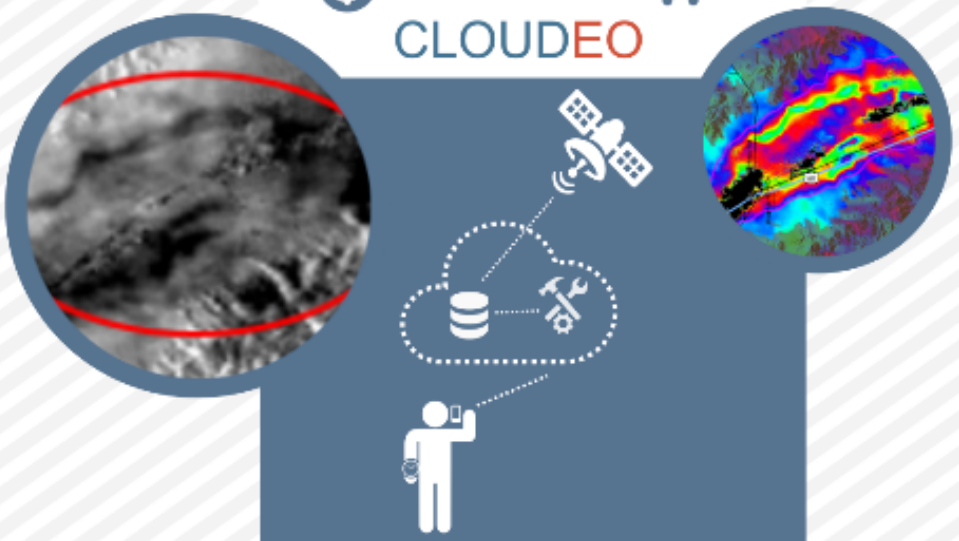
Measurements with Permanent Scatters (PS-InSAR)

Very expensive



D-InSAR

as a Service on CLOUDEO



+ Cost effective
+ Benefits for many small oil, gas and water production fields and subsurface mining
+ Less travel costs
+ Time saving

Service Example: Tourism / Environment – Water Quality Monitoring

Problem

Water quality monitoring information for authorities, tourism, oil, gas & fishing companies

Conventional way

Manual analysis provided by experts

Less-dense
Expensive

Digital way project based

Satellite imagery processing provided by experts

Expensive
Time-consuming

eoApp - Water Quality

as a Service on CLOUDEO

+ Rapid delivery of map
+ Worldwide available
+ Savings in labour, time & costs
+ Mapping in extensive and inaccessible areas
+ Benefits for authorities, oil, gas & fishing companies