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# EO<sub>21</sub>



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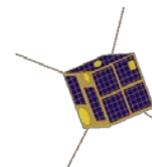
# Catapult Explained



Business Support



Programmes to unlock potential



Harnessing disruptive technology



# Indicator of Trends



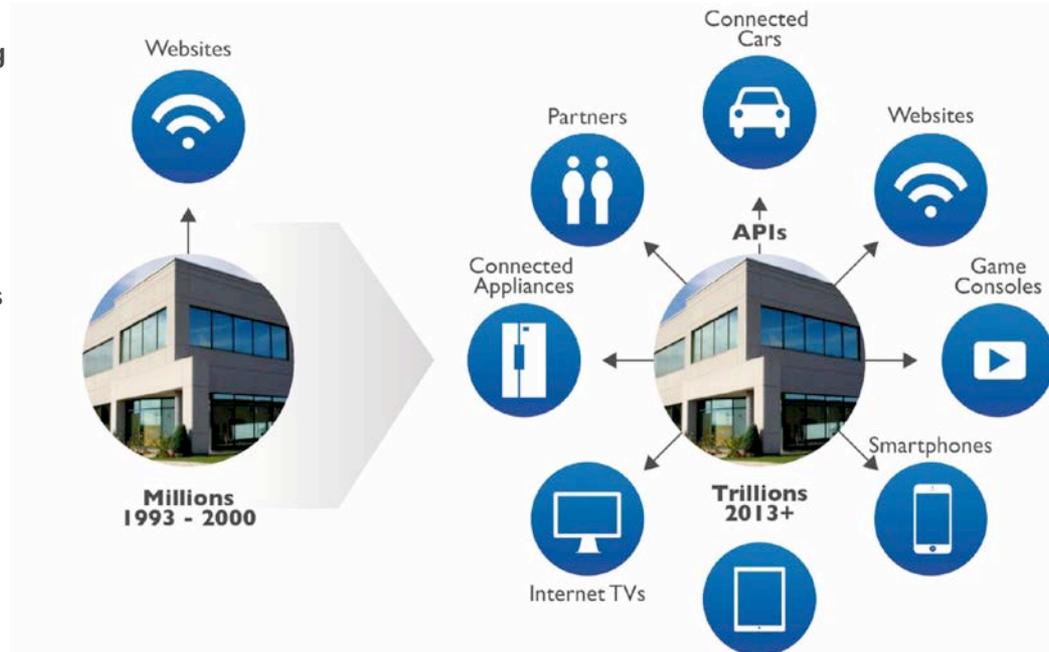
The EO industry, **part of the wider data economy**, is experiencing a number of factors that are driving change.

These include:

- The emergence of cloud computing
- the rise of data exploitation platforms
- interconnected terrestrial and space-borne systems
- diversification of business models
- open data policies.

*“Geospatial data is key to every business that there is, it’s a cross sector play.”*

Anthony O’Dowd, IBM Cloud Technologies, CTO Office



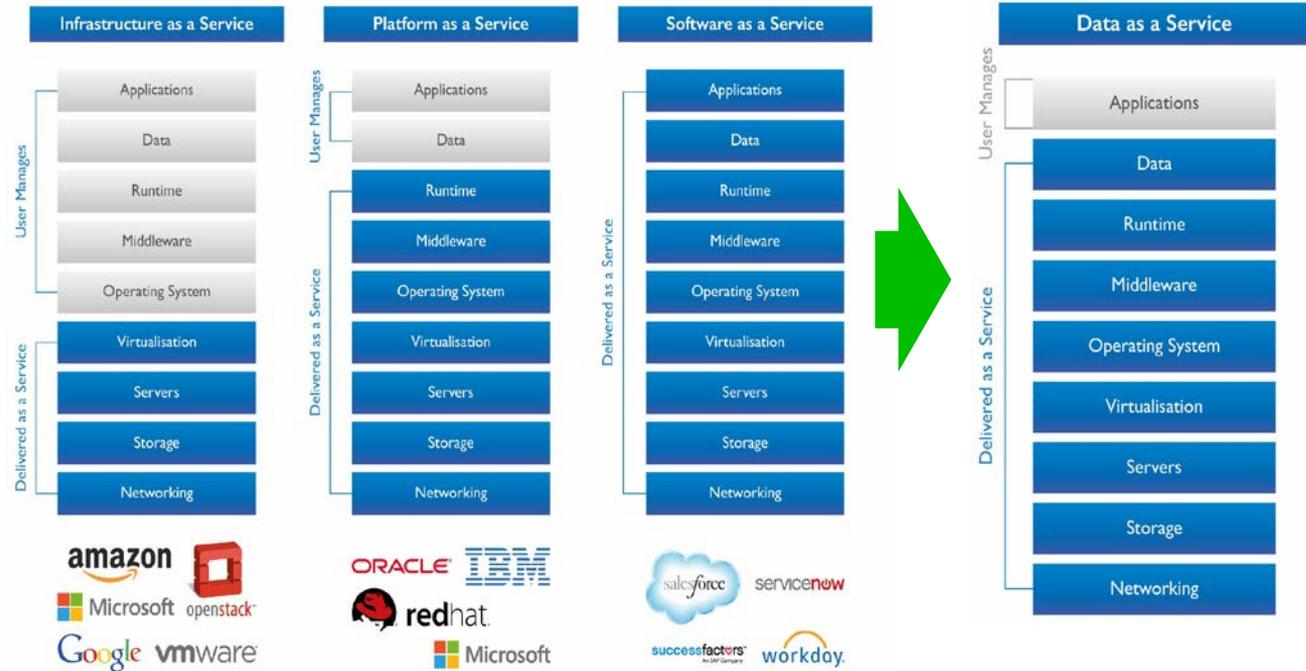
APIs are the fastest growing, business-influencing technology in the IT industry today. API’s are enabling more and more devices to connect. 300,000 are projected to be registered by 2020.

IBM Global Technology Outlook, 2013



# Indicator of Trends (continued)

**EO Data as a Service:** represents the enablement of regular, non-expert users to effectively take control of often highly complex and traditionally inaccessible IT tools.



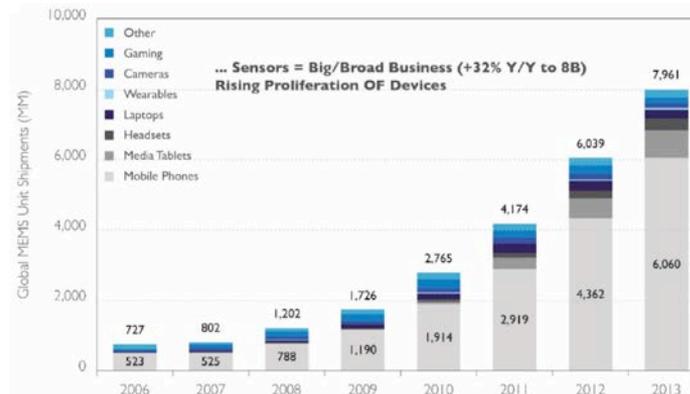
Source: Woodside Capital Partners (2014)

# Indicator of Trends (continued)

- Increasing value is created as data progresses through the value chain
- Cloud-based APIs, algorithms and thematic platforms aim to extract value
- Democratising data use will engage a wider user community, increasing the likelihood of stimulating new, disruptive innovations.



Source: Digital Catapult (2014)



Source: Kleiner Perkins Caufield Buyers (2014)

# 'ICT4EO' Alliance



**Mission:** Making the most of ICT to maximise the scientific, economic and societal value of data, in particular from Earth Observation.



Microsoft Research



*"Many customers from a lot of different industries need geo-data. The opportunity is to **build an EO ecosystem around the cloud**. There is a role for ESA to play in the usability of tools and ease of data exchange."*

*"Opportunity for distributing archived EO data to scientific community. Utilising computing power and storage capacity to solve this big data challenge. ESA has a role to play in creating standards and the curation of data."*

*"We see GIS and satellite data as a path to many different vertical markets, from defence and transportation to Earth science and climate modelling. A certain amount of stewardship is key for the EO industry to progress."*



# Foresight Report

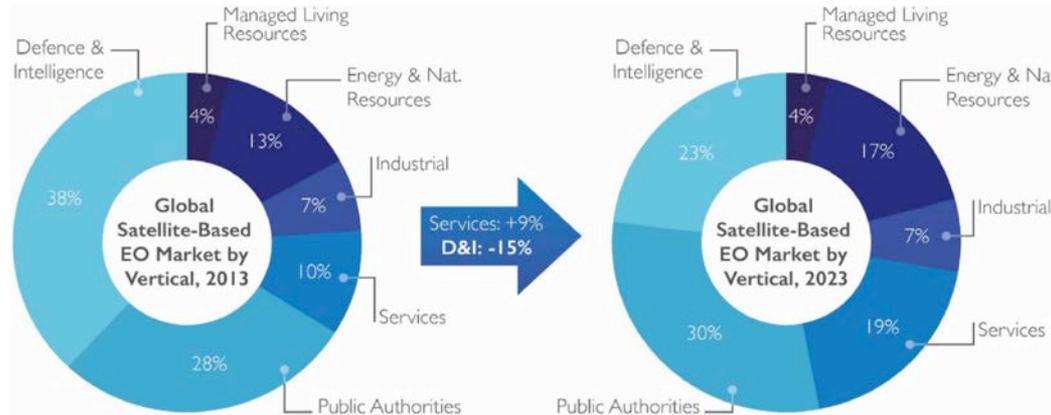


The information services segment of the EO value chain is due to grow the most over the next decade.

## Global Satellite-Based EO Market by Segment

€ Million	2008	2009	2010	2011	2012	2013	08-13
Data	€ 526	€ 642	€ 745	€ 793	€ 828	€ 758	7.6%
Value Added Products	€ 266	€ 284	€ 323	€ 351	€ 357	€ 339	5.0%
Information Services	€ 506	€ 573	€ 671	€ 767	€ 804	€ 842	10.7%
<b>Global</b>	<b>€ 1,297</b>	<b>€ 1,499</b>	<b>€ 1,739</b>	<b>€ 1,911</b>	<b>€ 1,990</b>	<b>€ 1,939</b>	<b>8.4%</b>

## Global Satellite-Based EO Market by Vertical, 2013-2023



Sources: Northern Sky Research (2014)  
Currency conversion from \$ @ 1.10



# Key Factors of Change



**Key drivers of change in the data economy, impacting the EO market are:**

- Open data policies
- Data as a Service
- Rise of the platforms
- Sensor use growth
- Crowdsourcing

**Key trends, determined as having the most potential for impact on the EO value chain, are:**

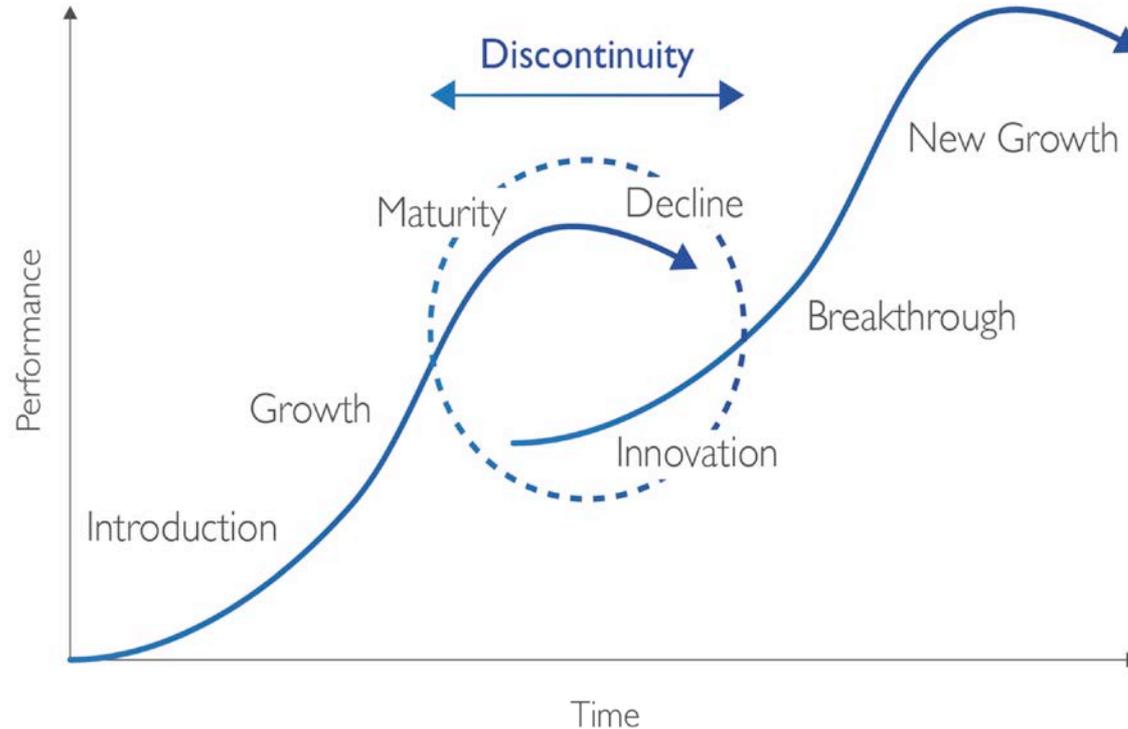
- Access to data and tools
- **Data source diversification**
- **Diversification of business models**
- Satellite capability improvement



# New Wave of Innovation



The **industry life cycle model** provides a useful framework to understand how industries evolve.

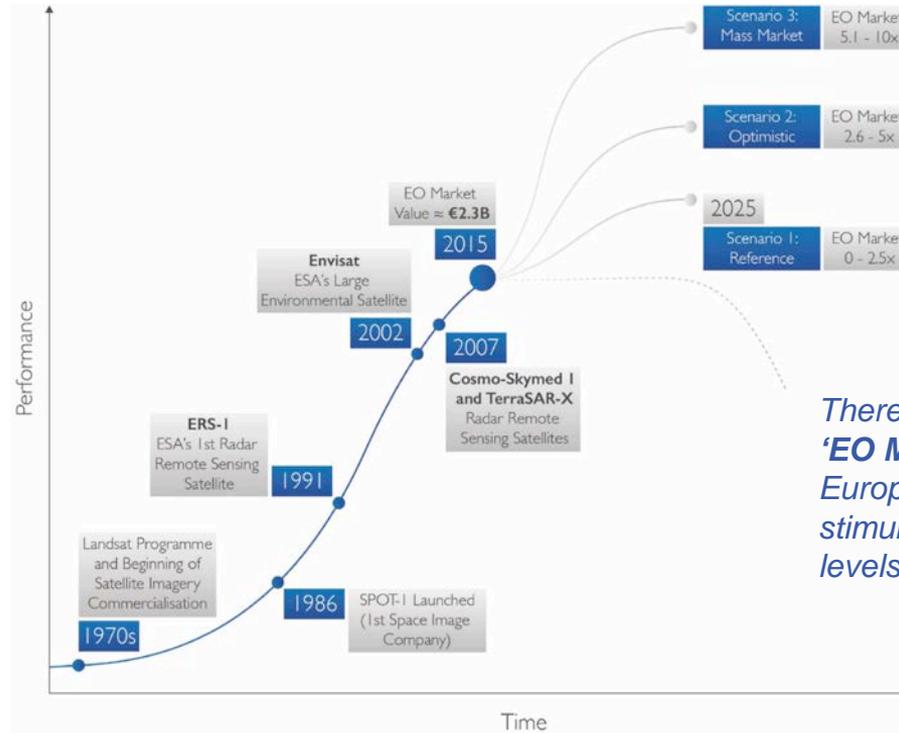


# Future Scenarios



**Future scenarios** show different rates and direction of development within the EO market.

Leveraging existing investment in on-demand IT infrastructure moves users closer to the data (“data gravity”).



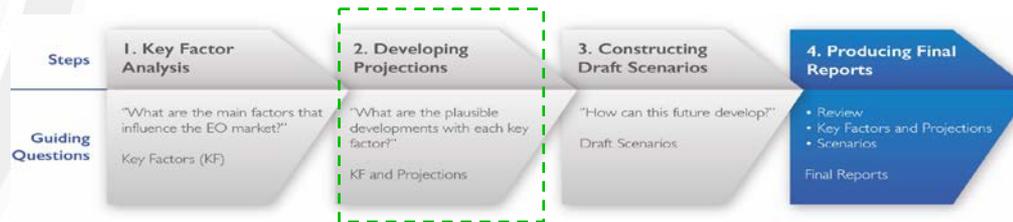
*There is a key role for ESA to play as ‘EO Mission Ambassador’ of a European EO marketplace, stimulating and supporting higher levels of growth*

Source: Satellite Applications Catapult (2015)



# Key Factor Projections

Scenario	Access to Data and Tools	Data Sources Diversifying	Diversification of Business Models	Satellite Capabilities Improving
Reference	Modest Application Growth	Limited Growth in Interconnected Systems	Modest Downstream Growth in Existing Verticals	Un-aided Innovation
Optimistic	New Enterprise Information Products	Modest Growth in Interconnected Systems	Downstream Growth from New Markets	Progressive Development
Mass Market	Consumerisation of EO Data	Proliferation of Interconnected Systems	Downstream Growth from Mass Consumer Uptake	Advanced Technologies Realised



Source: Satellite Applications Catapult (2015)

# Draft Conclusions

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Disruptive innovation will be driven by making EO products and services more accessible and affordable for a larger user base.

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The key factors of diversification of business models and data sources have the most impact on the EO value chain in all future scenarios.

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The European EO sector needs a neutral actor captaining the direction of the industry. There is a key role for ESA to play as **'Data Steward'** and **'Outreach and Community Builder'** (**'EO Mission Ambassador'**) of a European EO marketplace.

Leveraging existing IT infrastructure investment and making it easier to discover, access and process EO datasets.

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Access to on-demand, intuitive and multi mission, open source scientific toolboxes helps remove barriers to entry for non-EO app developers, connecting with a wider mass consumer market.

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Many stakeholders within the ICT4EO Alliance express a desire to engage more with ESA in supporting the growth of the European EO sector, using European resources.



# Support EO-Innovation Europe



## Develop

Mission Objectives, User Requirements and Mission Architecture

## Launch



Launch of Sentinel and other satellites

## Operate

Ground Segment, ICT Alliances, collaboration amongst multiple cloud providers

## Exploit

Open science and open innovation drives new growth



- Enabling European EO Marketplaces
- Developing libraries of cloud-based APIs
- Forming standards with industry
- Develop operating rules to protect IPR

- Identifying long-term scientific goals
- Curation of long-term archives
- Data validation for new data types
- Quality control of long-term data records

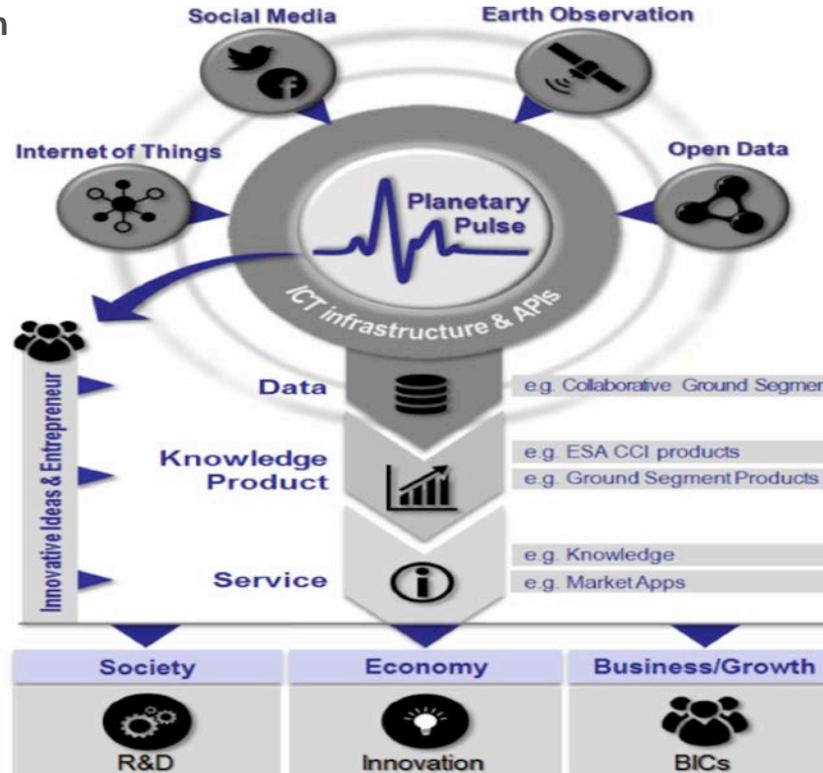
- Build and nurture communities
- Outreach to new users
- Develop partnerships with key users, e.g. via STEP community platform
- Facilitate industry alliances



# Earth Labs Initiative

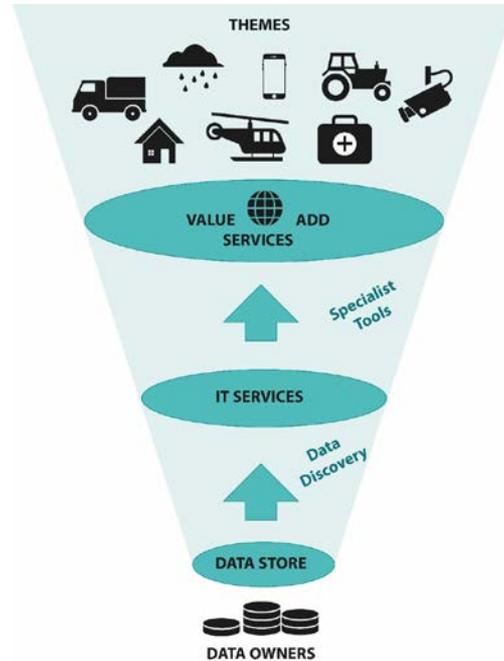


Aims to support **open innovation** ecosystems, maximising the scientific, economic and societal value of EO data.



# Cone of EO Value

Driving digital innovation and fuelling the data economy.



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