

# Federated Collaborative Platforms

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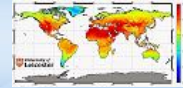
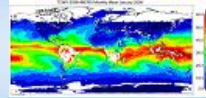
Guenther Landgraf, Data Applications Division  
Science, Applications & Climate Department

EO4Society Info Day  
9 March 2021



# The EO Ecosystem: the past

Exploitation  
Layer



Applications  
& Science

- ... Mission Ground Segments make data available for download
- ... Users process the data on their own infrastructures

Data Generation  
Layer

Ground Segment  
Infra-structure



ESA  
Heritage, Earth Explorer,  
Third party Operations



Copernicus Sentinels  
Operations



National/commercial  
Operations



# Digital Platform Economy: Citations

Erik Vermeulen, Professor of Business and Financial Law at Tilburg University:

*The future of the digital age will be platform-driven ecosystems in which multiple players participate. The most influential companies will be the ones that position themselves as "platform owners". Established and "traditional" companies must also make this transformation.*

***The rule is very simple: "You either become a platform or you will be killed by one."***

Haydn Shaughnessy, Author, Innovation Researcher and Fellow at the Centre for Digital Transformation, University of California:

*I see these as the essentials of a platform: Smart platforms don't follow a set of design rules. They are able to orchestrate strategy on the fly.*

***They restructure markets horizontally and they enable exponential growth. If a platform is not going to create substantial growth then something is wrong with the strategy.***

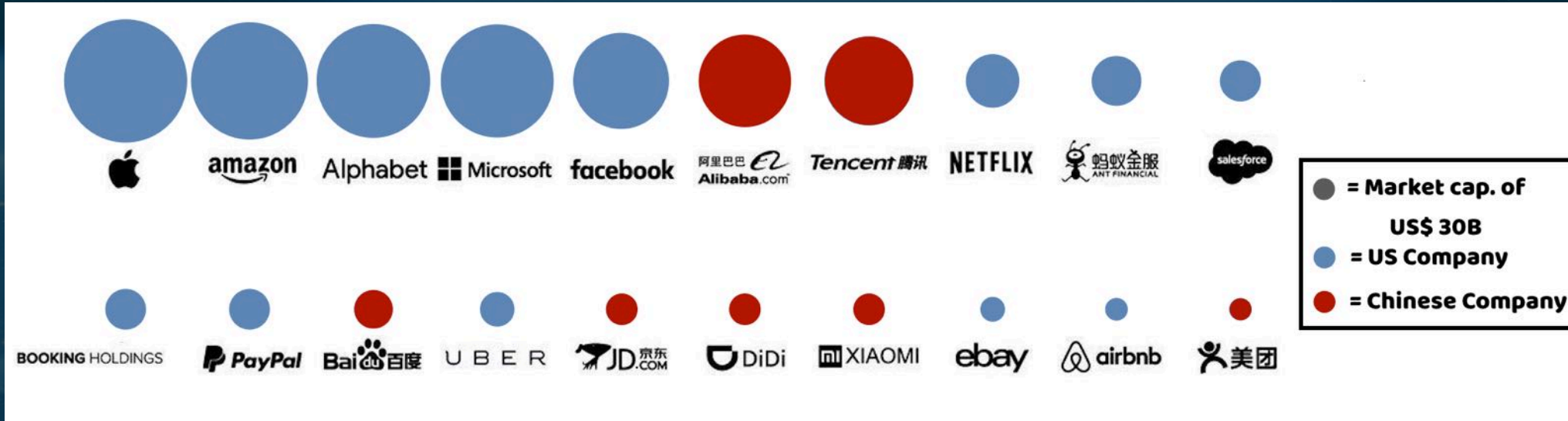
***Content is critical to platform development*** for without good content you have no advocacy and advocacy is perhaps the single most important gain from being in a globally connected network.

*Platforms are essentially seamless transaction engines exploiting micro-payments.*

***They also have a culture of restless technical innovation***



# The World's Largest Tech Giants



I. Tech giants are “platform companies” :

a. with a hybrid structure (Apple, Amazon) or

b. with an asset & employee light structure (Airbnb, Google).

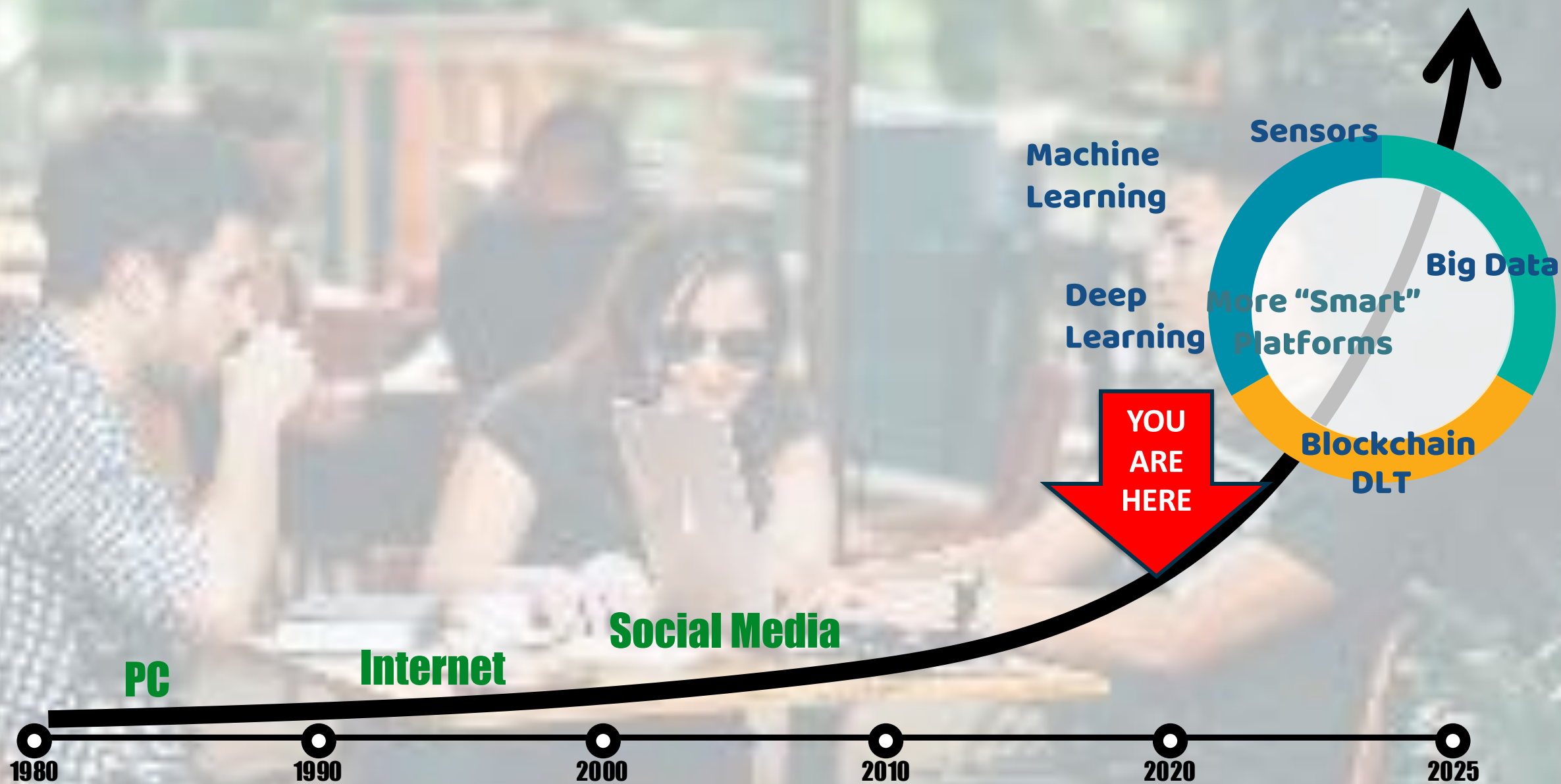
II. Dominated by US and Chinese companies:

“Europe should get much more serious about platforms.”

III. Data is the new oil; data intelligence is the new currency.

(credit Prof. Vermeulen)

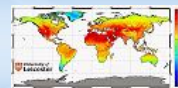
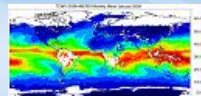
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(credit Prof. Vermeulen)



Exploitation  
Layer



Applications  
& Science

## Network of Resources

Platform  
Services  
Layer



Common Architecture/Open Interfaces

Resource  
Tier Layer  
Data/ICT



Data Generation  
Layer

Ground Segment  
Infra-structure



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# ESA objective is to assemble a leading European offering as the “place where to go” for EO Big Data Analytics

**Evolving Technical Capabilities** will be developed where gaps have been identified, e.g. Training Data Platform, Quality Assurance, AI extensions in preparation for DTE

Look Out  
for ITTs

**Common Architecture** of Platform Services will ensure that users can assemble different needed resources into their specific workflow

Use Cases  
wanted !!!

A federated “**Network of EO Resources**” will be built in a collaborative process assembling existing industrial, national, European investments sponsoring science use

Onboard your  
operational  
offering

## OGC Innovation Initiatives

- *OGC-17:*  
*Client API, Cloud data formats*
- *TBD Pilots*
- *TBD Sprints*

- I/F Standardisation
- API development
- Pilot demonstrations

Best Practise [TPZ-UK], C.Lopes

1 year, 100-200K per initiative

## Use Cases for OGC Testbeds

*Propose end-to-end use case using platform technology with existing infrastructure and platform offering*

- Innovation experimentation
- New Standard Prototyping
- “bring your contribution”

Via DCB Architecture WG, C.Lopes

1 year, 50-200K per use case



## Resource Tier Sponsoring

*Provide Cloud Services combining  
IaaS and DaaS  
for Block-4 EO Exploitation projects*

**USE IT!** <https://nor-discover.cloudeo.group>

- Operational Service Provision
- Technical I/F Standardisation
- T&C Standardisation

Project-driven selection, E.Doyle

Pre-qualified providers

## Platform Services Sponsoring

*Provide operational platform services  
boosting  
science and value adding activities  
to use the power of the Resource Tier*

- Operational Service Provision
- Technical I/F Standardisation
- T&C Standardisation

Best Practise [CloudEO], E.Doyle

Permanently Open, total 3000-5000K



## Regional Resource integration into Platform Services

*Host/integrate Regional Resources into  
existing platform offerings  
(e.g. data cube, TEPs)*

- Analytics capabilities
- Data
- Algorithms

Best Practise [CloudEO] Q4/20, E.Doyle

2-3 years, total 2000-3000K

## Special Call to integrate regional resources

- Analytics Capabilities
- Data
- Algorithms
- Small customisations for integration and operationalisation
- Market-oriented approach favoured (payable offerings)
- public free offerings will be supported for integration and maintenance

*no infrastructure sourcing  
(can be provided as free contribution)*



# Evolving Technical Capabilities (1/3)

## Quality Assurance Facility

*Quality Assurance and data  
Quality Certification Service  
based on AI technology*

- Process Definition
- Tool Development
- Service Provision

Open ITT Q2/21, O.Grabak

1 year, 500K

## NRT Platform Extension Missions & Capabilities

*Extend to new Missions  
(Pleiades, Iceye, Cosmo, ...)  
New capabilities  
Regional Use Cases*

- Integration with G/S
- Pre-processing dev.
- Service Provision

Open BP Q2/21, C.Lopes

1-2 years, 1000K



# Evolving Technical Capabilities (2/3)

## AI4Food “skin of the land”

*data fusion S1/S2  
time series modelling  
detection/predictions of  
change dynamics*

- Methodology Definition
- Experimental Development
- Machine Learning

Open ITT Q3/21, P.Griffiths

1 year, 600K

## AI Training Dataset Platform

*Hosting, sharing and  
curation of high quality  
training datasets*

- Process Definition
- Platform Development
- (Service Provision) *tbc*

Open ITT Q4/21, P.Griffiths

1-2 years, 500-1000K



# Evolving Technical Capabilities (3/3)

## Data Cube AI Extension for DTE

*Onboard a new partner to  
provide AI capabilities for  
the Euro Data Cube  
framework*

- Capability Evolution
- Integration into EDC
- Service Provision

Open BP Q3/21, P.Mougnaud

1 year, 500K

## TEP AI Extension for DTE

*Onboard new partners to  
provide AI capabilities for  
GEP, FS-TEP, U-TEP, P-TEP*

- Capability Evolution
- Integration into TEP
- Service Provision

Open BP Q4/21, various

1 year, 300-400K (x4)