

Workshop Report

Accessibility, data infrastructures & interoperability

Speakers:

William Ray (Sinergise/CDSE) and
Hannes I. Reuter (Eurostat E.4)

Facilitation: Sebastian Marcu (Design & Data)

Co-Facilitation: Ludvig Forslund (EEA)

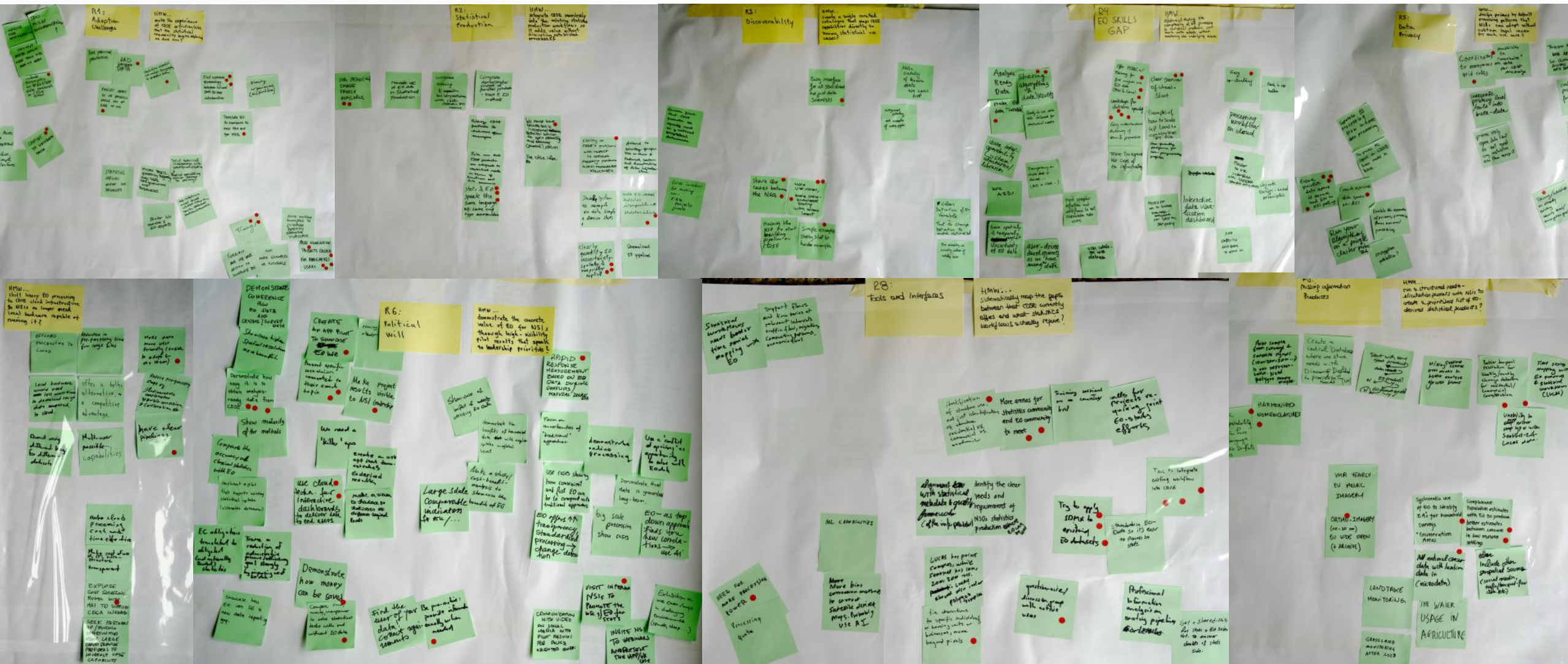
StatEO26, May 7

ESRIN, Frascati (RM)

Workshop · Impressions



Workshop Exercises · Board impressions



R1: Adaptive Challenges

- What are the challenges of adaptive challenges?
- How do we manage adaptive challenges?
- What are the challenges of adaptive challenges?

R2: Statistical Foundation

- What are the challenges of statistical foundation?
- How do we manage statistical foundation?
- What are the challenges of statistical foundation?

R3: Discoverability

- What are the challenges of discoverability?
- How do we manage discoverability?
- What are the challenges of discoverability?

R4: EO Skills GAP

- What are the challenges of EO Skills GAP?
- How do we manage EO Skills GAP?
- What are the challenges of EO Skills GAP?

R5: Data Privacy

- What are the challenges of data privacy?
- How do we manage data privacy?
- What are the challenges of data privacy?

R6: Political Will

- What are the challenges of political will?
- How do we manage political will?
- What are the challenges of political will?

R7: Tools and Interfaces

- What are the challenges of tools and interfaces?
- How do we manage tools and interfaces?
- What are the challenges of tools and interfaces?

R8: EO Skills GAP

- What are the challenges of EO Skills GAP?
- How do we manage EO Skills GAP?
- What are the challenges of EO Skills GAP?

R9: EO Skills GAP

- What are the challenges of EO Skills GAP?
- How do we manage EO Skills GAP?
- What are the challenges of EO Skills GAP?

R10: EO Skills GAP

- What are the challenges of EO Skills GAP?
- How do we manage EO Skills GAP?
- What are the challenges of EO Skills GAP?

Opening · the workshop's question

William Ray (Sinergise / CDSE) set the technical scope. The question on screen framed everything that followed.

Copernicus Data Space Ecosystem

Data Visualization

Copernicus Browser · WEKEO Data Viewer · downstream apps

Data Processing

Process · Statistical · openEO APIs · Jupyter Lab · IaaS · Kubernetes

Data Access

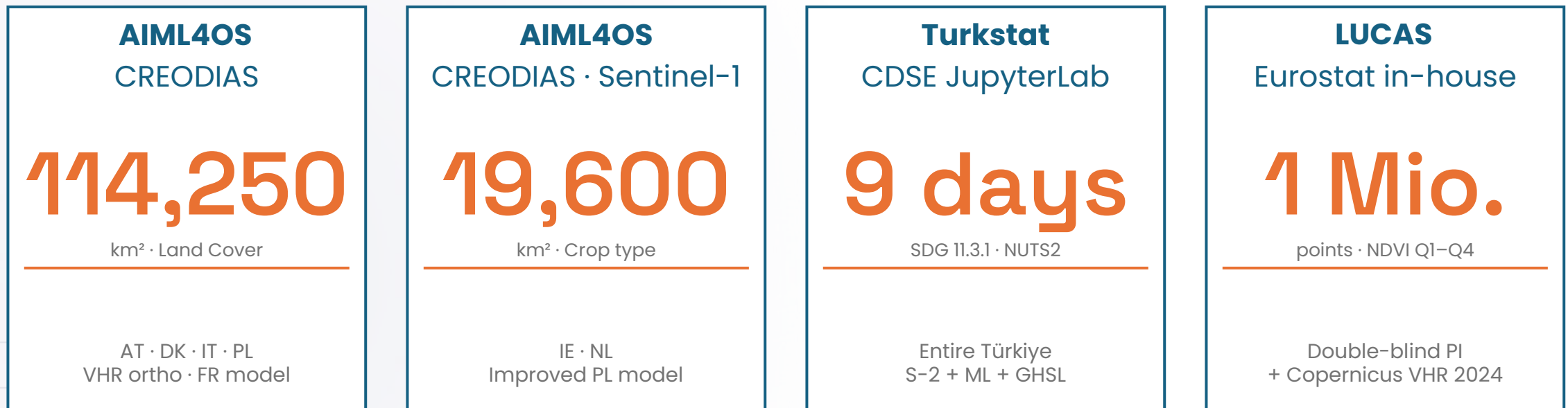
Sentinel archives · CLMS · Contributing Missions · Bring your own data (COG, ZARR)

How might we make EO data infrastructure more accessible and interoperable — so that statistical offices can adopt it as a routine part of their production?

Opening · the platform is already producing official statistics

Hannes I. Reuter (Eurostat E.4) presented three operational environments and four production deliverables. The workshop's HMWs are not about whether CDSE can do the work — they're about removing the remaining barriers for the next NSI to adopt it.

Already in production — three NSI/Eurostat environments, four deliverables



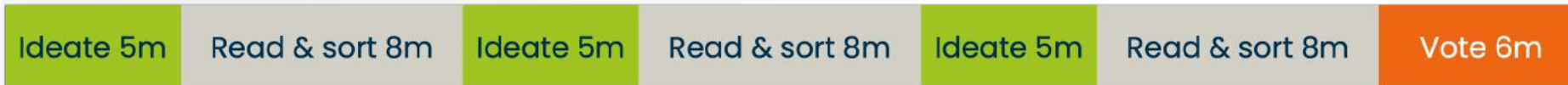
Heaviest CDSE usage from **January 2026** onward.

By **Summer 2026**, four production deliverables across **6 NSIs** and one in-house Eurostat project.

Workshop Exercises · Overview

Nine themed stations to ideate

- | | | |
|-------------------------------|----------------------------------|---------------------------------|
| R1 Adoption Challenges | R2 Statistical Production | R3 Discoverability |
| R4 EO Skills Gap | R5 Data Privacy | R6 Political Will |
| R7 IT Infrastructure | R8 Tools & Interfaces | R9 Missing Info Products |



Showing one participant's journey · 3 rounds of ideation at 3 stations · voting · 45 minutes

Workshop output in numbers

Participants

45

Items produced

188

Votes cast

108

Voted items

61

Top voted answers · R1 · Adoption Challenges

HMW... make the experience of CDSE so frictionless that the statistical community begins exploring on day one?

Make visualization products easier for non-expert users (5 votes)

Trainings (3 votes)

Find common terminology between EO and stats to ease collaboration (3 votes)

Chatbot to navigate data (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R2 · Statistical Production

HMW... integrate CDSE seamlessly into the existing statistical production workflows so it adds value without disrupting established processes?

Stats & EO speak the same language e.g. same crop type nomenclature (3 votes)

Clearly quantify EO uncertainty, spatially & temporally explicit (3 votes)

VHR ortho (<1m) images freely available (2 votes)

Make EO-derived indicators interoperable with statistics indicators (2 votes)

Items with ≥2 votes · full board in appendix

Top voted answers · R3 · Discoverability

HMW... create a single curated catalogue that maps CDSE capabilities directly to known statistical use cases?

More use-cases, more cross-knowledge sharing with lessons learnt (3 votes)

Share use cases between the NSOs (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R4 · EO Skills Gap

HMW... abstract away the complexity of EO processing so statistical producers can work with outputs without mastering the underlying science?

Workshops for statistics specialists (5 votes)

Sharing algorithms & datasets (2 votes)

Offer MOOCs / training for first insights into EO data (Pros & Cons) (2 votes)

Clear overview of where to start (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R5 · Data Privacy

HMW... design privacy by default processing patterns that NSIs can adopt without custom legal review for each use case?

Ensure private data space is secure and fits to NSI policy (4 votes)

Token based web apps so clients access ENV with security (2 votes)

Coordinates to anonymous grid cells (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R6 · Political Will

HMW... demonstrate the concrete value of EO for NSIs through high-visibility pilot results that speak to leadership priorities?

Demonstrate how easy it is to obtain analysis-ready data from CDSE (3 votes)

Use cloud techn. for interactive dashboards to deliver data to end users (2 votes)

Present specific case studies connected to their exact topic (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R7 · IT Infrastructure

HMW... shift heavy EO processing to CDSE cloud infrastructure so

NSIs no longer need local hardware capable of running it?

Guarantee long-term processing capabilities (not just a few years) (7 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R8 · Tools & Interfaces

HMW... systematically map the gaps between what CDSE currently offers and what statistics workflows actually require?

Try to apply SDMX to existing EO datasets (3 votes)

Tool to integrate existing workflows into CDSE (3 votes)

More arenas for statistics community and EO community to meet (2 votes)

Items with ≥ 2 votes · full board in appendix

Top voted answers · R9 · Missing Info Products

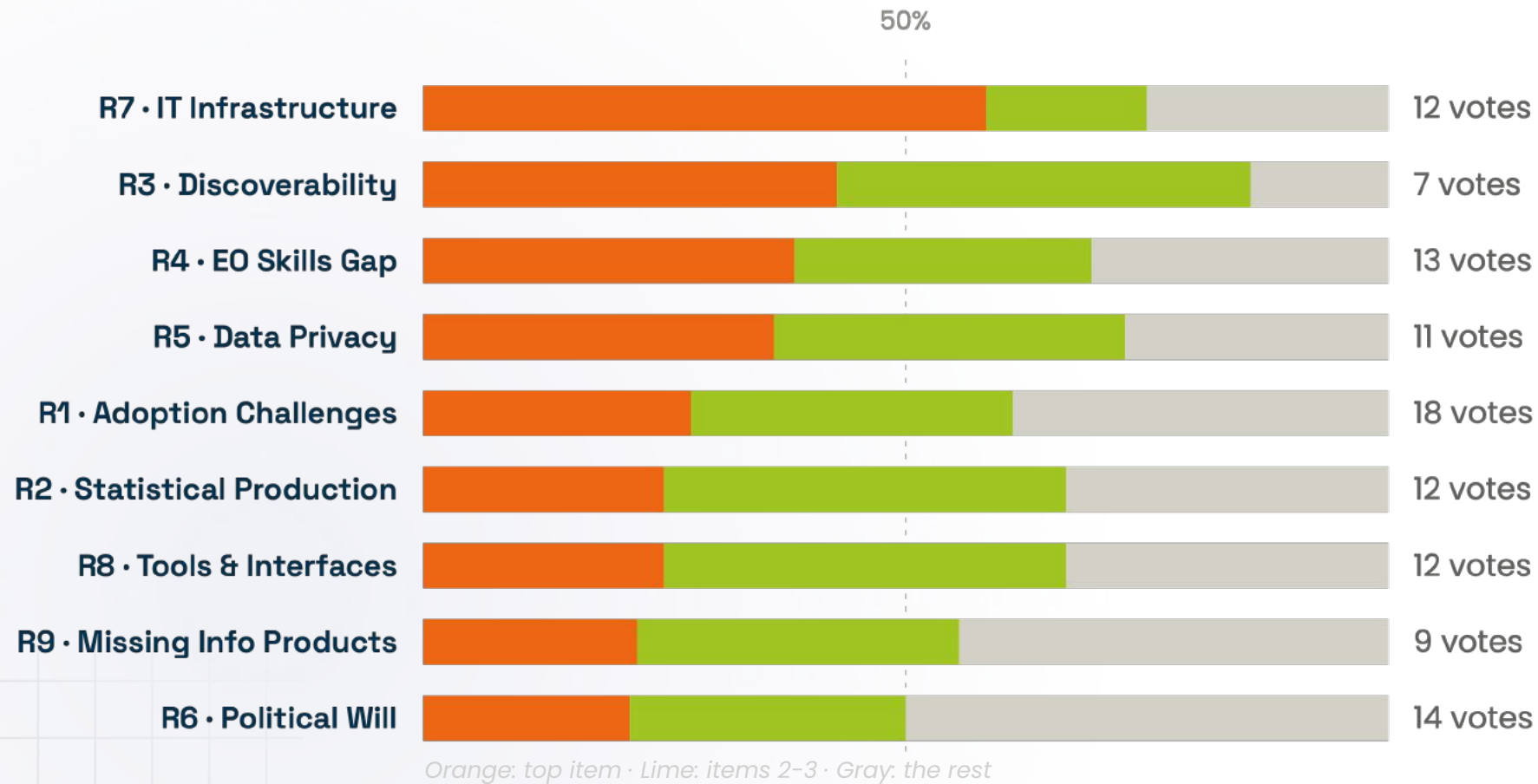
*HMW... run a structured needs-elicitation process with NSIs
to create a prioritised list of EO-derived statistical products?*

Complement population estimates with EO to produce better estimates between censuses in low resource settings (2 votes)

Better temporal resolution for weekly/monthly change detection for residential/commercial construction (2 votes)

Items with ≥ 2 votes · full board in appendix

Where the room concentrated



R7 is the only board where the top answer cleared half the votes (58%).

The next-highest concentration was **R3** at 43%.

Thesis · three imperatives

Durable.

Legible.

Teachable.

Durable · the sharpest signal



of 12 votes · 58%

**Guarantee long-term processing capabilities
(not just few years)**

R7 · IT Infrastructure

R7's 7-vote winner is the only answer in the workshop where one item collected a clear majority of its board's votes. Next-strongest: 5 votes, at 28–38% of board.

Legible · the language seam

R1	Find common terminology between EO and stats to ease collaboration	3 votes
R2	Stats & EO speak the same language e.g. same crop type nomenclature	3 votes
R8	More arenas for statistics community and EO community to meet	2 votes
R9	Semantic Interoperability so we can have same language to uptake different needs	1 vote
R9	Harmonized nomenclatures	1 vote
R4	<i>Easy understandable dictionary of terms & processes</i>	no votes

Six items across five boards push the same need — a shared vocabulary between EO and statistics. Ten votes on five of them; the R4 dictionary item surfaced unvoted.

Legible · show, don't explain

R1	Make visualization products easier for non-experts users	5 votes
R3	More use-cases, more cross-knowledge sharing with lessons learnt	3 votes
R6	Demonstrate how easy it is to obtain analysis-ready data from CDSE	3 votes
R3	Share use cases between the NSOs	2 votes
R6	Use cloud techn. for interactive dashboards to deliver data to end users	2 votes
R6	Present specific case studies connected to their exact topic	2 votes
R1	Include examples to translate GEE Javascript in CDSE Python	1 vote
R4	<i>Interactive data visualisation dashboard</i>	no votes

Eight items across four boards reach for the same lever — visualization, dashboards, case studies, demonstrations. When the room wants to convince, it shows; it doesn't explain.

Teachable · training as the answer

R4	Workshops for statistics specialists	5 votes
R1	Trainings	3 votes
R4	Offer MOOCs / training for first insights into EO data (Pros & Cons)	2 votes
R4	Clear overview of where to start	2 votes
R5	Training/Workshops on already existing security level/encryption possibilities	1 vote
R2	<i>Increased training & capacity building activities with CDSE-Statistics-EO nexus</i>	<i>no votes</i>
R8	<i>Training sessions on a country level</i>	<i>no votes</i>

Five boards reach for training when the room hits a skills-shaped problem — workshops, MOOCs, onboarding, country-level sessions. R4 carries the heaviest vote (13 total).

Note

Per-board top-voted answers (slides 8–16) are the workshop's direct output.

The thesis and its three supporting threads (slides 18, 20–22) are the analyst's post-hoc reading of patterns across boards — not themes the room itself surfaced or voted on.

Thank You for being part of this workshop!

Special thanks to **William Ray** and **Hannes I. Reuter** for the introduction and **Ludvig Forslund** for co-facilitating this workshop.



Got Questions / Feedback ?
Reach Out



Sebastian D. Marcu
s.marcu@designdata.de

Board R1

HMW... make the experience of CDSE so frictionless that the statistical community begins exploring on day one?

- 5v Make visualization products easier for non-experts users**
- 3v Find common terminology between EO and stats to ease collaboration**
- 3v Trainings**
- 2v Chatbot to navigate data**
- 1v Include examples to translate GEE Javascript in CDSE Python**
- 1v ARD gridded data**
- 1v Resolution mismatch and need for disaggregation of statistical data**
- 1v Preset ready to use statistics tools for an ease of use**
- 1v Translate EO to numbers to ease the use for NSOs**
- Improve CDSE documentation
- Too much documentation?
- Document better which CDSE tools fit best my needs
- Direct access to data (no registration)
- Clear, simple interface
- Post-processed production
- Statistics specific section for specialists
- More transparency regarding available configurations and resources.
- Solid technical integration with statistical pipeline -> Partial processing option (related to privacy)
- Broker b/w Statistical & EO experts
- Help statisticians accept derived indicators rather than specific statistical traditional measures
- Sharing experiences (difficulties)
- Tutorials and use cases section to illustrate task
- Add more examples or tutorials
- More worked examples to produce specific statistical indicators

Board R2

HMW... integrate CDSE seamlessly into the existing statistical production workflows so it adds value without disrupting established processes?

- 3v Stats & EO speak the same language e.g. same crop type nomenclature**
- 3v Clearly quantify EO uncertainty, spatially & temporally explicit**
- 2v VHR ortho (<1m) images freely available**
- 2v Make EO-derived indicators interoperable with statistics indicators**
- 1v We must have secure easily integrated technical solution to split processing and execute (partial) jobs on**
- 1v Clarity on CDSE's pros/cons with respect to national processing platforms -> less fragmented structures**
- Mandate use of EO data in statistical production
- Increased training & capacity building activities with CDSE-Statistics-EO nexus
- Complete demonstrator project of parallel production - trad & EO methods
- Publicize CDSE products to statistical offices managers
- Make sure that CDSE products are adequate to statistical needs in terms of timeliness and data frequency
- The CDSE infra.
- Attend to country specificities in terms of technical conditions and characteristics of data infrastructure
- Develop system to sample EO data simply & derive stats
- Streamlined EO pipelines

Board R3

HMW... create a single curated catalogue that maps CDSE capabilities directly to known statistical use cases?

3v More use-cases, more cross-knowledge sharing with lessons learnt

2v Share use cases between the NSOs

1v Easy interface for all statisticians not just data scientists

1v Simple examples step by step to harder examples

Ensure first that CDSE products are equally used as national geospatial datasources

Give incentives for making use – little projects grants

Make catalog of known stats use cases first

Categorised catalog and examples of existing pipeline

Training the NSO to start building pipeline on CDSE

Clear definition of EO variable – Tool to change definition to match National Def.

Give probability and uncertainty values of catalog data

Board R4

HMW... abstract away the complexity of EO processing so statistical producers can work with outputs without mastering the underlying science?

5v Workshops for statistics specialists

2v Sharing algorithms & datasets

2v Offer MOOCs / training for first insights into EO data (Pros & Cons)

2v Clear overview of where to start

1v Make EO data "invisible"

1v Easy up-scaling

Analysis Ready Data

Ready to use data sets tailored for statistical needs

Data interoperability -> share structures/libraries

Transparency on where data is stored... (AWS vs CDSE...)

More ARDs

Have spatially & temporally explicit uncertainty of EO data

User-driven developments as we have many EO data

Avoid complex definition and workflows to not overwhelm new users

STAT catalogue with datasets

Easy understandable dictionary of terms & processes

More transparent use cases of EO infrastructuring

Examples of how to scale up Local to country level IT wise

User-friendly platforms for non-programming profiles

MOOCs for non to limited knowledge background for step by step guiding

Jupyter notebooks

Interactive data visualisation dashboard

Ready to use toolbox

Processing workflow on cloud

Easier to use interfaces with invisible openEO entry points

Integrate design-based principles

ARD statistics dashboard to work on

Board R5

HMW... design privacy by default processing patterns that NSIs can adopt without custom legal review for each use case?

- 4v Ensure private data space is secure and fits to NSI policy**
- 2v Coordinates to anonymous grid cells**
- 2v Token based web apps so clients access ENV with security**
- 1v Create a private data space per NSI**
- 1v Define the adequate security conditions for the cloud**
- 1v Training/Workshops on already existing security level/encryption possibilities**
- Separate EO processing from in-house data processing
- Pre-process ML input on CDSE, train model in house
- Run your algorithms on a private & protected cluster
- Enable the separation of privacy processing from normal processing
- Encryption possibilities?
- Possibility to "anonymize" priv. data for CDSE processing
- Integrate privacy level/rule into meta-data
- Process only open data that do not need any restriction and then merge it
- Create some privacy standardization for cloud processing
- Gather specific needs/concerns from NSO's

Board R6

HMW... demonstrate the concrete value of EO for NSIs through high-visibility pilot results that speak to leadership priorities?

- 3v Demonstrate how easy it is to obtain analysis-ready data from CDSE.**
- 2v Present specific case studies connected to their exact topic**
- 2v Use cloud techn. for interactive dashboards to deliver data to end users**
- 1v Create an app pilot to showcase EO use**
- 1v Demonstrate how money can be saved**
- 1v Compare time, money, manpower to solve statistical tasks with and without EO data**
- 1v Make project results visible to NSI leadership**
- 1v Be pro-active: provide information exactly when needed**
- 1v Rapid response measurement based on EO data during conflicts / natural disasters**
- 1v Visit in person NSIs to promote the use of EO for stats**
- Demonstrate coherence b/w EO data and census/survey data
- Showcase higher spatial resolution as a benefit
- Show maturity of the methods
- Compare the accuracy of classical statistics with EO
- Implement a pilot that supports existing statistical uptake (alternative datasource)
- EC obligations translated to obligated (and nationally funded?) statistics
- Frame a reduction of administrative pressure / efficiency goal strongly by imposing use of EO data
- Showcase how EO can fill a new data reporting gap.
- We need a 'killer' app
- Create a web app that demonstrates EO derived results
- Make a viewer to showcase EO statistics at different regional levels
- Show-case of impact of utilizing EO Data
- Large scale comparable indicators for EU / ...
- Make a study / cost-benefit-analysis to showcase the benefits of EO
- Find the user of your data! Connect requirements

Board R6 continued

Demonstrate the benefits of harmonized data with regular uptake on a global level
Focus on uncertainties of "traditional" approaches.
Use cases showing how convenient and fast EO can be to compare with traditional approaches
EO offers ↑↑ transparency, standardized processing -> change detection
Demonstrate online processing
Use a 'conflict of opinions' as opportunity to solve with EO data
Demonstrate that data is guaranteed long-term.
Big scale processing show cases
EO - as top down approach finds you new correlations -> use AI
Communication with video on social media with pilot results for policy oriented audience
Invite NSI to webinars and present the app / UX case
Exhibition on use cases / maps in challenging environments (remote, steep...)

Board R7

HMW... shift heavy EO processing to CDSE cloud infrastructure so NSIs no longer need local hardware capable of running it?

7v Guarantee long-term processing capabilities (not just few years)

1v Create sensitive & client side federated temporary replica

1v Include all the satellite missions like Landsat, MODIS etc.

1v Make data more user friendly (easier to adopt & use)

1v Have clear pipelines

1v Explore cost sharing model with NSI to support CDSE infrast.

Create solutions for "security" issues NSIs might face when using cloud infrastructure

Platform needs to be long lasting and stable

Allow linking with external data sources (at high granularity)

Grant program to shift data-ecosystems from local to CDSE

Offload processing to cloud

Reduction in pre-processing times for large files

Local hardware would need less wait time to download large data compared to cloud

Offer a better alternative, or a competitive advantage

Avoid using different key for different datasets

Multi-user possible capabilities

Reduce pre-processing steps e.g., 1) Radiometric calibration 2) Orbit correction 3) Calibration etc.

Make cloud processing cost and time effective

Make cost of use of IT infrastructure transparent

Seek partnership / funding opportunities from large cloud service providers to increase CDSE capability

Board R8

HMW... systematically map the gaps between what CDSE currently offers and what statistics workflows actually require?

3v Try to apply SDMX to existing EO datasets

3v Tool to integrate existing workflows into CDSE

2v More arenas for statistics community and EO community to meet

1v Need for more processing power

1v Identification of structure use, not just identification of structure residential vs. commercial vs. academic

1v Tie observations to specific individual or housing units or businesses, move beyond pixels

1v Questionnaire / discussion group with active users

Statistical workflows need better time series mapping with EO

Support flows and time series at relevant intervals: traffic flow, migration, commuting patterns, economic flows

Processing quota

ML capabilities

More bias correction methods to correct satellite derived maps. Probably use AI

Training sessions on a country level

Calls for projects requiring joint EO-stats efforts

Alignment with statistical metadata & quality frameworks (of the info provided)

Identify the clear needs and requirement of NSOs statistics production where EO can be used

LUCAS has point samples, while Sentinel has 10m, 20m, 30m res. LUCAS should also include polygon samples

Standardise EO-Data so it's easier to process by stats.

Professional information analysis on existing pipeline

Get a shared-hub for stats + EO scientists to answer doubts of stats side.

Board R9

HMW... run a structured needs-elicitation process with NSIs to create a prioritised list of EO-derived statistical products?

2v Complement population estimates with EO to produce better estimates between censuses in low resource settings

2v Better temporal resolution for weekly/monthly change detection for residential/commercial construction

1v Semantic Interoperability so we can have same language to uptake different needs

1v Harmonized nomenclatures

1v Ortho-imagery (10-30 cm) EU wide open (+ archive)

1v Systematic use of EO to identify EA's for household surveys * Enumeration Areas

1v Add national census data with location data in (microdata)

Point samples from surveys & satellite signals (10m, 20m, 30m...) is not representative.

Need polygon samples maybe.

Create a central database where we store needs with Discovery Database to prioritize the needs (LH)

Start with end stat product -> data needs -> EO product? -> Y -> EO product exists? -> Y

Missing Sentinel scenes over arctic to better analyse glacier flows

Time series mapping with EO products & statistical workflows (LUCAS)

Inability to map minor crop types with Sentinel-2 & Lucas data.

VHR yearly EU mosaic imagery

Include other geospatial source (social media, traffic/transport-flow, etc. etc.)

Landtake monitoring

Grassland monitoring after 2023

The water usage in agriculture