



# DESIGNING ECOSYSTEMS TO ENABLE RECOGNITION AND ADOPTION OF OPEN SCIENCE MEASURES

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GenOA Week – Valutazione della ricerca

2022-11-07

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# Why measuring

Measurement or evaluation of research **emerged as a key policy-making tool** in late '60s to justify investments in scientific research across the world.

- For **Promotion** and Tenure
- Determine research **quality**
- Drive **allocation** of funding
- More and more kind of analysis...



-all the images in the document are sourced from Microsoft Stock Images-



# Measures based on bibliometrics

- Bibliometric indicators suppose that the **quality** of a particular article is **reflected by the frequency of its citations** in other articles
- Even if **citation-based** metrics are all recognized metrics, they give a **partial view** of the research activities
- Impact factor/Citescore, Field-Weighted measures, ... it all boils down to **citations**

Technologies were created in the last decades to support citational measures

# Criticisms to (bibliometric) indicators

- **Quantitative** evaluation should support **qualitative**, expert assessment: peer-review, not only data
- Variation in **fields** of research.
- Recognize the **systemic effects** of assessment and indicators.
- Actually, **similar criticisms** can be made to **any kind of indicators**, not only bibliometric indicators!

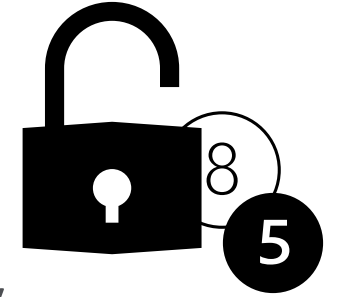


**Responsible indicators, transparent  
metrics and fair evaluation**

# Research assessment is changing

- National and international policies whose aim is a more **comprehensive research assessment**
- At many levels:
  - UNESCO Recommendation on Open Science RDA groups and initiatives
  - EU commission for Innovation, Research, Culture, Education and Youth,
  - Science Europe
  - European University Association
  - RDA groups and initiatives
  - COARA: Coalition for Advancing Research Assessment for research, researchers and research performing orgs.
  - ....
- Value **activities associated with openness**, among others

# Open Science indicators



- In the last years, there is a **growing interest** in Open Science in any community
- Open science has emerged as a **powerful trend** in research policies everywhere
- OS indicators **aim to provide data and insight needed to support the implementation** of these policies.
- Assess **the impact in OS in several ways** (FAIR data, reproducibility of experiments, sharing datasets, open access to publications, ...)

# New ecosystems

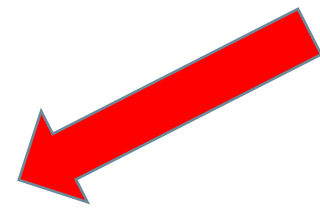
- Need of new ecosystems **comprehensive** of the many research aspects that should be part of an assessment
- Need of new ecosystems that are made of both:
  - **governing aspects & policies**
  - **enabling technologies and infrastructures**



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**AS HAPPENED FOR  
CITATIONAL INDICATORS!**





# New ecosystem: *"policies & guidelines"*

- **Policies and guidelines:** needed by both management and researchers to understand the importance of OS and data sharing
- Scientists and institutional management need to be **personally involved**
- OS is not a bureaucratic burden or **yet another metric:** benefits and implication of OS for research

Uptake of OS practices

# New ecosystem: "*enabling technologies*"


- OS measures means that **actual technologies and tools** to compute those measures are needed
- Understanding how OS data are collected and put together is key: which **metrics are relevant?**
- Designing a right ecosystem must consider which **metrics are computable** with the data, tools and systems at hand.
- Tools bring **benefits** also **beyond evaluation purposes**: scientists see and recognize the importance of OS

Recognition and monitoring of OS practices

# Synergy among existing systems

A new ecosystem must **leverage from existing systems**:

- **Augment** paper's metadata in bibliographic databases and other sources of information (e.g., Open Science, Altmetrics, ...)
- Metadata of any kind must be accessible **programmatically**
- Follow solid implementation processes and grant **sustainability of the ecosystem**
- Rely on the **specific** features and tools of a given institutional environment

 **...IIT "case study"**

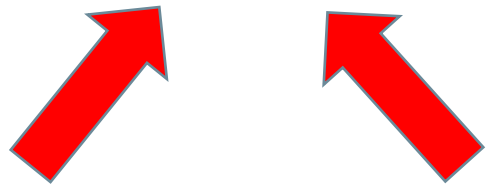
# Comprehensive approach in IIT

Recognition of many metrics: **not only** publications and bibliometrics! On our way to add OS metrics...

Peer review, panels of experts, defined procedures are **supported by several indicators**, including:

- Grants won and funding statistics
- Patents & Technology-transfer
- Industrial partnership and start-ups
- Awards, Editorship, Training course, ....
- Dissemination activities
- Open Science metrics

IIT



# IIT enabling technologies

- Collective effort to **make institutional systems interoperate** (HR, Technology Transfer, Projects and Grants Office, publications' metadata repository, ...)
- **Development of a platform** to collect and show all the research-related aspects, similar to a CRIS (Current Research Information System): **SCIENTILLA**
- Effective **data mining and data visualization** of data from heterogenous sources



# Our CRIS: SCIENTILLA

- **Scientilla** - open source : ) - Tool developed to be **useful** for our researchers **AND** for the management
- Place to **keep track of and manage** research output (publications, fund raising, tech transfer, awards, dissemination, ...) and edit their **profile information** (HR infos, cv-like entries, ...).
- **Overview** of activities at several **aggregation levels**: researchers, research groups, .... and centres.

The screenshot shows the SCIENTILLA user profile page for Ugo Moschini. The browser address bar indicates the URL is `scientilla.iit.it/#/profile`. The page header includes the SCIENTILLA logo, the user's name "Ugo Moschini", and a "Logout" button. The profile section features a circular profile picture, the name "Ugo Moschini", and his roles: "Research Administrative - Data Scientist | Data Manager" and "Data Analysis Office - Research Organization Directorate" with degrees "PHD, MSc".

On the left sidebar, there are sections for "Suggested", "Verified", "Drafts", and "External" items, followed by "Accomplishments" with an "Add" button, "Projects", "Patents", and "Training modules" with an "Add" button.

The main content area is divided into three columns:

- About:** A biographical section detailing his education (MSc in Computer Science from the University of Pisa in 2010), his work at the European Space Agency (ESA) from 2009-2011, and his PhD in Computer Science from the University of Groningen in 2016. It also mentions his current role at the Italian Institute of Technology (IIT) in the Data Analysis Office.
- Export:** A list of exportable data sets with checkboxes: Basic information \*, Socials, About me, Experiences, Education, Certificates, Skills, Documents, Accomplishments, and Invited talks. A note below states: "\* You can override the basic information with just text, therefore you have to go to 'Edit profile' via [edit icon] → 'My profile' → 'Export only'".

# SCIENTILLA's strengths

- It contains **reliable** and **trusted** data (**certified** by the researchers)
- It contains **accessible** and **exportable** data and metadata, fetched (also) automatically from internal and external systems.
- Scientilla **charts and indicators** allow researchers to get acquainted with bibliometric indicators enabling **transparency**.
- Integration with the public **IIT website** and **IIT People pages**.

**Next addition: keep track of OS aspects!**

# IIT enabling technologies for RDM

- A **Research Data Management** group was then created as a joint institutional effort (IT, Research Organization, Projects Office, Legal Office, ...)
- A **Dataverse** institutional repository was setup on IIT premises in 2021
- Interaction with Projects and Grants Office and scientists for **guided Data Management Plan** writing (possibly DMP software tools in the near future)
- **Active support** for researchers for sharing dataset properly - according to the **FAIR** principles



# IIT guidelines and supporting aspects for OS

- **Management** is aware of the **importance** of a reformed research assessment that would include OS aspects
- Extensive guidelines on the **IIT Intranet** for publishing OA papers and sharing datasets
- **Training and courses** given to researchers and PhD about Scientilla, RDM, data formats and data sharing, ...
- Involvement of researchers and clearly **defined** / **transparent** assessment procedures (qualitative and quantitative)
- **Peer review** by panels of expert must be used to evaluate OS practices as well, as done for the other indicators

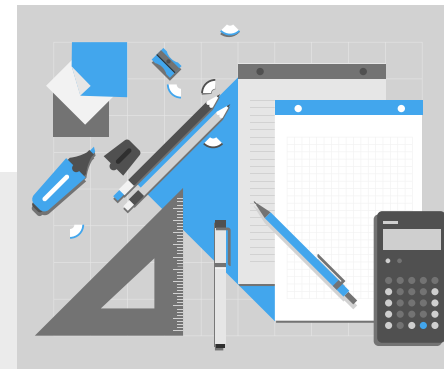
# Our ecosystem wants to help the scientist

- They can **keep track** of every groups' recent papers, citations, accomplishments, staff, grants, patents, all in one place
- Scientists **know** what the institute knows about them and can fix wrong information: **transparency**
- Thanks to RDM activities, the **scientist is not left alone** in dealing with OS and OA aspects
- **Scientist are involved** when evaluation activities takes place



# Adding OS and OS measures

- **Ongoing work** to add Open Science measures in the current ecosystem
- Design dashboard first and foremost with an **informative purpose** for both management and scientists: raise awareness
- Try to consider all the **multifaceted aspects of OS**. Ideas: open access publications breakdown, show open data, link open code, FAIR assessment, breakdown of repositories used, open educational resources, etc.
- Important to **link scholarly output to shared datasets**: it's all part of research activities, seeing them together helps!



# Integrating OA links




- Open Access versions of the [scientific papers are automatically fetched](#) using an integration with [OpenAIRE](#)
- Links to papers shown on [IIT public website](#).

Moschini U., Fenialdi E., Dan  
**A comparison of three  
their citing papers**  
Scientometrics, vol. 125, (n  
DOI 10.1007/s11192-020-03

Article

Journal



-  ZENODO
-  Crossref
-  UnpayWall



# Ideas for adding OS into our systems

- Researchers should be able to link the scientific production stored in Scientilla with information about the **research datasets (and other products) shared in each paper**
- Design dashboards **tailored on the exact activity** of the research group/researcher, first and foremost with an informative purpose
- All the **multifaceted** aspects of OS are considered: OA publishing, the kind of datasets, the licenses used to share a dataset, ...
- Study of and participation in ongoing work about the **development of OS measures, OS dashboards, and ways to improve the assessment**



**...next steps**

# On our way to boost the IIT ecosystem

- A **collaboration** will start in early 2023 between **IIT** and the **QUEST Center for Responsible Research** at the Berlin Institute of Health.

**QUEST** has experience in dashboard design, already available at <https://quest-dashboard.charite.de>:

- Responsible metrics
- FAIR dashboard

- **Skills4EOSC** - Horizon Europe - *Skills for the European Open Science Commons: Creating a Training Ecosystem for Open and FAIR Science:*

- although not directly related with assessment, it will **contribute to the uptake of FAIR and Open Data practices** providing support, professionalization, and resources to a variety of stakeholders.

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(now) 12:00-12:30

**Evgeny Bobrov**

*An institutional dashboard for monitoring responsible research practices in biomedicine (in English)*

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9 November 10:30-11:00

**Emma Lazzeri**

*Il progetto Skills4EOSC: una rete europea di centri di competenza per gli Open Science Commons*

# Conclusions

- We described our ideas and plans in setting up **new institutional ecosystems** for research assessment
- A reformed assessment that includes adoption and recognition of OS measures and practices is achieved through **governing & policies aspects** and new **enabling technologies**
- Evaluate the whole research "behaviour": analysis **driven but not determined by metrics**
- Invest on being **transparent** with the researchers and PIs: OS **awareness** more than **assessment**. Not yet another metric!
- **Reach out** and participate in initiatives (RDA WGs, IGs, ...), working groups, national and european projects, ...



Thank you for your attention!!



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