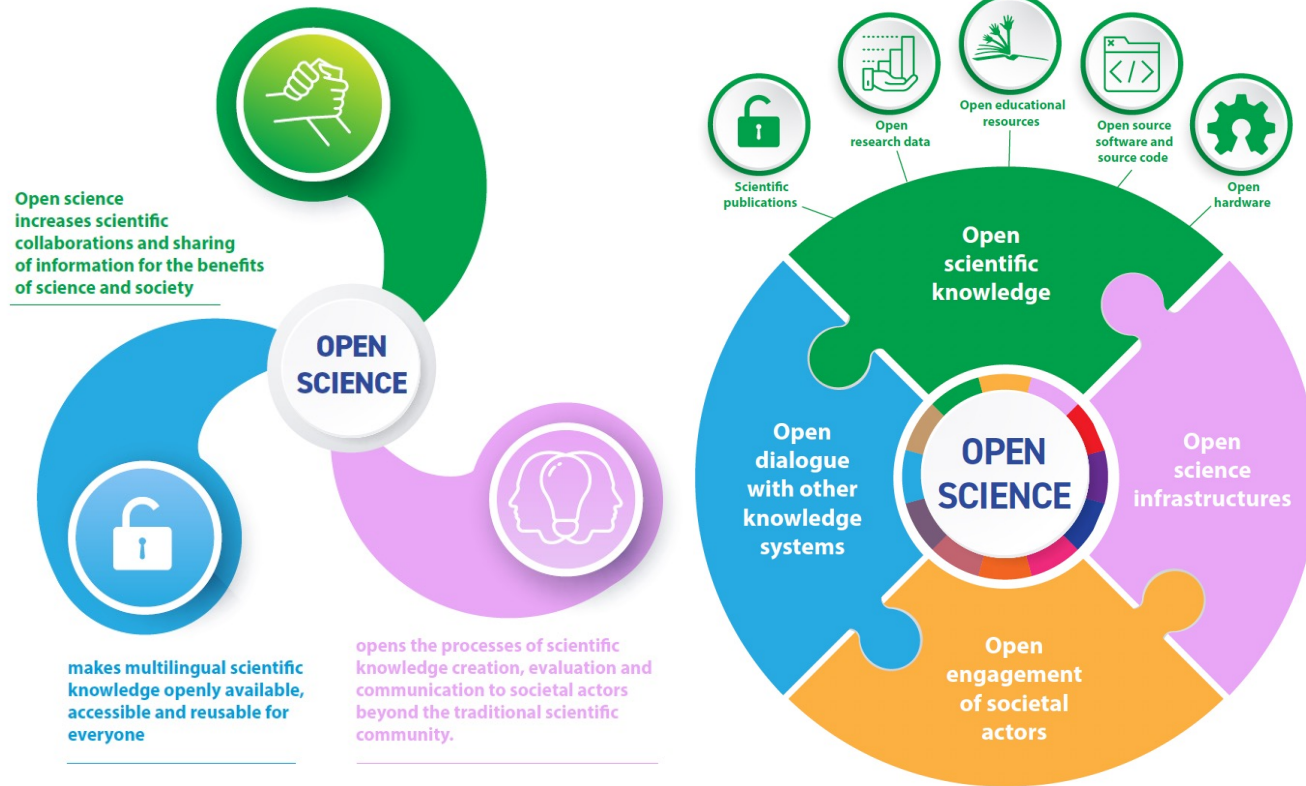# inseri.swiss
connecting data repositories, research methods, and researchers

Andrei Plamada

EnhanceR Symposium 2023
18 October 2023

Open Science

United Nations Educational, Scientific and Cultural Organization (UNESCO) Recommendation on Open Science (2021) CC BY-SA 3.0 IGO
DOI: 10.54677/MNMH8546

Open Science: Science Communication

Open science increases scientific collaborations and sharing of information for the benefits of science and society

OPEN SCIENCE

makes multilingual scientific knowledge openly available, accessible and reusable for everyone

opens the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.

Scientific publications

Open research data

Open educational resources

Open source software and source code

Open hardware

Open scientific knowledge

Open dialogue with other knowledge systems

OPEN SCIENCE

Open science infrastructures

Open engagement of societal actors

16.f. page 21
*"Enhancing open **science communication** to support the dissemination of scientific knowledge to scholars in other research fields, decision makers and the public at large."*

3

Science Communication: Publications format

Web sites – Digital items, each consisting of multiple pages produced by someone with **technical skills** or the ability to pay someone with **technical skills**.

Blogs – Frequently updated **websites** that **do not necessarily require extensive technical skills** and can be published by virtually anyone for no cost to themselves other than the time they devote to content creation.

Publications format: Jupyter Notebooks for reproducible computational workflows

Jupyter Notebooks—a publishing format for reproducible computational workflows

Thomas KLUYVER[a,1], Benjamin RAGAN-KELLEY[b,1], Fernando PÉREZ[c], Brian
GRANGER[d], Matthias BUSSONNIER[c], Jonathan FREDERIC[d], Kyle KELLEY[e],
Jessica HAMRICK[c], Jason GROUT[f], Sylvain CORLAY[f], Paul IVANOV[g], Damián
AVILA[h], Safia ABDALLA[i], Carol WILLING[d] and Jupyter Development Team[j]

[a] University of Southampton, UK
[b] Simula Research Lab, Norway
[c] University of California, Berkeley, USA
[d] California Polytechnic State University, San Luis Obispo, USA
[e] Rackspace
[f] Bloomberg LP
[g] Disqus
[h] Continuum Analytics
[i] Project Jupyter
[j] Worldwide

Abstract. It is increasingly necessary for researchers in all fields to write computer code, and in order to reproduce research results, it is important that this code is published. We present Jupyter notebooks, a document format for publishing code, results and explanations in a form that is both readable and executable. We discuss various tools and use cases for notebook documents.

Keywords. Notebook, reproducibility, research code

1. Introduction

Researchers today across all academic disciplines often need to write computer code in order to collect and process data, carry out statistical tests, run simulations or draw figures. The widely applicable libraries and tools for this are often developed as open source projects (such as NumPy, Julia, or FEniCS), but the specific code researchers write for a particular piece of work is often left unpublished, hindering reproducibility. Some authors may describe computational methods in prose, as part of a general description of research methods. But human language lacks the precision of code, and reproducing such methods is not as quick or as reliable as it should be. Others provide code separately as supplementary material, but it may be difficult for readers to cross reference between code and prose, and there is a risk that the two become inconsistent as the author works on them.

Notebooks—documents integrating prose, code and results—offer a way to publish a computational method which can be readily read and replicated.

[1] Corresponding Author.

https://jupyter.org/
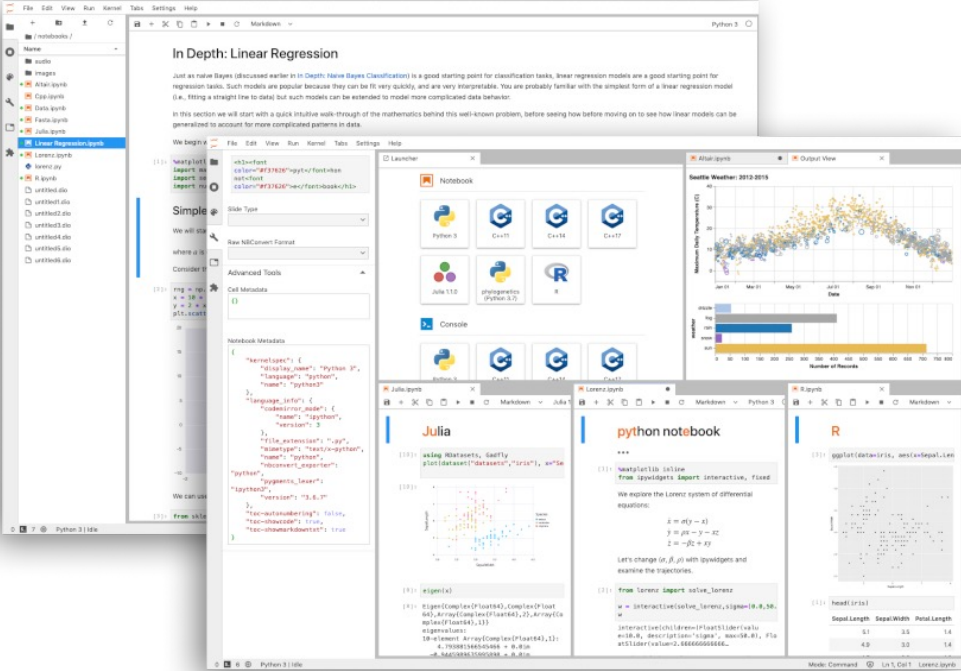
DOI: 10.3233/978-1-61499-649-1-87

Why inseri.swiss?

Modern and interactive online **publication format** to facilitate **open science**

1. **Easy-to-use** (low-code/no-code)

2. **transdisciplinary**

3. **Open, FAIR, citable**

4. **Interactive** and **executable** modern **web content**

5. **Reuse and re-mixing** of publicly funded research outputs (open access)

6. **Easy to operate** and **sustainable** (potentially part of the services provided by the central IT)

"WordPress is web publishing software you can use to create a **beautiful website or blog**. We like to say that WordPress is both free and priceless at the same time."
"WordPress is more than a **publishing platform**. …"

- WordPress Is, by Far, the Most Used CMS (61.8% market share)

- 35% of the Web uses WordPress

Source: The Best Web Hosting of 2022 https://digital.com/best-web-hosting/wordpress/statistics/

6

inseri.swiss Project

inseri.swiss

- swissuniversities project (2021– 2024) *Programme Open Science – Setting up of shared services & e-infrastructures*
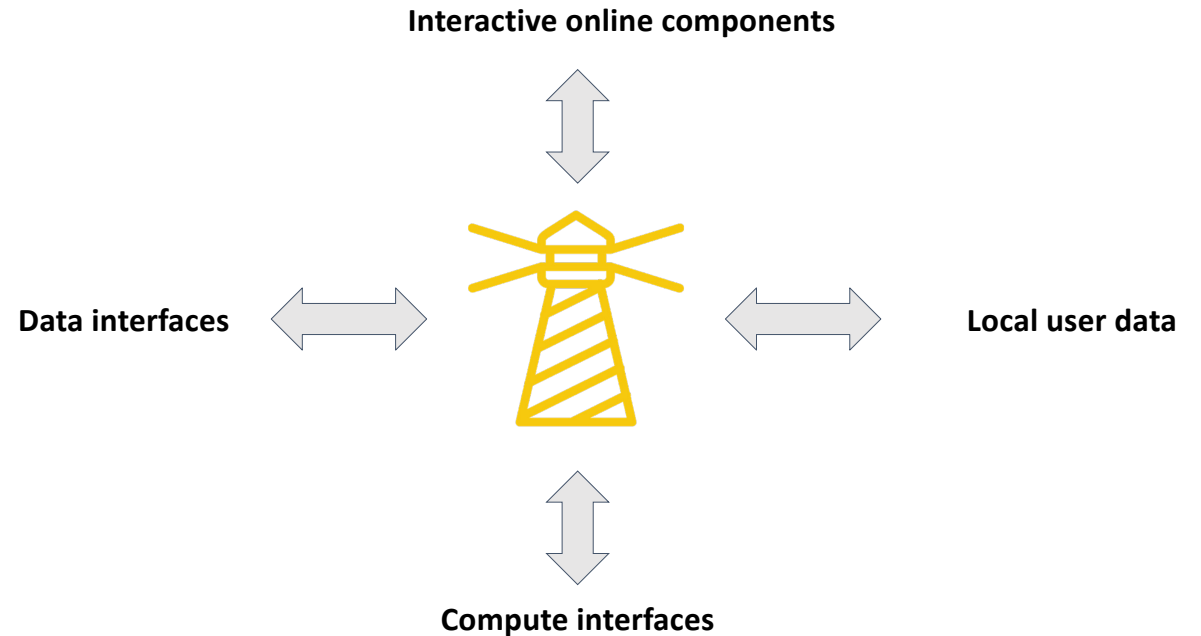
Main Goal

- **business plan** for a sustainable service

- required software extensions based on use cases

Partners:

- Universität Zürich: Science IT (leading house)

- Universität Bern: Digital Humanities Dep. + Science IT Support (ScITS)

- Universität Basel: DHLab

- Central Library Zürich: ZH-Lab

- Foundation Archives Jean Piaget

- EnhanceR

Use Cases

– **Creation of own website for research output**

  – Complement traditional research output (PDF publication) with a Web format

– **Interactive online tool**

  – Visualisation components

  – Ease to reuse (also with own data)

– **Data reuse and integration with data sources**

  – Reuse open published data with previously published online tools

– **Data analysis / simulation**

  – No need to set up the computational environment

  – Runnable and Reusable without going into the details of the programming language used for the analysis
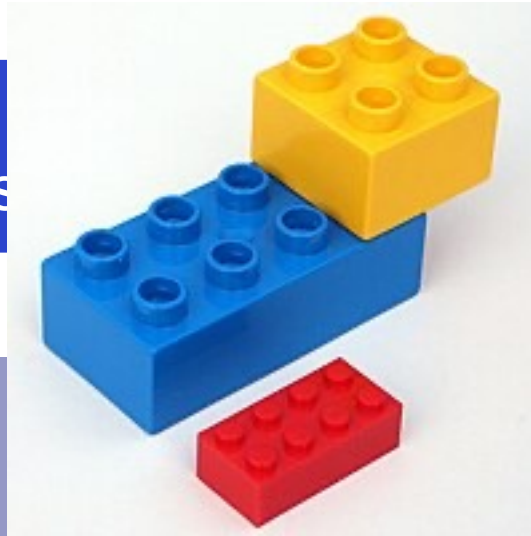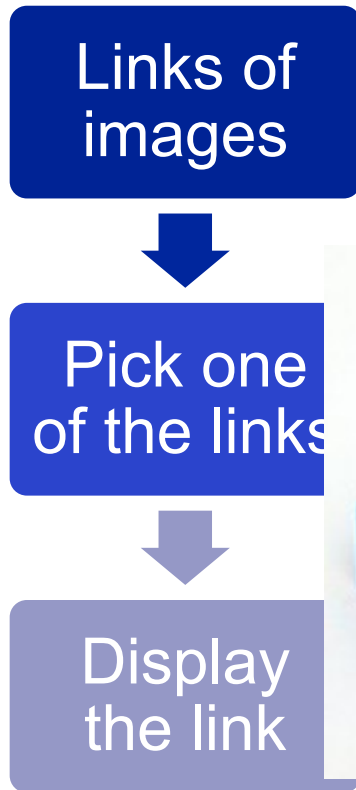
Interactive online components

Data interfaces

Local user data

Compute interfaces

WordPress
Gutenberg Editor – Building with Blocks

WordPress Gutenberg – Building with Blocks
inseri – Building with Blocks that enable the Interactivity

Links of images

Pick one of the links

Display the link

```
1  [
2    {"label": "UZH Acronym","value":"https://www.cd.uzh.ch/cd/dam/jcr:31f38b33-
     1619-4ba1-a21c-4dae47e9d0e5/UZH-Logo-Akronym.2020-01-15-11-51-14.gif"},
3    {"label": "UZH Logos", "value":"https://www.cd.uzh.ch/dam/jcr:79ffe4ce-
     bbe9-498e-94a8-d7d5b66400b2/UZH_logo_pos_d_e.gif"}
4  ]
```

Choose an item

UZH Acronym ×

UZH Acronym

UZH Logos

UZH

Live example

Roadmap

Now v0.3.1

Minimum Viable Product (MVP)
- v0.1.0

inseri blocks
- IIIF Viewer

inseri blocks
- JSON transformation
- display tables
- R block (if feasible)
- Driven by use cases

Versioning
- WP revisions
- Pages and Posts

Zenodo Integration
- Integration of PID
- PID and Longevity

As an Official WordPress plugin
- v0.2.1

Data Flow
- inseri blocks

Restore State
- encoded query param
- Pages and Posts

Convert to Static Assets & Export and Import
- Pages and Posts

Business Plan and Use Cases

- Business Model
- Collect Use Cases
- Marketing – Present inseri.swiss to/during
  - Science IT Units from other universities
  - UZH Units
  - Open Science events
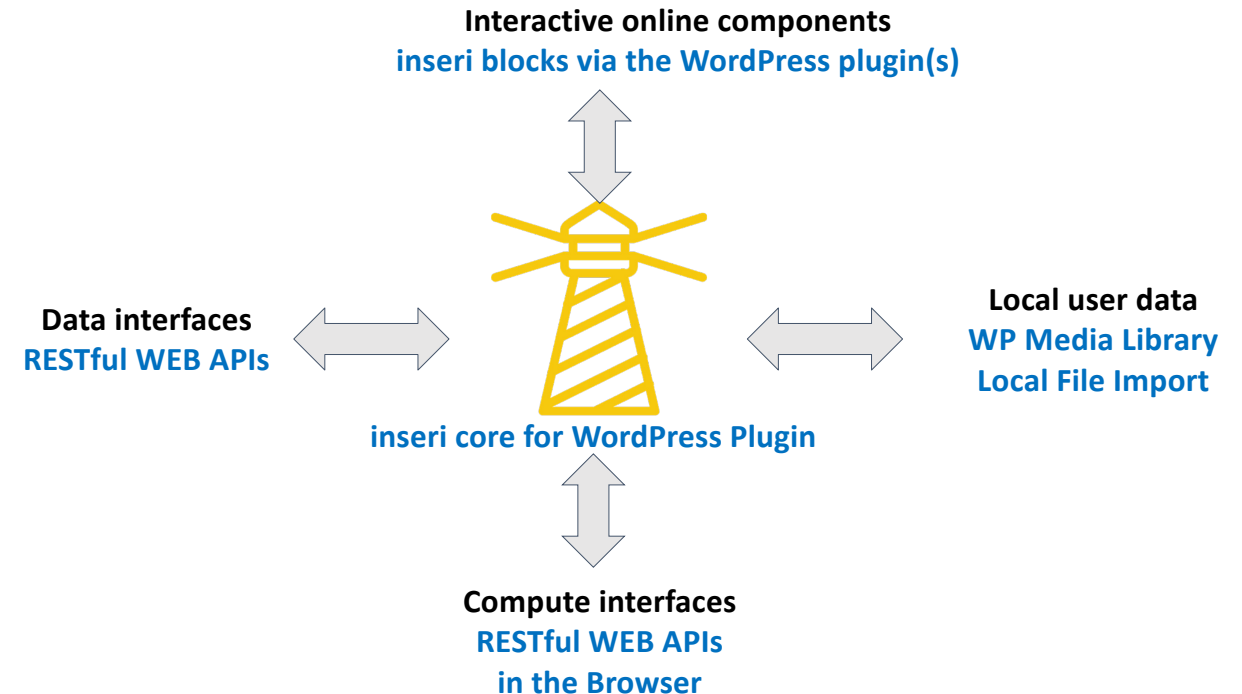 - …

11

Status

inseri core Blocks:

- **Text Editor:** Write JSON, XML, HTML, ...

- **Text Viewer:** View JSON, XML, HTML, ...

- **Local File Import:** Let visitor import local data

- **Download:** Let visitor download block data

- **Dropdown:** Provide options to choose from

- **HTML Code:** Render HTML code

- **Image Box:** Display image

- **Media Collection:** Load file from media library

- **Plotly Chart:** Create interactive charts with plotly.js

- **Python Code:** Run Python code (via Pyodide)

- **Web API:** Load data from a Web API

- **Zenodo Repository:** Load data from Zenodo.org

- **IIIF Viewer:** View content based on IIIF manifest

Public Presence:

- WordPress instance – inseri.swiss

- documentation – docs.inseri.swiss

- inseri playground – inseri.swiss/playground

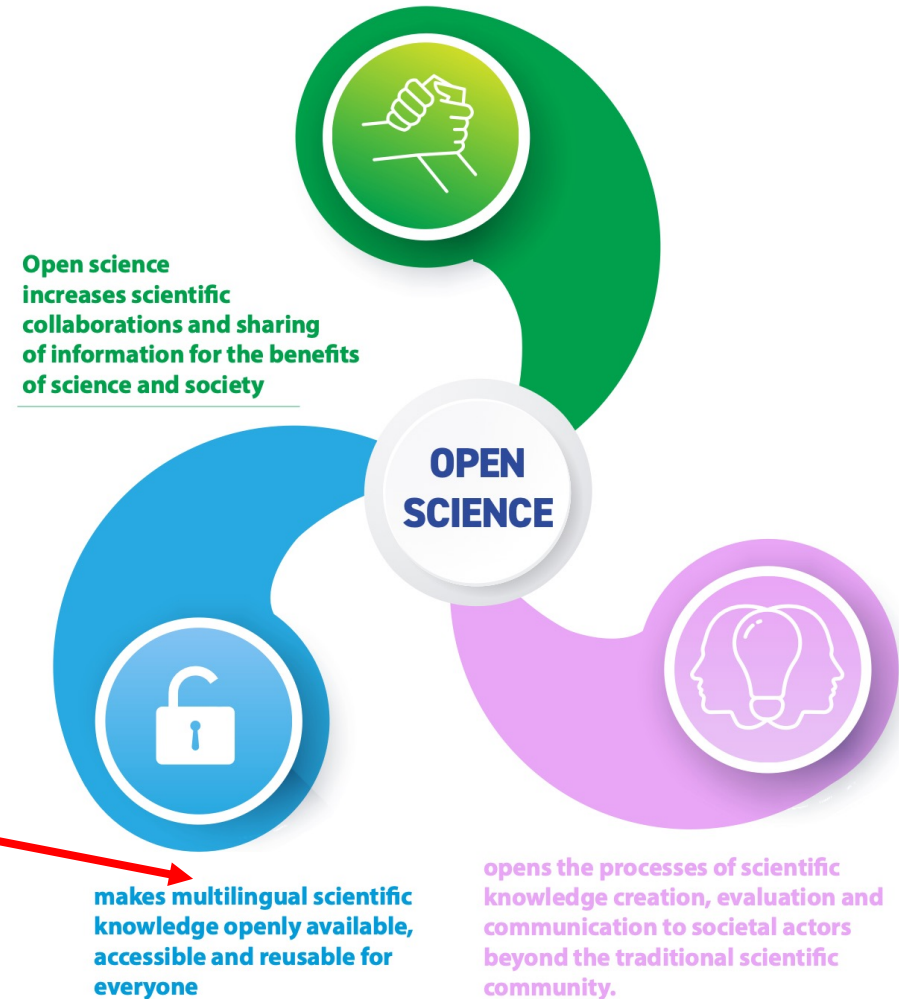- inseri core is an official WordPress plugin – wordpress.org/plugins/inseri-core/

Use Cases

– **Creation of own website for research output**

  – Complement traditional research output (PDF publication) with a Web format

– **Interactive online tool**

  – Visualisation components

  – Ease to reuse (also with own data)

– **Data reuse and integration with data sources**

  – Reuse open published data with previously published online tools

– **Data analysis / simulation**

  – No need to set up the computational environment

  – Runnable and Reusable without going into the details of the programming language used for the analysis

Interactive online components
inseri blocks via the WordPress plugin(s)

Data interfaces
RESTful WEB APIs

Local user data
WP Media Library
Local File Import

inseri core for WordPress Plugin

Compute interfaces
RESTful WEB APIs
in the Browser

WordPress Long Term Roadmap - here

The Four Phases of Gutenberg

1. **Easier Editing** — Already available in WordPress, with ongoing improvements (**2018 – WordPress 5.0**)

2. **Customization** — Full site editing, block patterns, block directory, block themes (**2019-2023**)

3. **Collaboration** — A more intuitive way to co-author content (**starting in 2023**)

4. **Multi-lingual** — Core implementation for Multi-lingual sites (**tbd**)

Open science increases scientific collaborations and sharing of information for the benefits of science and society

OPEN SCIENCE

makes multilingual scientific knowledge openly available, accessible and reusable for everyone

opens the processes of scientific knowledge creation, evaluation and communication to societal actors beyond the traditional scientific community.

Thanks and Questions

- Do you want to be an **early adopter**?

- Do you plan to use inseri for your **research project**?

- Are you interested in a future **collaboration** in the context of **open science**?

Contact us at inseri-contact@s3it.lists.uzh.ch

Source: https://www.lego.com/de-ch/service/buildinginstructions/45028