BioData.pt

Socio-economic impact of research activities

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Main trends and players in assessing impact of research

- ESFRI
- OECD
- RI-PATHS

Performance

Scientific, social and economic

Impact

Social and economic

Impact

Who cares about performance and impact of research?

National authorities	Justify investment; demonstrate scientific and economic returns on public investment.
Regional/local authorities	Justify investment; increased attractiveness of the area (incl. attractiveness and quality of local higher education institutions); benefits to local businesses and the development of local/regional innovation ecosystems
Research funders	Maximise return on investment and show benefits for public good
Research professionals	*Ex ante* assessment to demonstrate potential impact for funders Monitor impact on a regular basis to improve performance, and gather information to make the case to funders for sustainability including upgrades
Research hosts	Demonstrate the value of the research in terms of scientific attractiveness and skills
Civil society/general public	Value for money, new scientific knowledge, general benefit to society (e.g. health, energy, food security).

Adapted from Reference framework for assessing the scientific and socio-economic impact of research infrastructures, OECD 2019

Useful distinctions

- Scientific impact

- Social and economic impact

Discussion!

Go to **menti.com** and type **4122113**

Useful distinctions

- Scientific impact = Counting of citations.

  "...the impact that scientific research has within the academic sphere."[1]
- Social and economic impact

  "... advantages and disadvantages for society as a whole and for various parties."[2]

1. Ravenscroft J, Liakata M, Clare A, Duma D (2017) Measuring scientific impact beyond academia: An assessment of existing impact metrics and proposed improvements. PLoS ONE 12(3): e0173152. doi:10.1371/journal.pone.0173152.

2. Swedish Environmental Protection Agency.

Useful distinctions

- Performance

  “how well a person, machine, etc. does a piece of work or an activity.”[3]

- Impact

Quiz

Go to **menti.com** and type **4034256**

3. Cambridge Dictionary

4. Introduction to socio-economic impact assessment

Useful distinctions

- Performance

  “how well a person, machine, etc. does a piece of work or an activity.”[3]

- Impact

  “potential changes caused – directly or indirectly, in whole or in part, for better or for worse – by industrial **(research)** development activities.”[4]

3. Cambridge Dictionary

4. Introduction to socio-economic impact assessment

Useful distinctions

- Performance Indicators - KPI are types of performance measurements that evaluate the success of an organization or particular activity.[5]

- Impact Indicators - Transformative manifest effects of an organization/project/activity (short, mid and long term) on the economy and the society.[6]

5. Wikipedia
6. RI-PATHS

Assessing impact of RIs

The landscape of performance and impact assessment in RIs:

- How are ESFRI distributed landmarks demonstrating their performance & impact?
- What indicators are they using?
- Similarities?
- Differences?

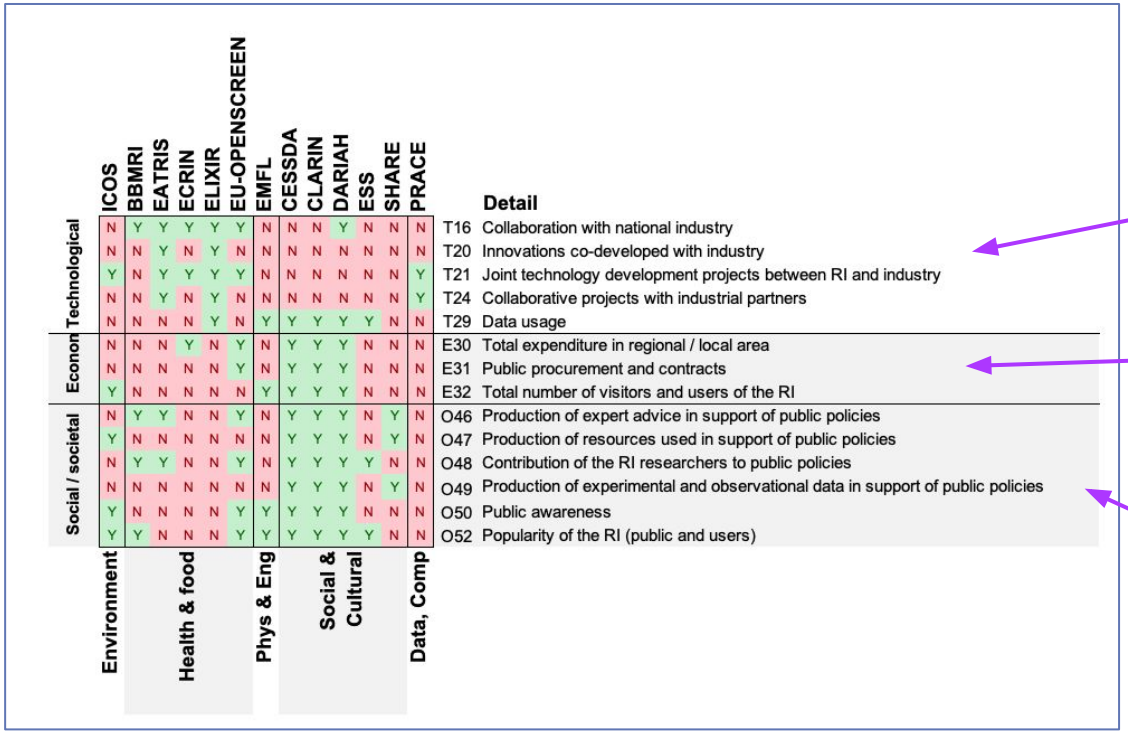
Sources: 2018 annual reports

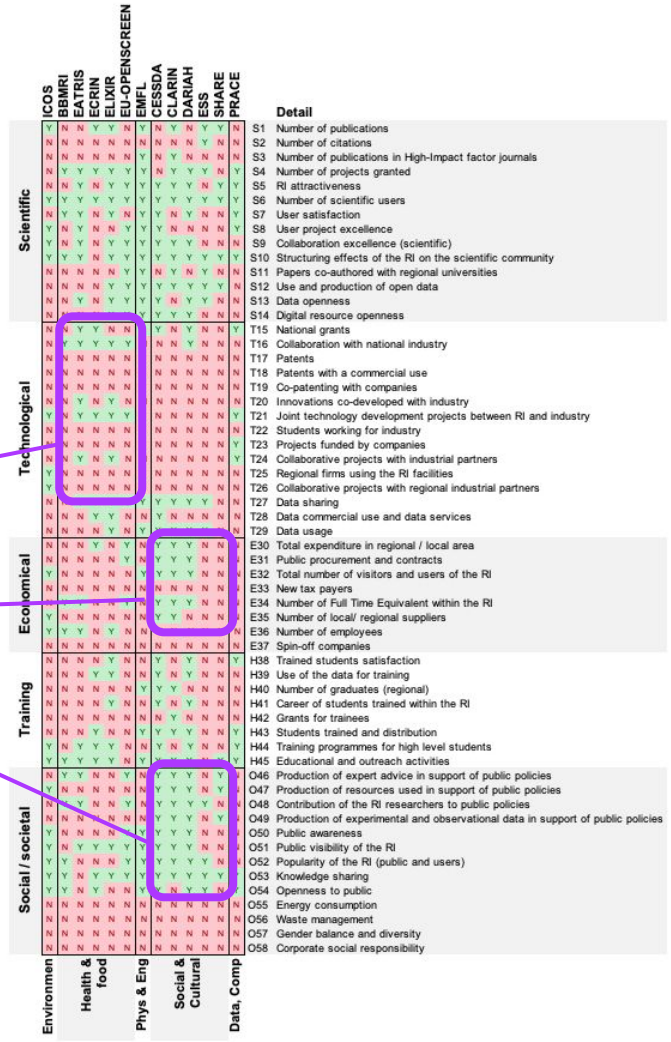
ESFRI domain	RI name	Full name	Comments
Environment	ICOS	Integrated Carbon Observation System	Impact assessment report available
Health & Food	BBMRI	Biobanking and BioMolecular Resources Research Infrastructure	Comprehensive KPI analysis available
	EATRIS	European Advanced Translational Research Infrastructure in Medicine	
	ECRIN	European Clinical Research Infrastructure Network	
	ELIXIR	A distributed infrastructure for life-science information	
	EU-OPENSCREEN	European Infrastructure of Open Screening Platforms for Chemical Biology	Activity and Financial Report 2018, mainly concerning scientific impact
Physical Sciences & Engineering	EMFL	European Magnetic Field Laboratory	Mainly scientific AR with highlights and development, list of publications.
Social & Cultural Innovation	CESSDA ERIC	Consortium of European Social Science Data Archives	Impact assessment available
	CLARIN ERIC	Common Language Resources and Technology Infrastructure	
	DARIAH ERIC	Digital Research Infrastructure for the Arts and Humanities	
	ESS ERIC	European Social Survey distributed	Comparative impact study of the European Social Survey (ESS) available
	SHARE ERIC	Survey of Health, Ageing and Retirement in Europe distributed	
Data, Computing and Digital RIs	PRACE	Partnership for Advanced Computing in Europe	

From Melo, AMP; Stansberg, C; Strachatova, A; Alloza, E; and De Leo, F (2020) ELIXIR All Hands "Empowering ELIXIR Nodes to measure and communicate their performance and impact"

OECD impact indicator mapping across RI reports

RIs tend to use domain related indicators





From Melo, AMP; Stansberg, C; Strachatova, A; Alloza, E; and De Leo, F (2020) ELIXIR All Hands "Empowering ELIXIR Nodes to measure and communicate their performance and impact"

The RI PATHS framework

Aimed to give policy makers, funders and RI managers the **tools to assess RI impact** on the economy and society to improve the understanding of long-term **impact pathways** of various types of RIs.

The framework provides guidance to select adequate impact pathways and indicators.

Adapted from Rami, MB (2020) ELIXIR workshop: Impact Assessment at the National Node Level, "RI-PATHS Impact assessment framework"

The RI PATHS framework

Impact Pathway:

the process from inputs, activities, outputs, outcomes to impact.

Quiz

Go to **menti.com** and type **2721253**

The RI PATHS framework

Impact Pathway:

the process from inputs, activities, outputs, outcomes to impact.

RI-PATHS established a list of pathways to assess impact of RIs.

P1 - Publication-citation-recognition

P2 - Technology transfer & licensing

P3 - Employment, operations and standardised procurement

P4 - Learning and training through joint development of instruments and tools

P5 - Learning and training by using RI's facilities and services

P6 - Training and higher education cooperation

P7 - Interactive problem solution for the private sector (industry)

P8 - Addressing societal and public sector challenges

P9 - Provision of specifically curated/edited data

P10 - Changing fundamentals of research practice

P11 - Creating and shaping scientific networks and communities

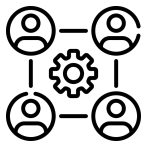
P12 - Promoting dialogue between science, society and policy

P13 - Communication, outreach and engagement

The RI-PATHS framework

Impact Areas: socio-economic areas where the activities of RIs raise impact.

The RI-PATHS project defined:



Human Resources

Social/Societal

Economic and Innovation

Policy

Icons made by Freepik, geotatah, pongsakornRed and Kiranshastry from www.flaticon.com

The RI PATHS framework

Indicators (Concrete quantitative or qualitative description of activities, outcomes, impact; organized by areas of impact)

- **Activity indicator**

  What the RI does and has some managerial control

- **Outcome indicator**

  Short-term effects of RI's activities, where it has no control

- **Impact indicator**

  Transformative effects of an RI (short, mid and long term) on the economy and the society

Adapted from Rami, MB (2020) ELIXIR workshop: Impact Assessment at the National Node Level, "RI-PATHS Impact assessment framework"

The RI PATHS framework

More about Indicators

Interaction

Examples:

- "Number of courses delivered" is a reasonable indicator for the activity "Data management course";
- "Number of people trained" is a reasonable indicator for the outcome "Course attendance";
- "Number of Portuguese datasets published" is a reasonable indicator for the impact "More Portuguese datasets published".

The RI PATHS framework

Example - indicators

PATHWAY: LEARNING AND TRAINING BY USING RI's FACILITIES

- *Number and duration of stays of Post-Docs/Professors*
- *Number and duration of stays of M.Sc./Ph.D. students*
- *Number and duration of (non-scientific) internships*
- *Number of (non-scientific) trainees*
- *Grants for trainees: Grants for trainees to follow RI trainings*
- *Number of technical staff*
- *Number of administrative/ research management staff*
- *Number of training measures for external users*
- *Number of higher education students trained within RI*
- *Number of long-term higher education training programmes*
- *Number of conferences/seminars hosted/organised by RI*
- *Number of students from local universities using the RI*
- **Satisfaction of people trained**
- **Academic career advances after leave (promotion, ...)**
- **Salary increase of researchers after leaving**
- **Career advances through technical/ administrative qualification**
- **Improvement on HR Science and Technology in the Region**

IMPACTS ON HUMAN RESOURCES

From Rami, MB (2020) ELIXIR workshop: Impact Assessment at the National Node Level, "RI-PATHS Impact assessment framework"

The RI PATHS framework

Example - indicators

PATHWAY: LEARNING AND TRAINING BY USING RI's FACILITIES

- *Number of scientific users*
- *Hosting of (high-level) scientific events (eg conferences)*
- *Visits to (high-level) scientific events (eg conferences)*
- *School classes and or university courses visiting*
- **Use of open data (access and download)**
- **Satisfaction of scientific users**
- **Public awareness: Visitors on RI website**
- **Solution of societal challenges: Health, Ageing etc.**
- **Solution of public sector challenges: Culture, Admin,...**
- **Contribution to environmental sustainability: Energy issues**
- **Contribution to environmental sustainability: Waste issues**
- **Contribution to social sustainability: CSR**
- **Contribution to social sustainability: Social inclusion goals**
- **Contribution to Gender balance (employees, users)**
- **Increased trust in science**

IMPACTS ON SOCIETY

From Rami, MB (2020) ELIXIR workshop: Impact Assessment at the National Node Level, "RI-PATHS Impact assessment framework"

Other concepts and definitions

Project/activity: the project or activity that is going to be assessed (e.g.CorkOak DB, Ready for BioData Management, GTPB, BioData.pt project...).

Objectives/Mission: Strategic objectives of the organization that will progress with this pathway (e.g. Become the reference long-term research infrastructure (RI) for bioinformatics and data management support for the academic system and the industrial sector, at the national level.)

Other concepts and definitions

Activities: what is done within the scope of the project/activity; these should be concrete, visible to the public and under full control of the organization.

Outcomes: short-term direct and tangible results of each activity that are not under direct control of the organization; an activity can have several outcomes, and an outcome may be shared by several activities.

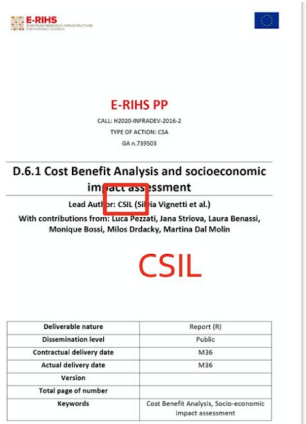
Impact: transformative effects of the activity on its target and beyond, in the short, mid and long term; (e.g. “Increased adoption of the FAIR principles among Portuguese researchers” and “More Portuguese datasets published” are reasonable impacts from the “Data management course” activity).

Other concepts and definitions

Evidences: the physical proof (e.g. “screenshot”, “report”, “graph”, “tables”, “narrative”, “lists”, “pictures”, etc.

Methods: the way indicators will be measured, including instruments (e.g. “attendance sheet”, “survey”, “questionnaire”, “interview”) and techniques (e.g. “counting”). Narratives, testimonies and other qualitative methods are also acceptable if adequate.

Assessing impact of RIs: ELIXIR


E-RIHS

E-RIHS PP

CALL: H2020-INFRADEV-2016-2
TYPE OF ACTION: CSA
GA n.739503

D.6.1 Cost Benefit Analysis and socioeconomic impact assessment

Lead Author: CSIL (Silvia Vignetti et al.)
With contributions from: Luca Pezzati, Jana Strivova, Laura Benassi, Monique Bossi, Milos Drdacky, Martina Dal Molin

CSIL

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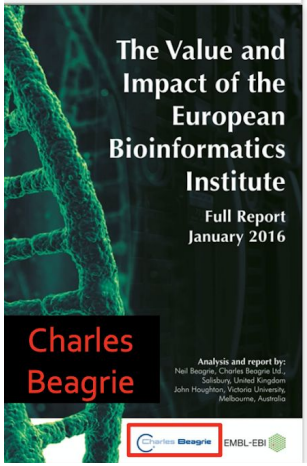


Subcontract *impact evaluation* to the experts...

← ↙ ↓


Milan Summer School on Cost-Benefit analysis

↑ ↗

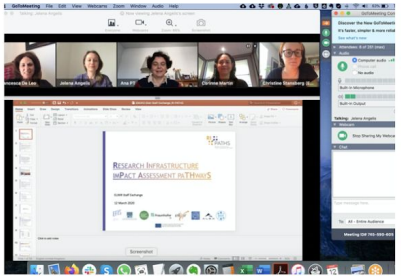
... or build your internal capacity in *impact evaluation* →

↘


Screenshot

*ELIXIR **learned**, guided by the RI-PATHS impact evaluators* →

RI PATHS



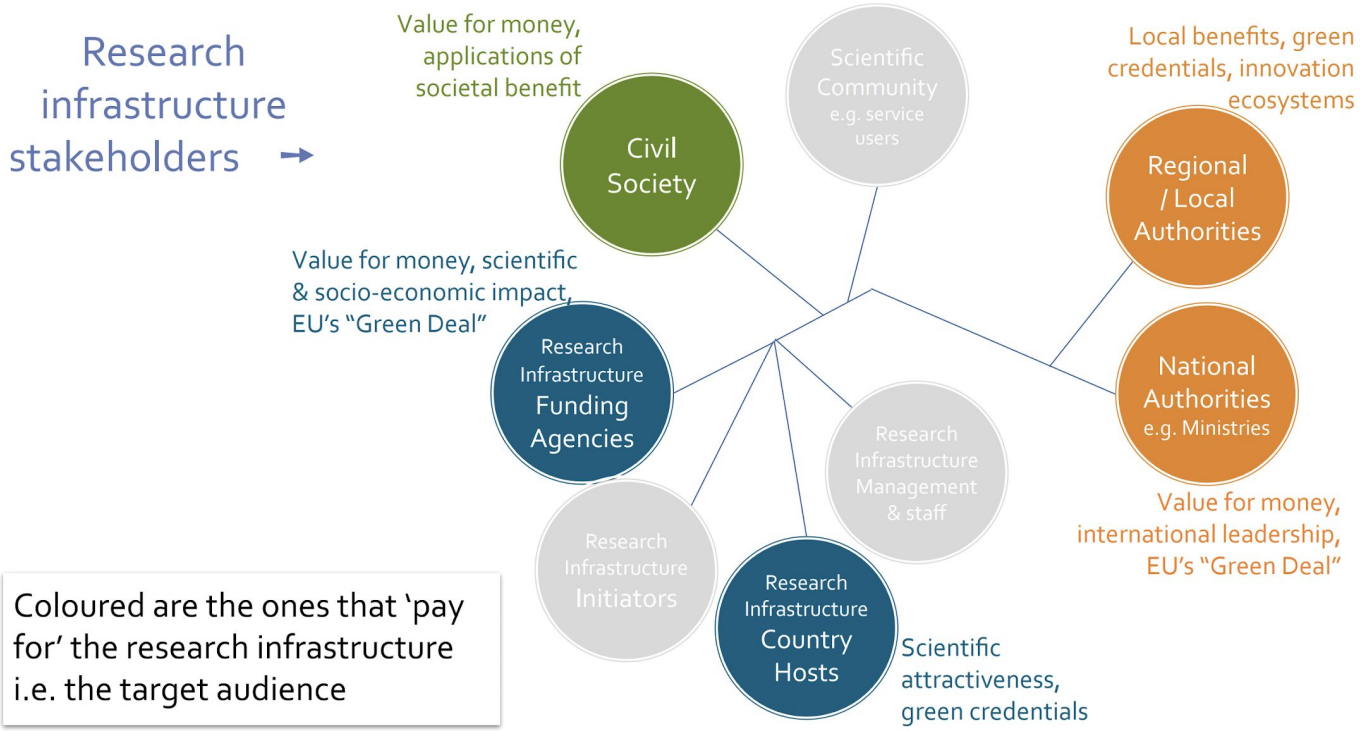
Lisbon Workshop: "Impact Assessment at the National Node Level"

Bari virtual Workshop: "Embedding Nodes' perspectives to strengthen impact assessment capacity and approaches"

From Martin, C and Smith, A (2020) RI-PATHS Webinar "Piloting the RI-PATHS approach @ ELIXIR - How we did it"

Assessing impact of RIs: ELIXIR

Your audience has specific interests



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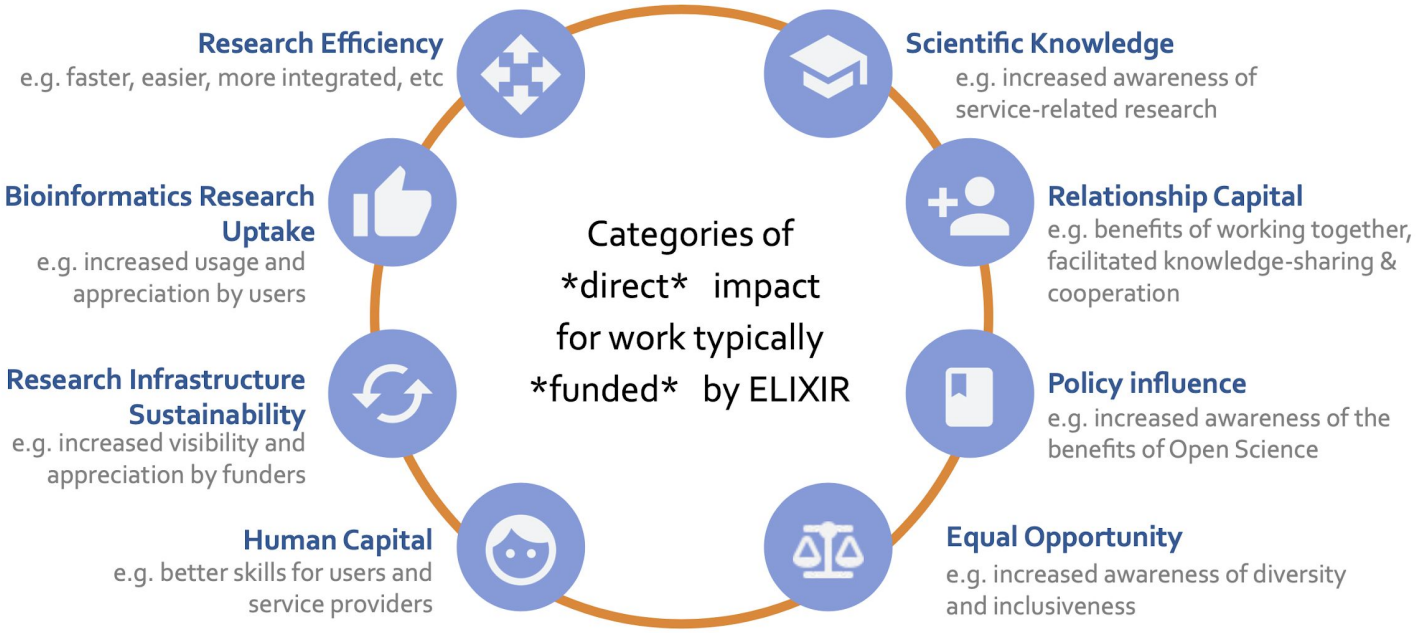
Assessing impact of RIs: ELIXIR

Articulate your areas of impact



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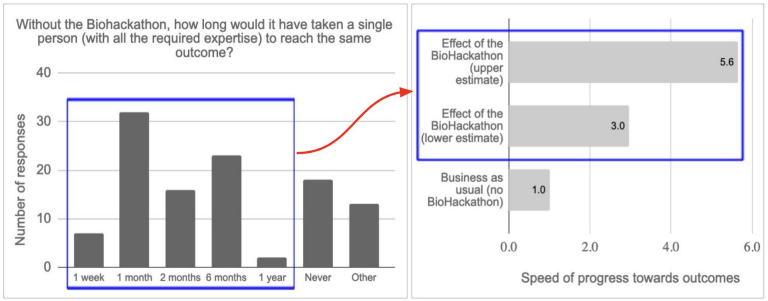
Assessing impact of RIs: ELIXIR

Collect / collate evidence against each impact area

Research efficiency is also a major area of impact for ELIXIR



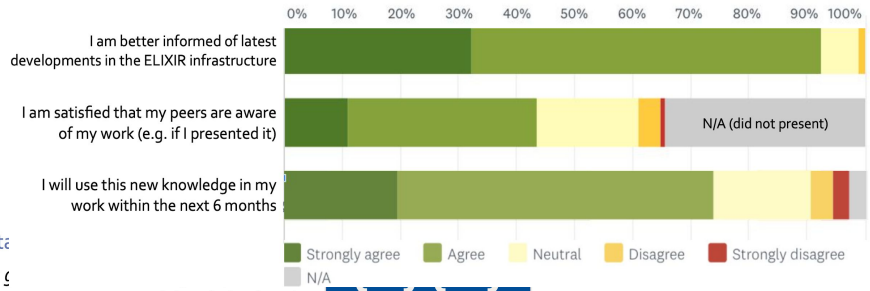
ELIXIR Biohackathon 2019:

- **Acceleration** towards outcomes by a factor of 3 to 5
- "*I would **never** be able to achieve the same outcome without the help received during the event*" — 16 % of respondents (N = 111)

Scientific knowledge, i.e. sharing of **service-related** research findings

ELIXIR All Hands Meeting:

- Annual cost to ELIXIR > €100k (in-person version)
- >300 participants from 23 "ELIXIR country Nodes" and special guests
- Personal outcomes as a result of attending the 2020 virtual edition (N = 108 respondents)



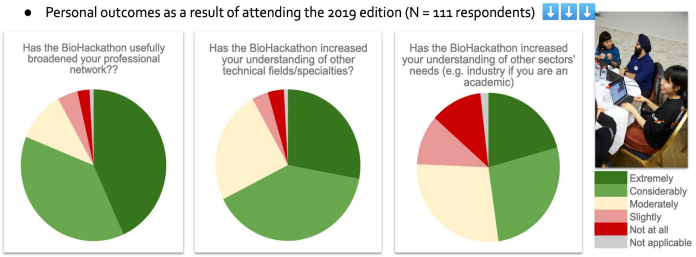
Relationship capita

... or " *The whole is g*

— Aristotle (perhaps)

ELIXIR Biohackathon:

- Annual cost to ELIXIR > €100k
- >150 participants, >30 hacking projects, 5 days
- Personal outcomes as a result of attending the 2019 edition (N = 111 respondents)



Use also of narratives, testimonies and other qualitative indicators.

From Martin, C and Smith, A (2020) RI-PATHS Webinar "Piloting the RI-PATHS approach @ ELIXIR - How we did it"

Assessing impact of RIs: ELIXIR

And what about the national node level?

We develop **approaches to assess impact of Node activities** based on existing frameworks (OECD, ESFRI, RI-PATHS), and according to node specificities and resources.

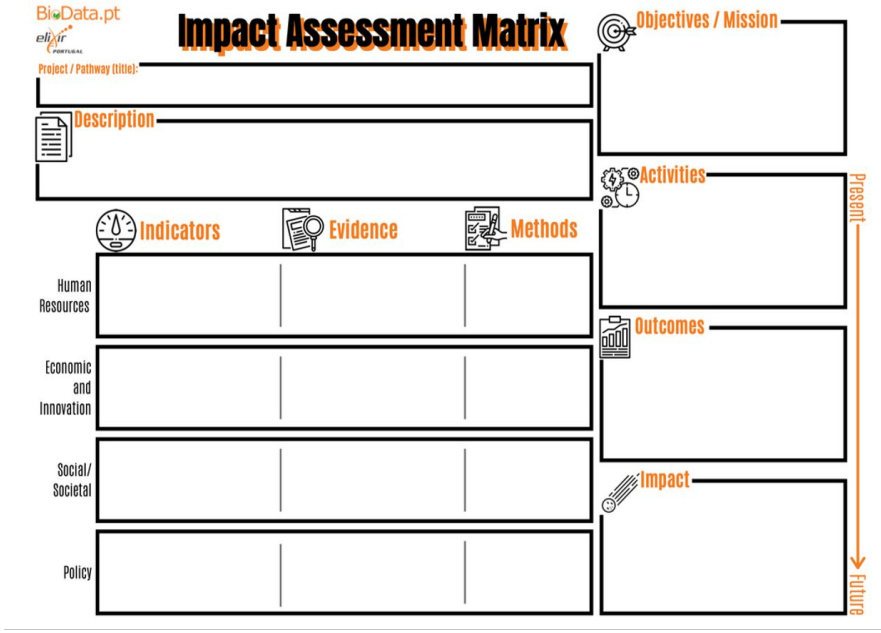
We also ensure that the indicators are chosen suiting national nodes characteristics.

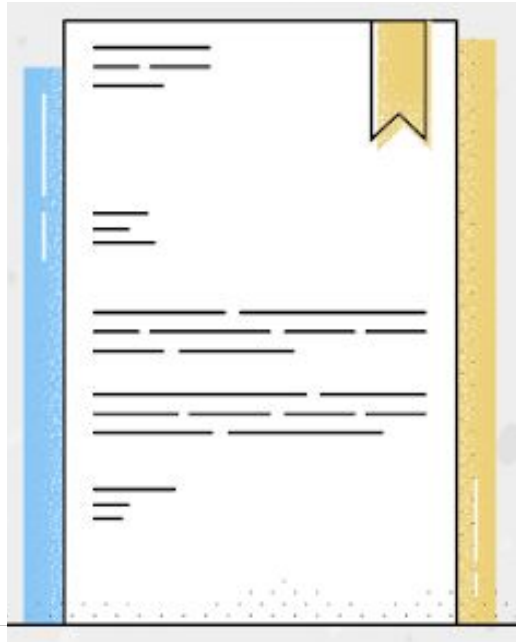
ELIXIR Staff Exchange Programme

Empowering ELIXIR Nodes to measure and communicate their performance and impact

Assessing impact of RIs: ELIXIR

And what about the national node level?





ELIXIR PT developed this participatory exercise

Canvas/Guideline/ workshop

Take Away

- Assessing the socio-economic impact of your research takes you beyond scientific results.

- There are many tools to help you perform socio-economic impact assessment of your research.

- Engage with your peers to tailor your process.

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ELIXIR staff exchange programme

WP4