

Monitoring of Research Infrastructures

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Monitoring and Key Performance Indicators (KPI)

- Performance monitoring is an **obligatory** activity for many publicly-funded bodies and initiatives.
- KPIs **monitor performance against objectives**
- Enable **evidence-based decision making**
- Contribute to **communication** of achievements
- Contribute to the **impact assessment** and sustainability (usually performed by external experts)

Monitoring and evaluation at CERIC

- Annual monitoring using KPIs
- Results are reported to the GA and published in the annual report

Monitoring and evaluation at CERIC

Headline Indicators	2015	2016	2017	2018	% Change 2018-2017
Proposals received	108	119	195	234	20
Number of papers	4	21	36	51	42
Cumulative IF	11	122	182	312,9	72
Average IF	2,79	5,80	5,70	6,1	7
Projects' funding (CERIC)	0	21.323,00	382.159,75	476.114,64	25
Invited talks (reimbursed)	6	10	18	14	-22
Students and researchers trained	30	79	126	282	124

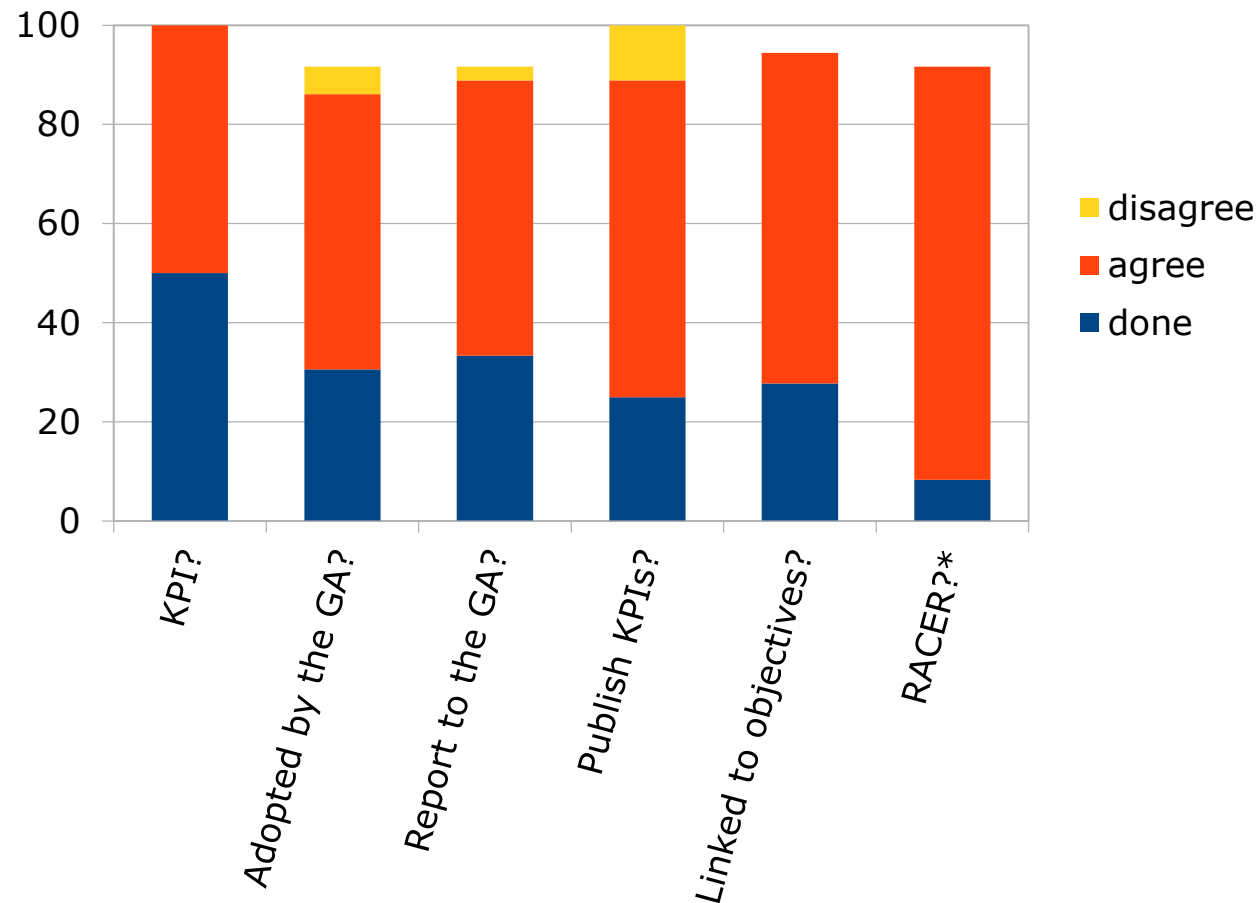
Monitoring and evaluation at CERIC

- **Annual** monitoring using KPIs
- Results are **reported** to the GA and **published** in the annual report
- Every 4 years each **facility** is **evaluated** by international experts
 - Recommendations to the facility
 - Recommendations to the institution
 - Recommendations to the Ministry
- Every 5 years there is **evaluation of societal impact**
 - Methodology developed this year within ACCELERATE project

Monitoring and evaluation are an essential contribution to sustainability.

What is the current situation in RIs?

- **7 basic questions** relating to the use and properties of **KPIs** were asked
- **36 RIs** replied



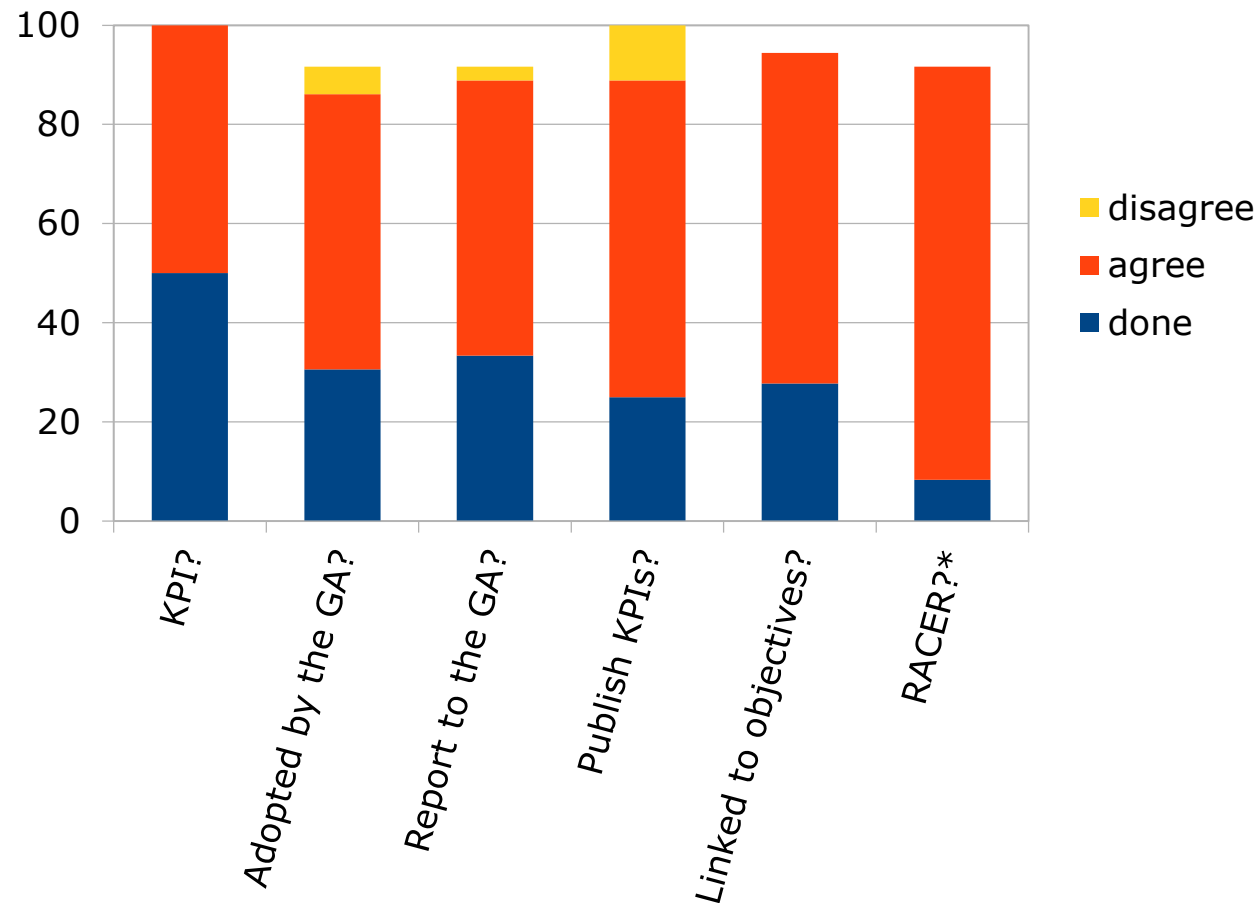
*RACER
Relevant
Accepted
Credible
Easy to monitor
Robust

RACER Properties of KPIs

- Relevant – i.e. closely linked to the objectives to be achieved
- Accepted – e.g. by staff and stakeholders
- Credible for non-experts, unambiguous and easy to interpret
- Easy to monitor – e.g. data collection should be possible at low cost
- Robust – e.g. against manipulation

What is the current situation in RIs?

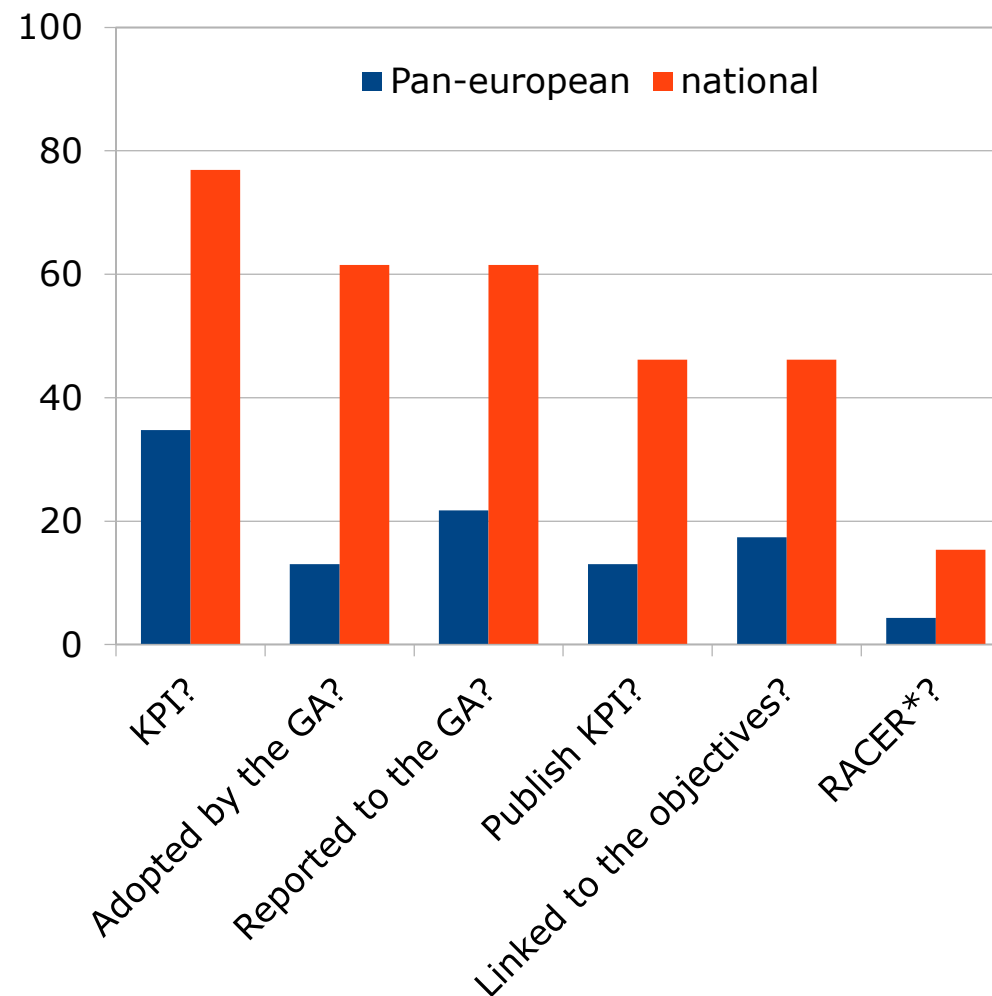
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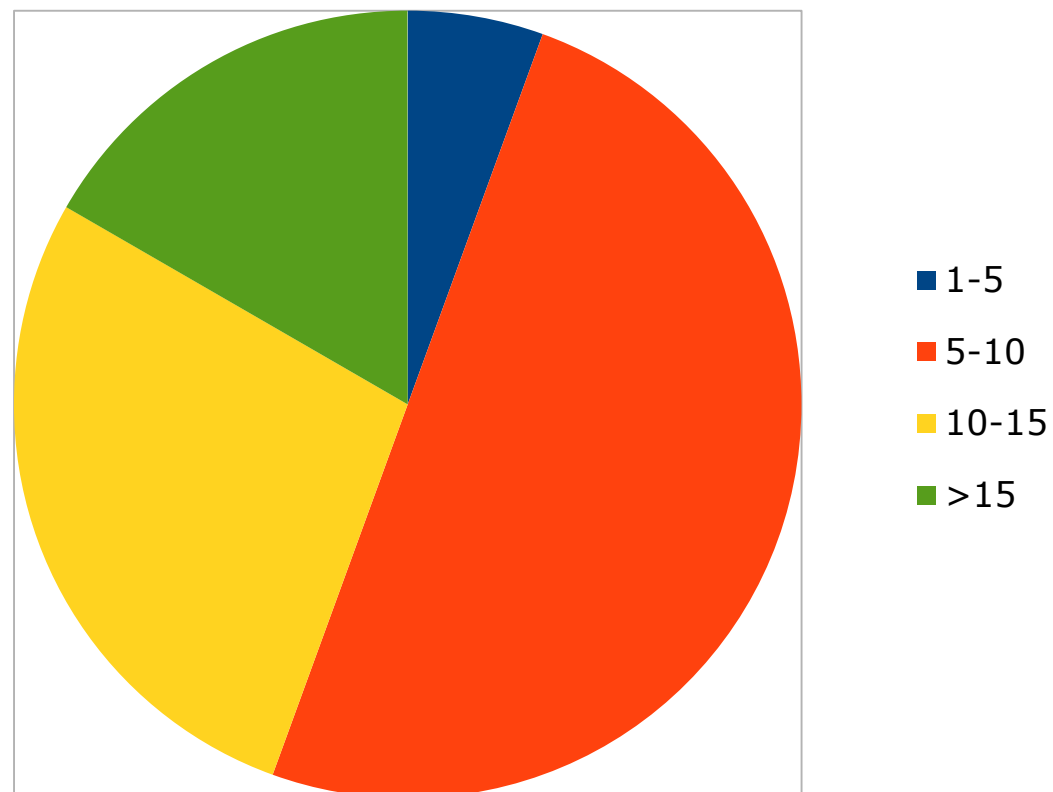
- 23 pan-European RIs
- 13 national



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What is the current situation in RIs?

Number of KPIs?



Comments

- Importance of putting KPIs into **context** when making them available publicly to ensure clarity.
- Warning against prescribing the use of **the same indicators by all RIs** in a ‘top-down’ approach.
- In addition to quantitative KPIs, attention should also be devoted to **non-measurable, qualitative performance criteria** and propose that
- **KPIs to be accompanied by case studies and other narratives** in order to appropriately present progress in the pursuit of the objectives of their infrastructure.

Monitoring and assessment of Ris in EU

- Sustainable European Research Infrastructures, A Call for Action', Action 6 '*assess the **quality and impact** of the RI and its services, by developing a set of Key Performance Indicators, based on Excellence principles*'
- Conclusions of the BG presidency Conference on RIs in 2018 : '*there is a need for **systemic monitoring and impact assessment** of pan-European Research Infrastructures.*'

Competitiveness Council

- Invites *‘Member States and the Commission within the framework of ESFRI to develop a **common approach for monitoring** of their performance and invited the pan-European Research Infrastructures, on a voluntary basis, to include it in their governance and explore options to support this through the use of **Key Performance Indicators**’*

ESFRI and EC approach

- **ESFRI**

- Expert group on **monitoring**

- **EC**

- **HL expert group to assess the RI progress** towards implementation and long term sustainability
 - methodology in preparation,
 - assessment in autumn 2019
- RI-PATHS project: Charting **impacts pathways** of investment in RIs

H2020/Interreg funded projects addressing the topics: Accelerate, ERIC-FORUM, RESINFRA

ESFRI WG on monitoring of RIs performance

- Chair Peter Wenzel-Constabel (BMBF), vice chair Andrew Harrison (Diamond)
- The Working Group is expected to **deliver by late 2019**:
- **1. A concept of a common approach for the monitoring of RI** performance, including the periodic review of ESFRI Landmarks.
- **2. A matrix with a core set of KPIs** that could be applied across the different RIs.
- **3. Rationale for the development and optimization of KPIs** for specific Research Infrastructures.
- **4. Recommendations aimed to facilitate the inclusion** of the monitoring of RI performance, also by using adapted Key Performance Indicators, in the **governance of RIs**.

Slides about the output of the WG are based on publicly available information, in particular, A. Harrison, Interim report of the ESFRI Monitoring WG, ERIC Forum Meeting, Oslo, May 7-8th 2019

Previous studies

- **ESFRI IG monitoring** of 2008 and 2010 ESFRI Projects (2012)
- **ESFRI Expert Group report on ‘Indicators of Pan-European relevance of Research Infrastructures’** (2013)¹
- **Questionnaire to 4 ESFRI Landmarks** (2016)
- **OECD ‘Reference Framework for Assessing the Socio-Economic Impact of Research Infrastructures’** (2019)²
- **CERIC survey of the objectives of all ERICs**, as described in their Statutes, identifying how many of the ERICs share certain objectives ³

1 - https://ec.europa.eu/research/infrastructures/pdf/FI13_46_14_ESFRI%20Indicators_report_4.pdf

2 “Reference framework for assessing the scientific and socio-economic impact of research infrastructures”, OECD Science, Technology and Industry Policy Papers, No. 65, OECD Publishing, Paris (2019) - <https://doi.org/10.1787/3ffee43b-en>

3 – Available from CERIC (2018)

Is it too ambitious to have a set of KPIs for all Ris?

Some variations between Ris:

- Single sited & distributed
- Young & established
- All scientific disciplines



Objectives of ERICs - training

GENERAL

- fostering **education** (EPOS)
- to support **training programmes** (LIFE-WATCH)
- to facilitate **teaching and learning in the social sciences**, to initiate training activities and exchanges between established and potential Service Providers (CESDA)
- to provide **training** in integrative techniques in the field of structural biology (ISTRUCT)

SPECIFIC GROUPS

- ...joint training of **scientific and technical personnel and young researchers** (CERIC)
- provide training and facilitate mobility of **researchers** ...(BBMRI)
- promote training of investigators **and all categories of professionals and lay persons** (ECRIN)
- integration of training; coordinated training of **scientists, engineers and users**.(EMSO)
- training facilities and courses for **researchers and technical personnel** (EMBRC)



ACCELERATE

Common objectives of RIs?

CERIC survey of objectives of ERICs (2018)

- Scientific excellence (100%)
- Education and training (50%)
- Facilitating regional and transnational collaboration and activity in Europe (70%)
- Innovation and knowledge transfer (70%)
- Data (60%)
- Outreach to public and policy makers (70%)
- Providing scientific support to policies and standards (60%)
- International co-operation (45%)
- Governance, management and optimum use of resources (40%)

Proposed KPIs of the ESFRI WG on monitoring

- Scientific excellence (4)
 - Number of proposals/requests submitted
 - Number of proposals/requests accepted
 - Number of publications
 - Quality of publications
- Education and training (3)
 - RI staff training hours
 - Number of PhD/MSc students
 - User training hours
- Regional and TN activity in Europe (3)
 - % budget for multi-partner activity
 - Number of European members
 - % users and publications from European countries

Proposed KPIs

- Innovation and knowledge transfer (2) % publications with industry
% revenue from commercial activity
- Data (1) Number of data sets used externally
- Outreach to public and policy makers (2) Reach of RI activity through external media
Engagement with RI's website and social media
- Policies and standards (2) Participation of RI in policy-related activities
Number of citations of RIs in policy related publications
- International co-operation (2) % research projects with partners outside the EU
International training hours

WG on monitoring – ongoing & future activities

- **Comments** were collected from ESFRI
- Not all KPIs are **equally relevant** for all RIs – **questionnaire** in June 19
- **Draft Reference sheets** developed for each KPI
- **Monitoring methodology** being developed (work in progress)
 - KPIs and should not be used to compare across RIs
 - RIs to provide a short narrative for each KPI, giving their context
 - The KPIs to be reviewed after a few years
- **Assessment methodology** with external experts is being discussed
- Stakeholder **workshop** on July 3rd (ESFRI delegates and pan-EU RIs)

Q&A after the presentation

- Are the objectives relevant for your RI?
- Are some general ones missing?
- How about the KPIs?
- Monitoring approach - any comments?
 - ESFRI to collect the KPIs from landmarks
 - KPIs adopted by ESFRI likely to be adopted by some MS

ESFRI and EC approach

- **ESFRI**

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HLG - assessment process

- **Critical mass and added value** of the RI and prospection of new members
- **KPI** and socio economic impact
- Catalogue of **services** and service driven approach
- User communities and outputs also in terms of **innovation** and TRLs
- **Capacity to maintain leadership and excellence** (RI & services)
- **Complementarity** of the activities of the RIs and possibilities for **consolidation** with related RIs
- Effectiveness of embedding **international** partners in the RI & cooperation

HLG - assessment process - coverage

- 48 research infrastructures
 - 11 ESFRI projects (18, excluding 2018 ESFRI and MYRRHA)
 - 35 landmarks (37, excluding PRACE & JHR)
 - 2 non-ESFRI ERICs

ESFRI and EC approach

- **ESFRI**

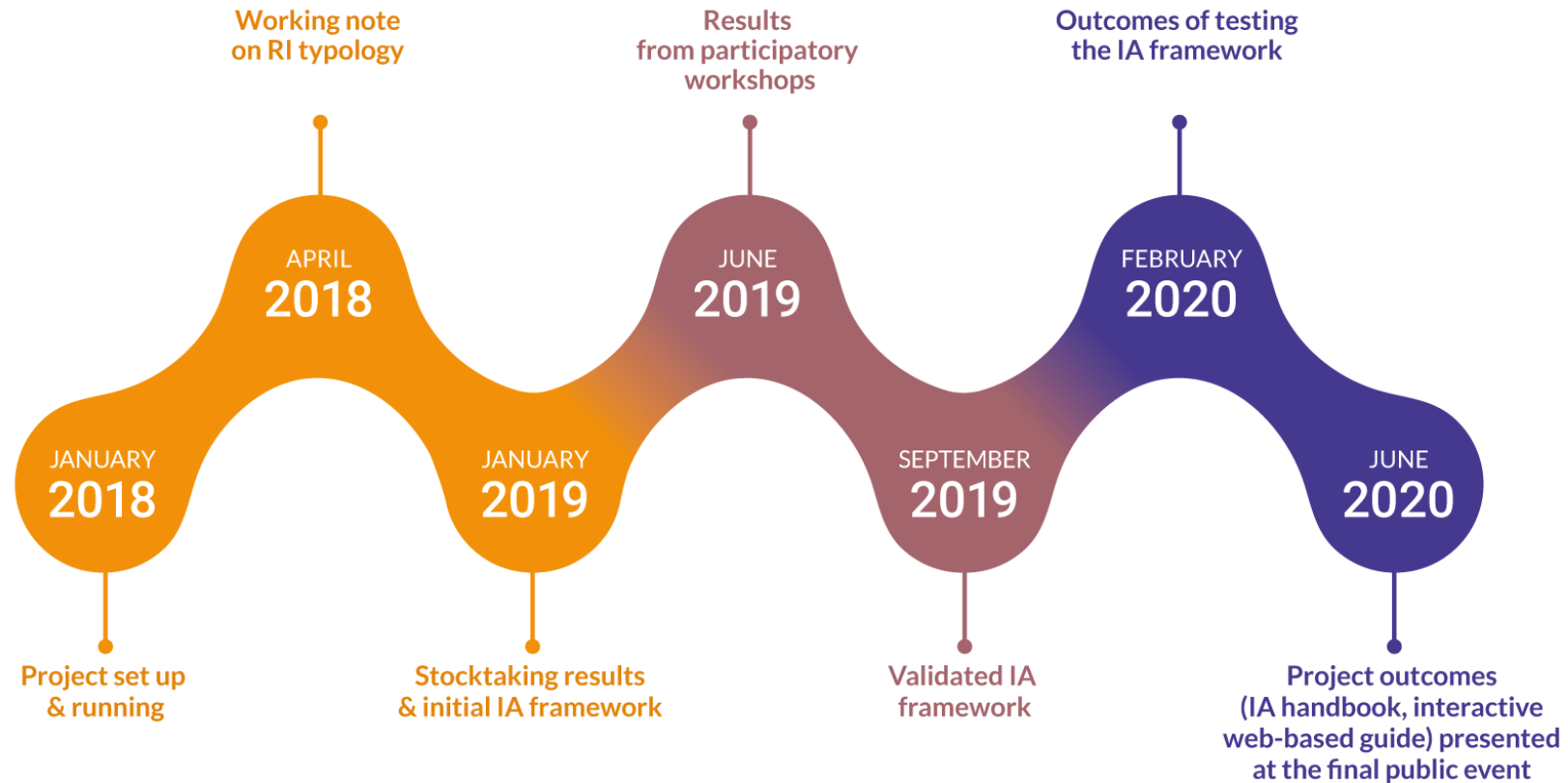
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RI-PATHS timeline



How to prepare for RI monitoring?

- The monitoring and assessment process is currently **still being designed**
- Set up/update the monitoring system using the **KPIs proposed by the Monitoring WG**, if appropriate. Start collecting data.
- Consider operational quality, as demonstrated by e.g.
 - Scientific & RI development strategy
 - Open access procedures
 - IPR policies, etc
- Consider developing the impact cases, e.g.
 - Scientific excellence
 - Training/capacity building
 - Industry
 - Policy, etc

Societal Impact (SI) Protocol - CERIC



Prepared by Rathenau Instituut¹ within Accelerate.

- Designed to support RIs in **anticipating, managing and monitoring their societal impacts** and to support them when preparing for a specific evaluation.
- Not an evaluation protocol
- Approach: Impact pathways based on Theory of Change
- A mix of indicators and context
- Aims
 - Report to the funders
 - Prepare for the SI evaluations
 - Design of a systematic monitoring process for SI
 - To enable the development of the SI strategy
- Benefits – involvement of the stakeholders, alignment of their goals & expectations

1. Leonie van Drooge, Isabelle van Elzakker, January 2019

Societal Impact (SI) Protocol - CERIC



Impact on the ERA

Goal or vision: a joint, shared European Research Area, extended to the EU neighborhood, with decreased research gap

Rationale:

Objective of CERIC:

Activities:

Results, Outcomes, Impacts:



Some topics for discussion

- Are the objectives of RIs mentioned relevant for your RI?
- Are some general ones missing?
- How about the KPIs?
- Monitoring approach - any comments?
 - ESFRI to collect the KPIs from landmarks
 - KPIs adopted by ESFRI likely to be adopted by some MS
- How do you prepare for monitoring?