NOTE #12

The complexity of monitoring and assessing RRI structural change implementation and impact in research organisations within biosciences

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RRI IMPLEMENTATION IN BIOSCIENCE ORGANISATIONS

GUIDELINES FROM THE STARBIOS2 PROJECT

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STARBIOS2 project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 709517.

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This section comprises a presentation of some key aspects of the monitoring and evaluation of the actual experience of promoting RRI structural change within research organisations in the STARBIOS2 project. The focus is on the role of monitoring and assessment in the design, implementation and impact of the actions and in particular on some critical issues in promoting RRI and triggering effective structural change processes.

In the last decades, evaluation of research and innovation has become a valuable instrument in policy-making within varied contexts as a means to use scientific knowledge to support decision making (Dahler-Larsen, 2006; Kalpazidou Schmidt, 2009). In the framework of the STARBIOS2project, RRI evaluation has been perceived as a wide-ranging concept and has been employed as an efficient instrument in not only monitoring and assessing the implementation and impact of actions but has also been utilized as a continuous learning tool for the involved actors. As a learning instrument, it has been used for design and strategy-development, process assessment (opening the black box of the implementation process and providing feedback to address emerging issues and redesign actions) to assure the maintenance of high quality levels in the implementation of the tailor-made Action Plans throughout the duration of the project. Hence, a formative, developmental dimension, providing basis for adjustment and formative learning along the process, has been incorporated in the monitoring and assessment efforts. Similarly, a summative evaluation of outputs,

outcomes and impacts has been carried out to assess the degree to which the actions achieved their objectives or created the crucial conditions for RRI structural change to occur.

The main objectives of the monitoring and assessment activities have been: (i) to examine and assess the process and progress towards the objectives of the actions, (ii) to provide input as to the quality of the activities during the implementation process (in a learning and formative perspective), and (iii) to assess the achievement of planned objectives and expected impacts, in a summative perspective. The monitoring and assessment activities contributed also to RRI knowledge exchange and mutual learning. The activities in the specific context of the STARBIOS2project have thus been:

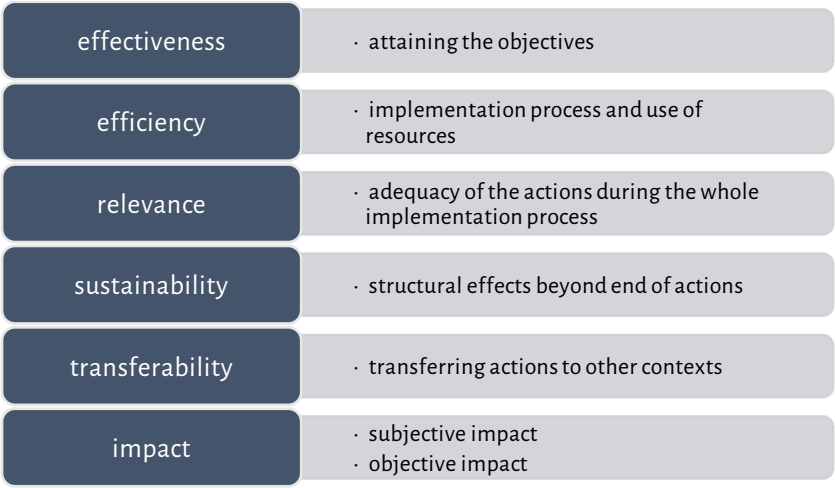
- Transversal: co-operation with all partners and facilitation of knowledge exchange.
- Communicative: identification of good practices, needs and potential benefits, encouraging critical self-reflection on the change process and the sustainability of the actions.
- Balancing an internal/external role and functioning as a critical partner, overseeing the flow of the Action Plans, mapping progress and enabling timely intervention.
- Accounting for the specificity of the project nature with distinct epistemic cultures and disciplines.
- Acknowledging the non-linearity of the transformation process.
- Considering the contextual conditions in complex, dynamic and adaptive systems.
- Adjusting evaluation design throughout the project to include emerging issues.

The internal role of the evaluators as embedded in the project provided the advantage of becoming acquainted with all actions in a high level of detail, aimed at utilizing this knowledge for the benefit of the implementation process, and allowed emerging issues to be addressed. This insight and understanding minimized the risk of an overly ethnocentric perspective with limited ability to capture the complex context-sensitive aspects of the implementation process in each Action

Plan in its cultural, institutional and national setting (Kalpazidou Schmidt & Cacace, 2017 and 2018). At the same time, innate in the evaluative task lay also an imperative to take on a more distanced perspective in order to allow for an independent assessment of the sufficiency of the project's development and progress. The monitoring and assessment standpoint mimicked an outside view and thus avoided "going native" (Lindlof, 1995) but functioned in a deeply committed participatory way.

In performing the monitoring and assessment of the RRI structural change actions, the criteria of *effectiveness* (attaining the objectives), *efficiency* (the implementation process, use of resources, managerial capacity), *relevance* (adequacy of the initiatives during the whole implementation process), *sustainability* (structural effects beyond the end of Action Plans), *transferability* (transferring actions to another context) and *impact*(short-, medium- and long-term impact)have been adopted (Kalpazidou Schmidt, 2016). Impact has been articulated in terms of *subjective* impact and *objective* impact (Figure 1).

Figure 1. Monitoring and assessment criteria



Subjective impact addressed the degree of approval among the beneficiaries of the various activities in the Action Plans, as well as the capacity to promote consensus about the activities among actors internal to the institutions, such as the staff and leadership, but also externally, reaching stakeholders from the local and/or national community. *Objective impact* referred to the effects obtained in terms of actual change within the implementing institutions, which may be expressed in numerical terms, but may also have a cultural, organisational or policy character, expressed in qualitative terms. Such impact may involve improved open access practices, increased share of women in senior and decision-making positions, change in the programmes, policies or work procedures of the institutions, adoption of the Action Plans processes and results by other R&I organisations or by subdivisions of the research institutions not initially involved in RRI activities. Objective impact may also comprise the creation of conditions that enable activation of further change processes.

As a first step in the assessment process, the strategic scope of the actions was scrutinized by examining the specific set of issues addressed and understanding them in relation to the particular contextual conditions and the objectives pursued by each RRI implementing organisation. The types of expected impacts were: (i) in the short-term, improvement of the uptake of RRI in the implementing research institutions; (ii) in the medium-term, production of tangible and measurable results in terms of organisational processes and structures, and making institutional change scalable to other institutions in the ERA; and (iii) in the long-term, increasing the ability of research institutions to generate innovation that reflects societal needs.

The monitoring and assessment activities have been performed on the basis of information derived from documents, information and data provided by the implementing teams and other stakeholders (such as other actors and beneficiaries); periodic bilateral monitoring sessions; various reporting activities and

information collected through monitoring schemes; mutual learning sessions; steering committee meetings; a range of bilateral *ad hoc* communication activities (such as support in developing survey questionnaires, evaluation templates, etc.); sessions with the coordinator and the technical-assistant partner; and on-site visits to the implementing institutions.

RRI structural change assessment in context

Besides the formative and summative elements, the monitoring and assessment activities aimed at, in a learning perspective, opening the black box of the space between the initiation of the actions and the impact by closely following the process of implementation to understand "what works better for whom in what circumstances, and why" (Pawson & Tilly, 1997).

Assessment of RRI implementation involves a range of challenges since RRI actions, themselves being complex, are carried out in complex environments. Such challenges comprise *attribution* problems (the effects of which are directly linked to the implementation of actions and how change has occurred), *measurement* problems (understanding the dynamics in complex contexts, availability of data and information, comparability of results, etc.), and *timing* problems (time lag from implementation until the generation of outputs and outcomes so that impact can be assessed).

Establishing a causal link between the RRI actions and the observed impacts requires the attribution of the observed change to the actions. However, in reality, implementations of complex concepts, such as RRI, in complex contexts, such as research institutions, make such pursuits challenging (cf. Cartwright & Hardie, 2012; Dahler-Larsen, 2012). The ability of RRI actions to foster the right conditions for change is therefore central in implementations in complex contexts (Reale et al., 2014), and impact assessment has to consider whether sufficient "conditions for impact" are created (Kalpazidou Schmidt & Cacace, 2017; Kalpazidou Schmidt et al., 2019). Thus, the following features have to be taken into account in complex system evaluations:

- RRI structural change actions are implemented at multiple levels in contexts that are complex, dynamic and adaptive.
- Complex systems involve multiple variables interacting in non-linear ways to produce outcomes and impacts.
- RRI is itself a complex concept implemented in complex systems.
- Establishing causal links between RRI actions and their effects pose a range of theoretical and methodological challenges.
- Complex systems respond to changes in the environment and adapt to new conditions – structures and cultures are resistant to change.
- The increased probability of change is part of the desirable effect of complex interventions (Kalpazidou Schmidt & Cacace, 2017).

A range of hybrid approaches seeks to address the above-mentioned challenges. One way to mitigate the risks connected to evaluation of RRI implementation is to use theory-based evaluations. Theory-driven evaluations focus on the questions: in which way and under which conditions a policy intervention causes the documented intended and unintended effects (Döring & Bortz, 2016). Theory-based approaches imply that the assessed variables are selected according to a theory that formulates implicit or explicit assumptions about interventions and their expected impact (Chen, 2012). Key elements in theory-based evaluations are (i) the design of an intervention theory and the theory of change of a particular intervention and (ii) the empirical investigation of the intervention theory. Such evaluations explore "not only whether the intervention works, but also how, for whom and in which context" (Van Belle et al, 2010). Understanding the contextual conditions not only enriches the assessment but may also support replication and generalizability of the outcomes of implementations (Rog, 2012).

Overall, to address the challenges related to monitoring and assessment of RRI structural change implementations some concrete lines of action are proposed: (i) adoption of a holistic approach that considers the constantly emerging needs; (ii) creation of a highly tailor-made monitoring and assessment design

involving all the stakeholders; (iii) incorporation of RRI action monitoring and assessment from the beginning in the process; (iv) the ability of RRI actions to foster the right conditions for change has to be central in dealing with the complexity of the systems; and finally (v) a theory-based evaluation approach may help mitigate the risks related to monitoring and assessing RRI implementation and support replication.

ABOUT THE STARBIOS2 GUIDELINES

This guideline aims to help readers formalize and trigger structural change aimed at introducing appropriate RRI-related practices to their own organisations. This is not a series of prescriptions, but an itinerary of reflection and self-interpretation addressed to different actors within the biosciences. To support this itinerary of reflection and self-interpretation, the document provides...

- a description of a general RRI Model for research organisations within the biosciences, that is a set of ideas, premises and "principles of action" that define the practice of RRI in bioscience research organisations,
- some practical guidance for designing interventions to promote RRI in research organisations in the Biosciences, putting into practice the RRI Model,
- a set of useful practices in implementing the structural change process,
- and information on particular STARBIOS2 cases and experiences, as well as materials, tools and sources, are also provided in the Appendix and in the Annex.