Session P1

Value-driven Technologies: Role concepts in Technology Assessment and Responsible Innovation

Chairs: Armin Grunwald (Institute of Technology Assessment and Systems Analysis), Rene von Schomberg (European Commission)

Role concepts have been accompanying many conceptual discussions in Responsible Innovation (RI) and Technology Assessment (TA). Several questions and controversies arise because RI and TA are operating at interfaces between science, engineering, policymaking, the economy, and the public: who is mandated for what in the complex processes of assessing and shaping technology, how should the division of labor be organized among different actors, how transformative may or shall RI and TA be, and so forth. Proposals for adequate role concepts include the positivistic picture of the value-neutral knowledge-provider, the distant observer, the normative advisor, the issue advocate in terms of sustainable technology and fair innovation, the creator of right impacts, the facilitator of public debates, and the honest broker developing alternative options.

In this session, we focus on the spectrum of roles of TA and RI in driving the technological advance according to human values. We distinguish between two types of values:

- Substantial values for shaping technology and innovation (e.g. according to the imperative of sustainable development)
- Procedural values for designing the processes of development and innovation (e.g. according to values of transparency and democracy)

Brief input statements will introduce different role concepts for innovation actors and technology assessors in RI and TA, which shall initiate on open and lively debate with the audience.

Roles of technology assessment for assessing value-laden technologies

Author: Armin Grunwald (Institute of Technology Assessment and Systems Analysis)

Technology Assessment (TA) is operating at interfaces between science, engineering, policymaking, the economy, and the public. Because technologies are not value-neutral several questions arise: who is mandated for what in the complex processes of assessing and shaping technology, how should the division of labor and responsibility be organized among different actors, how transformative may or shall TA be, to what extent is TA mandated to take a stand in value affairs, and so forth. Answers to these questions influence the roles TA shall or may take in assessment processes and technology debates.

Different background theories about the relation between politics, the public, engineering, and science give rise to different role concepts. Proposals for adequate role concepts of TA include the positivistic picture of the value-neutral knowledge-provider, the STS idea of distant interpreters, the normative advisor promoted by some approaches to Applied Ethics, the issue advocate in terms of sustainable technology and fair innovation, the creator of right impacts, and the honest broker developing alternative options without taking a normative stand.

In this paper, a novel approach to the design of role concepts of TA will be presented. It builds on a recently developed conceptual framework of technology assessment rooted in pragmatist approaches developed by John Dewey and Jürgen Habermas. This perspective on TA has specific

implications for assessing value-laden technologies. It requires the inclusion of knowledge, values and perspectives of stakeholders, people affected and citizens in TA-processes, as well as developing or strengthening thinking in alternative options.

Applying this framework to the issue under consideration leads to a two-fold answer to the question for role concepts of TA. First, TA has to stick to the role of the Honest Broker of Policy Options in the terminology of Pielke. In assessing value-laden technologies, TA must not take a stand with regard to specific technological options because this could violate its commitment to broad value inclusion. However, the role of the Honest Broker does not exhaust in serving as a distant and neutral moderator of debates among actors involving diverse options. Bringing forward 'good arguments' for or against specific technologies is compatible with the role of an honest broker. 'Good arguments', however, must build on the quality of the assessment process in accordance with the TA framework mentioned above under the commitment of inclusion. Hence, TA's assessment process itself is decisive in this respect.

Second, TA may act as an Issue Advocate in cases where its own foundations are touched. Building TA on normative concepts of discourse and deliberative democracy like in the TA framework presented in this paper implies that TA is obliged to act as an Issue Advocate with respect to democracy and to discourse ethics.

Responsible Innovation: Allocation and re-allocation of roles for innovation actors

Author: Rene von Schomberg (European Commission)

Responsible Innovation fills the gaps created by the deficits of the current (global) research and innovation system: existing market failure to deliver on societally desirable innovation outcomes; lack of open research and scholarship; lack of normative design of technologies and foresight. I will shortly describe the deficits which are derived from the exclusive focus on risk and safety issues as state responsibility, the lack of any public governance of outcomes of research and innovation and the non-alignment of public values under public research and innovation policies that overemphasize the macro-economic benefits of innovation

Together these deficits form the basis for a plea for responsible innovation to be embedded in public policy and thereby re-allocates foresight and technology assessment mechanisms from the evaluative contexts of post market-introduction of innovations and technologies towards a new context of normative design and foresight in policymaking.

Furthermore, in order to address effectively the grave existing market failure to deliver on societally desirable transformative innovation outcomes underpinning sustainable development in it is interrelated economic, social and environmental dimensions, public-private partnerships have to be created by stakeholders committed to deliver on societal desirable objectives and sharing co-responsibility for its design. I will make the case that this is best achieved by public-private partnerships among broadly composed research and innovation coalitions which operate on the basis of open scholarship.

I will provide the example of Precision Agriculture as a case that still provides the opportunity for normative design and foresight in a new policy making context that extends and allocates responsibilities to others actors for the public value-sensitive design of new technologies which will give some steer to the direction of innovation.

Value-driven technology assessment – then, now and in the future

Author: Helge Torgersen (Institute of Technology Assessment)

Despite its frequently declared emphasis on neutrality (which is often understood as being essentially instrumental), technology assessment emerged from, and has always been predicated on, a number of not only procedural but also substantial values, manifesting in concepts such as democracy with regard to power, enlightenment with regard to epistemology, social justice with regard to societal relations etc. Together, they have embodied in the quest for a more transparent and equitable technology policy. This set appeared remarkably stable over time although the role of TA within the innovation ecosystem diversified from its earliest incarnation at the US Congress, through various manifestations at European parliaments, academic institutions and independent think tanks to today's institutional practices in policy advice and applied research on science and technology.

Over recent years, scholars have warned against a growing distrust in experts and science in the wake of populist political movements, which also may pose a challenge to the business model of TA. After all, TA aims at providing independent fact-grounded expertise, though not solely from experts but also from "ordinary citizens" through participatory methods. Yet the advice remains firmly grounded in the above values, which do not always appear compatible with increasingly populist tendencies. As a suitable answer, some scholars proposed to re-consider, and consistently lay open, particular substantial values in order to re-orient the role of TA in innovation. Accordingly, TA needs to "speak out" and declare what it stands for with every issue it takes up, and to promote those solutions that are more in accordance with TA's value base. Others consider taking an open stance to be impossible for TA – provided it is firmly yet implicitly grounded in the traditional set of values of TA – as they deem neutrality essential for procedural reasons, to pursue TA's functions in research and policy advice. A main argument is that TA needs to be inclusive, and accordingly, inclusiveness requires equidistance to the positions expressed on a certain issue. Procedural values may therefore clash, in some instances, with substantial values.

Thus, (at least) two avenues open up for TA in the future: one involving a clear and explicit substantial positioning, which appears more oriented at an activist mindset. Another path would center on procedural neutrality and thus resemble a more traditional scientist position, on a substantial value basis that remains implicit in daily practice. With regard to the assessment of future value-driven technologies, this paper will discuss which one may look more promising, whether there are other options available and what they may look like. After all, and since TA has survived many storms so far, maybe we just need to look on the variety of established practices to find an answer.

Organizing for transitions in the research system; understanding the drivers for RRI

Author: Ellen-Marie Forsberg (Ostfold Research) and Christian Wittrock (Oslo Metropolitan University)

Responsible Research and Innovation (RRI) is sometimes described as an approach to research and innovation where societal actors work together during the research and innovation process to better align both the process and its outcomes, with the values, needs and expectations of the European society.[1] Research funders, such as the European Commission, have devised programmes to

[1] https://ec.europa.eu/research/swafs/index.cfm?pg=about [accessed August 2017]

encourage the spread of RRI practices in research and innovation organisations, aiming to support policy implementation. Such programmes can make use of cultural, structural and environmental drivers for RRI in the research and innovation systems.

In the Horizon 2020 RRI-Practice project[2] we studied and supported implementation of RRI in 23 organisations in 7 European and 5 non-European countries. The project approached RRI in the shape of an overall, integrative philosophy about the transformed relation between science and society, as the process dimensions (inspired by AIRR[3]), as the EC keys, and finally through related concepts used in the countries and organisations studied. While each of these elements of RRI has their specific drivers, barriers, and good practices, common drivers and barriers exist across the elements of RRI.

When implementing RRI in organisations, it is important to make use of drivers to overcome barriers in order to facilitate organizational change. We have identified a number of good practices where RRI champions – or simply visionary leaders – have worked with the drivers to creatively overcome barriers.

Based on comparative organisational work in the RRI-Practice project, this contribution describes and discusses the most important drivers for implementing RRI related policies and practices in research conducting and research funding organisations. We discuss drivers related to organisational structures, pressures from the environment (interchange drivers) and cultural drivers, including how they interact. We discuss the findings in the light of neo-institutional theory.

[2] Responsible Research and Innovation in Practice (RRI-Practice), funded by the European Commission Horizon 2020 Science-with-and-for-Society programme (grant no 709 637). www.rri-practice.eu.
[3] We adopted the approach to process dimensions used in the RRI-Tools project: Diverse & inclusive, Anticipative & Reflective, Open & Transparent, and Responsive & Adaptive to change.