


RESEARCH ARTICLE



Advantages and disadvantages of societal engagement: a case study in a research and technology organization

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ABSTRACT

We view Societal Engagement (SE) as a key element of Responsible Innovation (RI) and want to better understand the advantages and disadvantage of SE, both in theory and in practice. Moreover, we are interested in the role that Research and Technology Organizations (RTOs) might play in bridging the gap between fundamental research in academia and applied research, development and deployment. We reviewed relevant literature in order to identify and discuss the *potential* advantages and disadvantages of SE, and conducted a case study of one SE initiative within a RTO in order to understand the advantages and disadvantages of SE in *practice*. The paper closes with a discussion of responsibility and ethics that the organizing of SE would require.

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Introduction

Much scholarship on Responsible Research and Innovation (RRI) and Responsible Innovation (RI) has focused on work being done in university environments. Only fairly recently, attention has started to move also to work being done in private, governmental or civil society sectors (Fisher 2019) (e.g. Lubberink et al. 2017, 2019; Ahrweiler et al. 2019; Brand and Blok 2019; Long et al. 2020; van de Poel et al. 2020). This move is fortunate, because both efforts in fundamental *research*, typically done by academia, and efforts in *innovation*, applied research, development and deployment, typically done by industry, government and society, are needed to realize the overall ambition of RRI/RI: to align *research and innovation* with the values, needs and expectations of society.

Below, we are interested in the role that Research and Technology Organizations (RTOs) might play in this overall ambition. RTOs, such as the German Fraunhofer-Gesellschaft or the Finnish VTT, aim to fill the gap that can exist between fundamental research and applied research and innovation. RTOs can play an intermediary role and help to promote and mainstream RRI/RI (e.g. Arnaldi and Neresini 2019). Our interest is also driven by our professional roles; the authors work at TNO, an RTO in The Netherlands, and were involved in a three-year project that aimed to further develop and institutionalize RI practices and processes in this organization (see below).

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In addition, we are interested in Societal Engagement (SE), one of the five thematic elements of RI.¹ SE typically refers to the involvement of diverse societal actors in the innovation process; one can think of large and small companies, government bodies and agencies, universities and research institutes, and Civil Society Organizations (CSOs).² The involvement of societal actors in research and innovation processes enables the organizations involved to organize a ‘transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products’ (von Schomberg 2013). SE promotes openness and collaboration and aims to organize and innovation *both with and for* society (Carrier and Gartzlaff 2019). In a similar vein, Fisher et al. (2015) discussed SE in terms of *socio-technical integration* and various collaborative approaches ‘that seek to broaden the societal contexts technical experts take into account during their routine activities’.

SE is similar to *societal alignment*, an approach put forward by Ribeiro et al. (2018) as an alternative to the *social control* approach to the Collingridge dilemma. This dilemma refers to the challenge of at the same time anticipating and controlling the impact of technologies: on the one hand, it is hard to anticipate a technology’s potential impacts while it is still in development; on the other hand, after a technology is developed, it is hard to control its further development and deployment. Ribeiro et al. (2018) propose that *societal alignment* would shift attention *away* from institutions that produce and regulate science, technology and innovation, and centralized, formal and regulatory roles; *towards* actors in the private and public sectors, and decentralized, informal and deliberative roles.

Stirling (2008) distinguished three types of motivations for SE (or ‘social appraisal’, the term he used): *normative* – organizing dialogues are good for reasons of democracy, equality or justice; *instrumental* – building trust, a positive reputation and support; and *substantive* – moving towards desirable goals, such as environmental quality, public health and human well-being. Moreover, SE would be especially relevant for RTOs, which have ‘public missions to support society’, according to the *European Association of Research and Technology Organisations*.³

A recent meta-analysis of the ‘role of stakeholders in the context of responsible innovation’ suggested that SE is relatively underdeveloped and under-utilized (Silva et al. 2019). We see a growing need for RI in general and SE in particular, e.g. with regards to emerging technologies (e.g. nano-tech, bio-tech, info-tech and cogno-tech) (Brey 2017). Other examples can be found in the domain of Artificial Intelligence (AI) (Floridi et al. 2018). There are currently many lists of ethical principles for the development and deployment of AI (e.g. High-Level Expert Group on Artificial Intelligence 2019).⁴ Most of these include recommendations to involve stakeholders and to take into account values, but none of them can be so specific as to recommend which stakeholders exactly to involve (and which not) and which values to prioritize (and which not). Moreover, we expect that organizations, both public and private, will be increasingly required to engage in RI and to organize SE, e.g. in the context of the European Commission’s *Horizon Europe* research programme, which will be ‘mission oriented’, that is, focused on solving societal problems and on engaging societal stakeholders (Mazzucato 2018).

In short, there seems to be a need to better understand SE in the context of RI. This is reflected in several contributions to the ‘*International Handbook on Responsible Innovation*’ which discuss SE in terms of participation and partnership (Blok 2019), the

broader innovation system (Forsberg 2019), democratic engagement (Hennen and Nierling 2019) or collective experimentation (Nordmann 2019).

SE shares similarities with *Quadruple Helix Collaboration* (QHC) (Carayannis and Campbell 2009), which refers to collaboration between and among academia, industry, government and societal actors, and which added *societal actors* to the *Triple Helix* model of collaboration between academia, industry and government (Etzkowitz and Leydesdorff 1995), in order to promote societal responsibility and to bridge the gap between innovation and civil society. SE also shares similarities with *Open Innovation* (OI) (Chesbrough, Vanhaverbeke, and West 2006), an approach to innovation in which organizations collaborate with, e.g. suppliers or clients during the innovation process. This is reflected in the title of a report on RRI/RI by the European Commission: '*Open Innovation, Open Science, Open to the World: A Vision for Europe*' (European Commission 2016). Finally, SE shares similarities also with the formation and management of *Innovation Eco-systems*, which refers to 'value creating interactions and relationships between sets of interconnected organizations' (Autio and Thomas 2014, 204). What these different approaches share, is a view that innovation does not happen – or indeed, *need* not happen – in splendid isolation.

We can map the ambitions of SE on the principles of RI that were put forward by Stilgoe, Owen, and Macnaghten (2013):

- Anticipation: an organization aims to interact with other actors and stakeholders in order to better explore future options and anticipate their effects;
- Reflexivity: an organizations aims to support its people in increasing their reflexive capacities and in redefining or enlarging their role responsibilities;
- Inclusion: an organization aims to involve and collaborate with diverse, actors and stakeholders in society during the research and innovation process;
- Responsiveness: these ambitions require that the organization and people involved are willing to change with regards to culture and leadership.

In sum, we can visualize SE as an organization's open and collaborative orientation to the rest of society, of which it is part, to align *its* concerns with concerns *of others* in society – see Figure 1.

Research context and questions

The research questions we will engage with can be understood best by starting with a description of the authors' context. We are both practitioners of RI and researchers of RI, and in that respect we position ourselves in the tradition of philosophical pragmatism (Dewey 1965) and reflective practice (Schön 1983). We moved back and forth between *practice* (carrying out RI projects and promoting RI) and *reflection* (engaging with and contributing to scholarly research) in order to develop practical knowledge: knowledge that is based on practices and that is practically applicable (Dewey 1965, 5–9). (For a description of our involvement in the phenomenon that we study, see below: Case Study.)

The authors work at TNO, a RTO in The Netherlands that was founded by law in 1932 with the goal to support the government and industries with applied research and innovation. TNO sits in-between academia (research) and industry (application), and its mission is to 'connect people and knowledge to create innovations that boost the

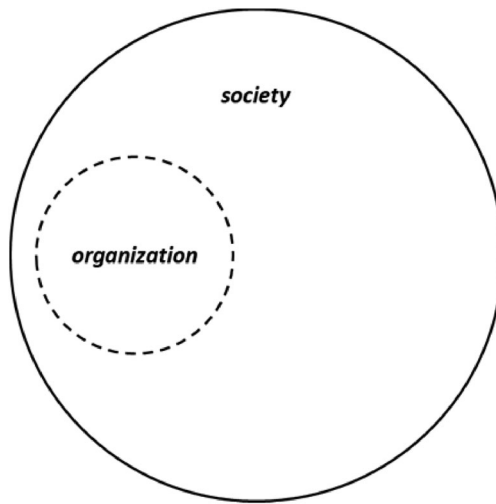


Figure 1. The organization aims to align its strategy with concerns in society.

sustainable competitive strength of industry and well-being of society'. SE is at the core of TNO's (formal) mission and (informal) culture. TNO has over 3200 employees, who work in diverse areas, ranging from sustainable energy and mobility to healthy living and social innovation, and from the digital society to security. TNO receives funding from three sources: the Dutch government, e.g. in consultancy projects; national and international funding, e.g. in joint research projects of the European Commission; and the industry, e.g. in contract research and development projects.

Moreover, the authors were involved in the JERRI project (2016–2019), which aimed to promote RI in RTOs.⁵ The authors did design, plan and implement several initiatives within TNO, in order to help further develop and institutionalize RI in the organization. The authors' roles in TNO and in this project gave them a unique opportunity to study the SE in practice, in the context of an RTO that wants to promote and improve RI, from-within and over-time (see below for our case study).

Taking into account the above (the gap in RRI/RI between academia on the one hand, and in industry, government and society on the other hand; the key role of SE in RI; and questions about the role that RTOs might play in filling this gap and in promoting SE), our research questions are the following:

1. *What are the potential advantages and disadvantages of Societal Engagement?* We address this question by discussing several insights from Technology Assessment and Stakeholder Theory, and by reviewing several relevant domains of practice in design and innovation.
2. *What advantages and disadvantages do people involved in organizing Societal Engagement activities perceive in practice?* We address this question via a case study of one SE initiative: the involvement of civil society organizations (COs) in Strategy Advisory Councils (SACs).

These questions emerged in part from the authors' first-hand experiences with SE: although SE sounds nice in theory and nobody would be *against* it, the organizing SE

in practice can be *problematic*, e.g. in terms of (formal) governance and processes (which are largely absent), and of (informal) culture and attitudes, which are often dominated by, for example, business concerns. The involvement of actors who are currently not involved in research and innovation will disrupt existing processes and practices. In short, we would expect a gap between the (theoretical) *potential* benefits of SE, which nobody is against, and the (practical) *perceived* benefits of SE, which often do not fully materialize. We are keen to better understand the practicalities of organizing SE in the context of an RTO that wants to promote RI.

Our paper will proceed as follows: first we review relevant literature and discuss the (theoretical) *potential* pros and cons of SE; then we present a case study of SE and discuss the (practical) *perceived* pros and cons of SE; and finally, we discuss our findings in relation to recent literature, notably work by Blok (2014, 2019), to understand SE in terms of dialogue and participation. We expect that our findings are interesting to people who work in RTOs or other organizations that aim to organize SE as part of their RI ambitions.

Technology assessment and stakeholder theory

We start our exploration of the potential advantages and disadvantages of SE with brief discussions of insights from Technology Assessment, Stakeholder Theory and several approaches in innovation and design: participatory design, human-centred design, the lead user approach, social innovation.

Technology Assessment (TA) (Schot and Rip 1997) is seen as an ancestor of RI (Grunwald 2014). It refers to the assessment of possible (negative) impacts of new or emerging technologies on society and the articulation of recommendations, typically with the aim to equip policy makers to deal appropriately with such technologies. For our current study, two variations of TA are especially relevant: *Participatory* TA (Joss and Bellucci 2002, see also Grunwald and Achternbosch 2013), which advocates involving societal actors, e.g. civil society organizations and citizens; and *Constructive* TA (Rip, Misa, and Schot 1995; Rip and Robinson 2013), which advocates not only *assessing* the application of technologies, but also *influencing* innovation practices, e.g. by making suggestions to modify these technologies. It has been proposed to combine various methods and approaches – Constructive TA, Value Sensitive Design (Friedman, Kahn, and Borning 2013) (see below), Socio-Technical Integration Research (STIR), Network Approach for Moral Evaluation (NAME) and Political Technology Assessment – under one header, *Comprehensive Technology Engagement*, which would focus on a ‘range of questions on the practice and theory of engagement as a whole’ and would aim to ‘encourage democratic reflection and dialogue’ (Doorn et al. 2013, 241–242).

Another relevant field for our discussion of SE is *Stakeholder Theory* (Freeman 1984). Freeman and McVea (2006) defined stakeholders, rather broadly, as ‘any group or individual who is affected by or can affect the achievement of an organization’s objectives’. Their definition draws attention to the *reciprocal* relationships between an organization and the various stakeholders around it; this view can empower stakeholders since they are not only viewed as *being affected* by the organization but also *being able* to affect the organization. They advocate organizing a ‘stakeholder approach to strategic management’, with the task ‘to manage and integrate the relationships and interests of shareholders, employees,

customers, suppliers, communities and other groups in a way that ensures the long-term success of the firm'. Involving stakeholders is not – or does not need to be viewed as – marginal, but can be of strategic importance for the organizations involved.

Domains of practice in innovation and design

In addition, we understand SE as an ongoing *process*, rather than as an end-goal. We are interested in practical efforts to organize interactions with diverse actors and stakeholders. If we focus on SE in such a *practical sense* – SE as organizing *meaningful* meetings with societal stakeholders – then there are at least three types of tasks, with associated questions and issues:

- 1) To select and invite actors and stakeholders to engage and collaborate with; this involves questions regarding which organizations or people to include or (unintentionally) exclude;
- 2) To organize meetings and dialogues, including the facilitating of effective communication and collaboration, and, e.g. to solve tensions that may arise between and among parties involved;
- 3) To take into account different parties' concerns, which can be challenging if these diverge, and to formulate conclusions and actions, and communicate these appropriately.

None of these steps is entirely unproblematic. For example, it can be difficult to identify up-front which stakeholders are relevant (and which are not), which stakeholders to include (or exclude), to facilitate communication and collaboration in ways that do justice to their diverse concerns, or to balance or combine conflicting concerns into a coherent strategy. Rather unsurprisingly, many organizations therefore do *not* involve societal stakeholders in their innovation process (Silva et al. 2019). However, an absence of SE can lead to situations in which actors '[are] unaware of the importance of societal context, or where stakeholder interactions [are] unproductive in the resolutions of conflicts', and even to 'irresponsible innovation' in the form of 'Technology push, Neglectance of fundamental ethical principles, Policy Pull, and Lack of precautionary measures and technology foresight' (von Schomberg 2013). Obviously, this can be detrimental, both for the organizations involved and for society at large.

In addition to Technology Assessment and Stakeholder Theory, there are several domains of practice in design and innovation that can help to better understand SE:

- *Participatory Design* (PD), 'an approach towards computer systems design in which the people destined to use the system play a critical role in designing it', with its origins in Scandinavia and an orientation towards empowerment (Schuler and Namioka 1993, xi) (see also Nordmann 2019). The potential advantages of PD are threefold, according to Greenbaum (1993): *pragmatic* – it helps to get 'the job done better'; *theoretical* – it is needed for effective communication and cooperation; and *political* – 'people have the right to influence'. Regarding potential drawbacks, it has been noted (Spinuzzi 2005) that doing PD properly does require time, resources and commitment, and it is associated with *incremental* innovation, rather than with *radical* innovation ('evolution, not revolution') because it takes the current situation as a starting point.

- *Human-Centred Design* (HCD), which refers to diverse approaches that aim to put people, and their contexts, aspirations and experiences, central during the design and development of products and services, and which advocates organizing an iterative process and multidisciplinary teamwork (Sanders and Stappers 2008; ISO 2010; Steen 2011). The potential advantages of HCD can be summed up as follows: better knowledge on users and focus on users' experiences; better and more diverse ideas and increased creativity; better decision making and shorter lead-times, in the organization or in the project, because of increased clarity on users' behaviours, needs and preferences (Steen, Manschot, and de Koning 2011). The potential drawbacks are related to more complexity in the design or innovation process, and having less control over this process (Steen, Manschot, and de Koning 2011).
- *Value Sensitive Design* (VSD), which refers to a methodology to better understand and take into account different stakeholders' values and interests during a design process. VSD typically consists of three types of investigations: *conceptual* – to identify relevant stakeholders and relevant values and interests for a specific project; *empirical* – to study relevant stakeholders' values and interests, e.g. via interviews or interactive workshops; and *technical* – to explore, develop and evaluate various proposals, designs or solutions, in ways that attempt to take into account different (and sometimes conflicting) values (Friedman and Kahn 2003; Friedman, Kahn, and Borning 2006, 2013). These types of investigations are ideally conducted in a participative, iterative and creative manner – loosely based on traditions like PD and HCD.
- Collaborating with *Lead Users*: this term refers to people who 'are at the leading edge of an important market trend(s), and so are currently experiencing needs that will later be experienced by many' (Von Hippel 2005, 22), and who create innovations, not only for themselves but also for others. The potential advantages of a *Lead User* approach are similar to HCD (better knowledge on users and their experiences, better and more diverse ideas, better decision making, and shorter lead-times). In addition, the following potential drawbacks can be identified: it can be difficult for developers to adopt ideas from users ('not invented here'); the (perceived) risk of losing Intellectual Property (IP) when collaborating with users; and the challenge of balancing costs and benefits for lead users ('what's in it for them') (Lüthje and Herstatt 2004).
- *Social Innovation* (Hubert 2011; Murray, Caulier-Grice, and Mulgan 2010), which takes societal needs as a starting point for innovation and promotes public-private partnerships and social entrepreneurship to develop and deploy social innovations. It has the following potential benefits: it can help to create 'compelling new social relationships'; to create synergy between organizations, sectors, disciplines; and to combine existing elements, e.g. products, services or processes (Mulgan et al. 2007, 33–35). Conversely, it has the following potential disadvantages: it can be hard to cross 'organisational, sectorial or disciplinary boundaries'; to effectively 'scale-up' innovations; and to manage the expectations of citizens, partners and politicians involved (Mulgan et al. 2007, 33–35).

Potential advantages and disadvantages of stakeholder engagement

Drawing from the fields discussed above, we can identify the following *potential* advantages and disadvantages of organizing Societal Engagement:

Advantages:

- Outside-in orientation: Better understanding of concerns and interests in society, e.g. a better understanding of the problems that people encounter, and (thus) better able to generate solutions;
- Legitimacy: Legitimacy of the organization, e.g. to secure its 'societal license to operate', to provide insights to citizens about how innovation 'works' and to give them a voice in it;
- Alignment: Better alignment of the organization's strategy to concerns and interests in society, e.g. better alignment to citizens' needs – and indeed different needs of different groups;
- Collaboration: Build relationships and collaborations, co-create agendas for future actions, e.g. collaborate with pioneers, who can become advocates for the project;
- Clarity: Clarity within the project or the organization, and hence better or faster decision making, e.g. clarity about the problem, and (thus) clarity about the direction for searching solutions.

Disadvantages:

- Effort: It requires time. Budget and resources, and expertise, skills, attitudes, and commitment to do this well – of organizations and people involved (in all: PD, HCD, Lead user, Social Innovation)
- Complexity: More complexity ('too many viewpoints'), and (hence) less control; e.g. it can be hard manage IP – see also: risk for damage to reputation, below;
- Slowdown: Risks of stifling innovation (e.g. 'evolution, not revolution'), of being unable to adopt ideas of others ('not invented here') or of being unable to 'scale-up' innovations;
- Expectations: Hard to manage expectations of parties and people involved; also the risk of not giving citizens autonomy, e.g. 'taming' or neglecting their input;
- Reputation: Difficult to control risks, e.g. for reputation, when an interlocutor 'spills beans', talks about sensitive issues to a journalist who's looking for a scoop.

Case study: approach and methodology

Besides the theoretical or potential pros and cons of SE from literature (above), we are interested in the pros and cons that people perceive in practice. In order to further our understanding of the latter, we conducted a case study. As was mentioned above, the authors work in an RTO and were involved in a project that aimed to further improve and institutionalize RI in their organization. We were involved in several initiatives in this project⁶, of which we will focus here on one, which directly pertains to SE: the involvement of civil society organizations (CSOs) in the organization's Strategy Advisory Councils (SACs). These SACs are required by law – the law via which the RTO was founded; one SAC is required for each of the organization's departments or units.⁷ The Managing Director (MD) of each Unit is responsible for creating a SAC for their Unit and for organizing two to four meetings per year with the people of the SAC of their Unit.

Because the authors were actively involved in the object that they studied (one SE initiative within this project they work in, within the organization they work in), our

case study can best be understood as a form of *action research* (McPhee, Hoppe, and Lindhult 2019). In action research the researchers have both outsider roles and insider roles, and they seek both to engage in reflexivity as researchers and generate outcomes that are relevant for academia, and to make progress as practitioners and generate outcomes that are relevant for their project (Ollila and Yström 2020). In short, in *action research* one aims to productively combine academic concerns and practical concerns (Guertler, Kriz, and Sick 2020).

Furthermore, action research introduces the topic of *reflexivity* (Weick 2002; Orr and Bennett 2009; Rhodes 2009; Hibbert, Coupland, and MacIntosh 2010); the authors studied practices in which they were themselves involved. We chose to deal with this reflexivity in a productive manner: we spoke frankly about our aims, roles, concerns and interests with the people involved in our activity, and we discussed our observations, findings and preliminary conclusions with researchers outside our organization.⁸ This contributed to *research integrity* and clarity during our activities (action-orientated), and to *research reliability* (reflection-orientated).

In the vocabulary of case study research (Yin 1994), ours has been a ‘single case study’, an approach that can be justified because it can function as a ‘revelatory case’, a study of a situation where the researcher has ‘an opportunity to observe and interpret a phenomenon previously inaccessible to scientific investigation’ (Yin 1994, 38–40). Our study can be thought of as a revelatory case, because it rarely happens that researchers have access to the practicalities and details of SE initiatives within an RTO, from-within (as practitioners) and over the course of three years (the project’s lead time).

Practically, our case study involved the analysis of documents, e.g. action plans (many of which were written by the authors⁹), observation of meetings and interviews (many of which were organized by the authors). We made notes throughout the process and organized *investigator triangulation* to preserve research objectivity, in collaboration with project partners.

Societal engagement in a research and technology organization

The starting point for the authors’ activity (early 2017) was the observation that these SACs (as per 2015), were dominated by industry, government and academia. We categorized the 58 members of SACs according to affiliation and gender¹⁰: 29 were from Industry, 17 from Government, 8 from Academia, and 4 from Civil society organizations; and 51 were male and 7 female; see Figure 2.

Based on this situation, our aim was to make these SACs more representative of the various concerns and interests of actors and stakeholders that exist in society: *more inclusive* of, e.g. civic organizations (and less skewed towards industry) and *more diverse*, e.g. in terms of gender and age (less skewed towards men) – in short: more representative of society. This aim can also be understood in terms of moving the locus of RI from output to input (Brand and Blok 2019); in this case, the ambition is to improve RI in the organization by making the SACs – who will advise the organization – more inclusive and diverse. Regarding this aim, several elements were in place: the organization’s ambition to engage with society; a legal requirement to have SACs; data about the SACs current compositions; and our ambition to make the SACs more inclusive and diverse. Two more things were needed to initiate organizational change: a point in *time*, and a point of *leverage*.

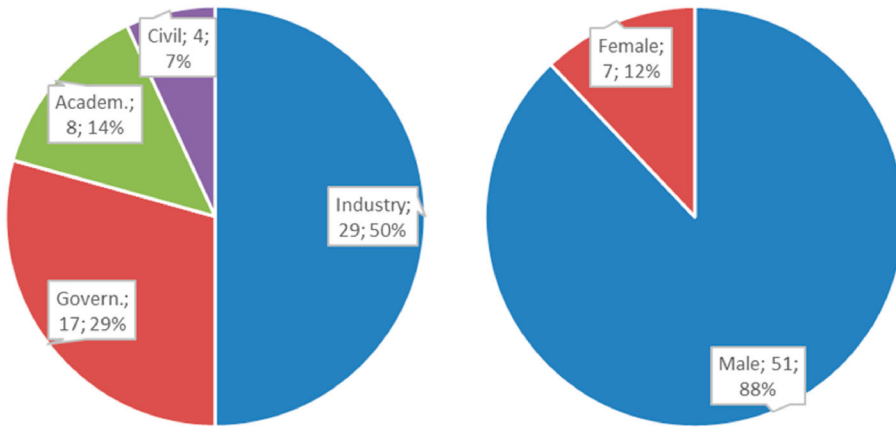


Figure 2. Strategy Advisory Councils members (2015–2017; total 58): affiliations and genders.

A point in *time* was found in the restructuring of the organization: as per January 2018 it was planned to move *from a matrix-based structure*, with 5 Units (for different application domains; and a series of Expertise Groups perpendicular to these Units, working for various Units; and a SAC for each Unit), *to a unit-based structure*, with 9 Units (and a number of dedicated expertise groups within each Unit; and a SAC for each Unit).¹¹ As a consequence, the five SACs would need to change into nine (partly new) SACs. All SACs would need to be re-configured; current members would need to be reappointed and new members would need to be found, invited and appointed. We saw this restructuring as a window of opportunity: with the organization and its Units in flux, we would be able to suggest and implement changes in the new Units' SACs. Additionally, a point of *leverage* was found in collaborating with people of TNO's Corporate Strategy department. We helped them to write *Terms of Reference*, which has the following guidelines to make the SACs more inclusive and diverse (translated from Dutch):

- A good balance between business, academia, government and societal organizations;
- Especially societal organizations are currently underrepresented. Based on TNO's mission and ambitions for societal engagement, e.g. alignment to the United Nations' Sustainable Development Goals, there is an emphatic appeal to explore possible inclusion of these types of organizations;
- A good balance of men/women, in line with the ratio in the domain of each Strategy Advisory Council;
- Attempt to represent different age groups.

These *Terms of Reference* were adopted by the Executive Board (in November 2017) and subsequently handed over to the MDs of the Units. The process of introducing these *Terms of Reference* entailed a series of meetings: with the *strategy managers* (people at Corporate Strategy who support people in the Units to implement policies from the Executive Board), to raise awareness of the need to make the SACs more inclusive and diverse; and with the (new) Units' MDs, to discuss potential advantages and disadvantages and ideas (of the authors) for inviting specific civil society organizations (CSOs)¹², and, more broadly, to share positive and negative experiences of involving CSOs.

Additionally, we conducted a series of interviews with eight (out of nine) MDs (October 2018-January 2019; each interview one hour; notes made by the interviewer and reviewed, amended and approved by the interviewee). In these interviews, we reflected on the process of creating the SACs, with a focus on their perceptions of advantages and disadvantages of involving CSOs. After these interviews, we knew the compositions of the new SACs; their members' affiliations and genders are presented in Figure 3. On a content-level, the authors' intervention was successful: engagement of CSOs went up from 4 (7%) to 10 (13%) and participation of female members went up from 7 (12%) to 18 (23%).¹³

Interestingly, one of the authors initially believed (somewhat stereotypically) that SAC members from the industry (for-profit companies) would only focus on concerns for *profit* – possibly 'framed' in terms of economic growth, competitive strength, and securing employment – at the expense of concerns for *people* and *planet*, and that people from CSOs would be needed to bring concerns for *people* and *planet* to the table. However, in the interviews it became clear that the MDs had selected people from the industry that are willing and able to express societal concerns and advocate responsible innovation, e.g. in terms of the need to move towards sustainable energy. One MD called them 'rebels': people who dare to dissent and to pioneer RI.¹⁴ In other words (and, with the advantage of hindsight, rather unsurprisingly), one does not necessarily need to work for an NGO to have concerns for people and planet; people working in for-profit companies can also have those. In addition, several of the MDs expected that people in companies will more easily move towards RI by listening to people who also work in companies; 'people who know how the industry works'. More easily than, e.g. listening to people from an NGO, because that brings the risk of polarization instead of dialogue.

Perceived advantages and disadvantages of stakeholder engagement

Below we summarize the MDs' responses about advantages and disadvantages of having Civil Society Organizations (CSOs) in their Strategy Advisory Councils (SACs), following the categories found in our discussion of the literature (above):

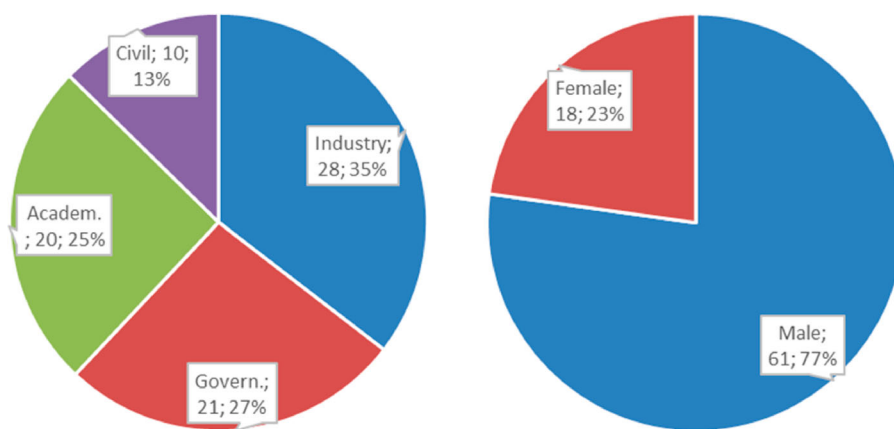


Figure 3. Strategy Advisory Councils members (as per 2018; total 79): affiliations and genders.

Advantage: outside-in orientation

Many MDs did perceive the advantage of improving an outside-in orientation through the involvement of societal stakeholders. They talked about ambitions to have a more 'balanced representation of industry, government, academia and societal organizations'. Also, some MDs referred to the need to collaborate with 'new leaders, for a new world'; in line with TNO's ambition to contribute to, e.g. transformations towards more sustainable traffic and transport. In addition, some talked about the need to have stakeholders from different 'political colours', in order to have balanced view on, e.g. the circular economy – a topic that may be viewed differently by people and organizations at different locations on the political spectrum.

Advantage: legitimacy

Similarly, many MDs talked about the need for more inclusive and diverse SACs in order to promote TNO's legitimacy. They talked about how people in a SAC can 'hold up a mirror', to 'keep [us] sharp'. Additionally, we found that the *Terms of Reference* helped the MDs to make inclusion and diversity a 'need to have' topic, rather than a 'nice to have'. Some MDs interpreted legitimacy also on the *content* level; they talked about the need to have people with different fields of expertise in the SACs (e.g. for *Industry; Traffic and Transport*, and *Buildings, Infrastructure & Maritime*). A SAC feels more legitimate when it represents the relevant fields of expertise. Additionally, some MDs associated legitimacy with alignment and collaboration. For example, more inclusive and diverse SACs will help TNO to align its strategy to concerns in society and, to a certain degree, to re-define its role in society and re-invent itself.

Advantage: alignment

Many MDs talked spontaneously about alignment. Interestingly, they not only talked about alignment between TNO and society at large, but also about alignment between different members within a SAC. They argued that some level of harmony between and among SAC members is needed, e.g. to get a conversation started, to be curious regarding other members' perspectives. Additionally, they argued that some level of dissent is also needed, e.g. a 'lateral thinker' or 'rebel' as chairperson, a member with 'out of the box' ideas, or having people with contrasting viewpoints. Combining harmony and dissent requires a careful selection of people, e.g. regarding their personalities and dispositions. Most SACs tried to create a balance between viewpoints, e.g. by bringing together relatively conservative actors and relatively progressive actors, regarding their viewpoints on sustainability in the industry.

Advantage: collaboration

The MDs talked about mobilizing people's shared motivations to 'do good' and about joining forces and creating a 'coalition of the willing'. They spoke about how involving civil society organizations in the SACs can help to create a shared vision and shared goals with regards to societal challenges: e.g. in the Industry domain, a shared vision

and goals with regard to carbon-reduction (to combat climate change), automation (while upholding workers' dignity), and transitioning towards *smart cities* (which combine triple bottom line goals; people, planet, prosperity). We also found that the MDs see collaboration as a multi-way street: SAC members not only provide input to TNO (their primary role as a SAC), but SAC members can also help TNO access their networks in the different domains (they can help to 'open doors'), and, conversely, SAC members can access expertise in TNO. The SACs can ignite and reinvigorate collaboration towards a shared vision and shared goals.

Advantage: clarity

Potentially, more inclusive and diverse SACs can promote clarity about challenges at hand (problem-setting) or about potential strategies (solution-finding) (Steen 2013). However, during the interviews, only one or two MDs referred to it; they talked about how engaging with civil society organizations can help TNO to clarify its strategy and to re-invent itself. One MD talked about how conversations with people in their SAC helped to clarify their Unit's dual strategy: one part of their Unit works for the industry e.g. developing technologies, whereas another part works for the government, e.g. helping to develop policies. Similarly, talking to SAC members helped to clarify the role of TNO, e.g. 'to interpret trends and facts, provide sense-making, and express a vision', and what it would mean to be a 'thought leader'. This advantage of creating clarity is possibly under-utilized within TNO.

Disadvantage: effort

Many MDs found it hard to make the organization of their Unit's SAC a top priority. They 'already have enough tasks on [their] plate', as one put it. Possibly this is because MDs have multiple tasks, ranging from clients and business development to knowledge development and application to human resources and operations. This is especially the case in the couple of months before the restructuring, as per January 2018; they need to organize many and diverse issues for their Unit. Some MDs also mention that finding potential members, especially from civil society organizations, can require efforts because relevant contacts, e.g. via members of the Executive Board, are relatively few in domains that are relatively new to TNO. In other words, they need to build relevant, personal contacts before they can invite them as potential members. This requires effort and time.

Disadvantage: complexity

Another perceived disadvantage of involving civil society organizations in the SACs is that it increases complexity. It can be challenging enough to facilitate communication between and among people from industry, government and academia, e.g. because of different character traits or attitudes, 'big egos'. The inclusion of civil society organizations could add to that complexity and increase potential tensions between diverse interests. For example, the interests of *Bits of Freedom* regarding protecting citizens' privacy in collecting personal data by the industry or by the government – which may come into tension with interests of the industry or of the government. The chairperson of a SAC will, of course,

attempt to make these tensions productive. Still, this task is perceived as complex by the MDs. The JERRI project team members anticipated this challenge and suggested not inviting organizations that are activist, e.g. a one-issue pressure group or a group with a very explicit political orientation, but inviting organizations that are able and willing to engage in constructive dialogues.

Disadvantage: slowdown

Most MDs talked about the slowness of the process of creating the new SACs. There is a formal process of first installing a chairperson for each SAC and then, together with that chairperson, selecting and inviting the SAC's potential members. Installing a chairperson involves creating a list of potential chairpersons, with a proposal for one of them, and asking the Executive Board to approve the proposed chairperson, and then contacting that person. Obviously, this process would need to be repeated if the proposed chairperson is unavailable. The same can happen with members; they can be unavailable for the role of member. This can be a 'delicate process' with a 'long lead time' indeed. The slowness is, by the way, only partly due to the inclusion of civil society organizations; the process would be the same with or without civil society organizations.

Disadvantage: expectations

Some MDs talked about the difficulty of managing expectations, e.g. regarding independence. Many MDs choose not to have major clients in their Unit's SACs because that may give an impression of favouritism, like they would have privileges over other members. Therefore, large companies or Dutch Ministries are rarely invited to join a SAC. Something similar is the case for the inclusion of civil society organizations. Making them join a SAC may give them the impression that TNO will follow their advice. TNO cannot do that, of course – instead, TNO will listen to all SAC members. Such expectations, however, will need to be managed carefully, especially for civil society organizations. TNO asks them to join because of their societal ambitions and goals – but, at the same time, TNO cannot promise to completely align its strategy to their ambitions and goals.

Disadvantage: reputation

Finally, there's the perceived risk of damage to the organization's reputation. Interestingly, this occurs in two directions. On the one hand, TNO is hesitant to invite civil society organizations, especially those that lean towards activism because their involvement can cause a risk to TNO's reputation as independent (Freeman and McVea 2006). On the other hand, a civil society organization can be hesitant to become involved in one of TNO's SACs because they want to remain independent and committed to their causes and goals. One MD did explicitly weigh the pros and cons of inviting a somewhat activist civil society organization in terms of the risk that this organization would sit in a couple of times and then leave 'with a big drum roll' and 'score a point', for example, in a popular news medium, in order to further their own agenda (and decided *not* to invite them; they already meet regularly in other venues, which offers them opportunities to discuss sensitive issues informally).

Discussion

In our review of the literature, we found the following *potential* advantages of SE: outside-in orientation, legitimacy, alignment, collaboration, and clarity; and the following disadvantages of SE: effort, complexity, slowdown, expectations, and reputation. These advantages can be understood more practically through our case study. In our case study, we found that the advantages of *outside-in orientation*, *promoting legitimacy* and *strategy alignment* are well-recognized – indeed, most people at TNO would say that this is indeed the purpose of the SACs. Conversely, the advantages of *collaboration* and *clarity* are less often mentioned or less immediately obvious. In addition, the disadvantages of *effort*, *complexity* and *slowdown* seem to play more general in the organizing of SE, whereas *managing expectations* and *reputation* seem to relate more specifically to the involvement of civil society organizations, especially if they are perceived as ‘activist’.

Listening to the MDs, we can draw Figure 4, to visualize the organization’s interactions with a number of specific organizations; the three arrows illustrate the following interactions: listening to, mutual exchange, and exercising influence (from top to bottom).

Based on our case study, we propose that the potential for *collaboration* and *clarity* can be (better) realized if SE is taken one step further. If an organization not only embraces an *outside-in orientation*, *legitimacy* and *alignment*, but also *collaboration* and *clarity*, the picture changes – see Figure 5. An organization can then *collaborate* with (civil society) organizations and develop *shared visions* and *clear goals*, which they can *collaboratively work towards*. The locus of innovation is then *in society* and leadership roles are dynamic. This picture is in line with the state of the art in (distributed, relational, transformative) leadership. Drath et al. (2008), e.g. write about *direction, alignment, and commitment*: leadership then emerges through collaborative goal-setting, aligning strategies, and commitment to collaboration towards these goals.

Likewise, we propose that the advantages of collaboration and clarity are often underutilized, compared to more obvious advantages of an outside-in orientation, legitimacy

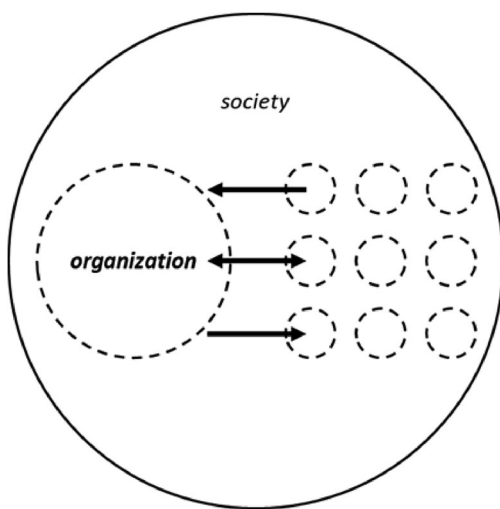


Figure 4. The organization interacts with organizations, in mutual exchanges.

and alignment. Looking at our case study, the inclusion of CSOs in the SACs can indeed help to further develop the role of the SACs beyond an advisory role – in line with TNO’s mission in society and its organizational culture. Moreover, making the SACs more inclusive and diverse required only a small push: the creation and implementation of *Terms of Reference* at the right moment, during the organization’s restructuring.

Finally, we would like to draw attention to the *quality* of the interactions between and among the organizations involved in SE. It is not sufficient to just interact. Attention and effort will need to go into these interactions to make them meaningful and effective. Related to this, Sykes and Macnaghten (2013) provided a list of conditions that will hamper effective interactions (‘Ways of doing it badly’). We can inverse these conditions to articulate recommendations for organizing SE effectively: when decisions have *not yet* been made; when the sponsoring body is *willing* to listen; when a *diverse* array of stakeholders or members of the public is involved; when the issue being debated was framed *with public or stakeholder input*; when the interactions are an integral part of the R&D process.

More specifically, we can discuss our findings in the light of Blok’s (2014, 2019) view on SE in terms of dialogue and participation. Drawing from the philosophy of Levinas, Blok views SE as an encounter between *other* and *self*. According to Levinas, the *self* is inclined to view the *other* through its own lens, to reduce the *other* to what the *self* already knows, and is then unable to learn anything new from the *other*; the relationship between other and self is always ethical and the other demands an ethical response of the self (Steen 2015). This view can help to integrate ethical *responsibility* – understood rather literally, using Levinas’ vocabulary, as *being able to respond to the appeal of the other* – with SE.

Blok (2019) argues that SE is often associated with consensus and harmony, which he finds paradoxical; instead he advocates making more room for differences, for controversy and for constructive conflict. He proposes to view ‘the other stakeholder ... as an absolutely different actor with fundamentally different value frames and interests, who can never be fully understood’. This would shift dialogue and participation away from

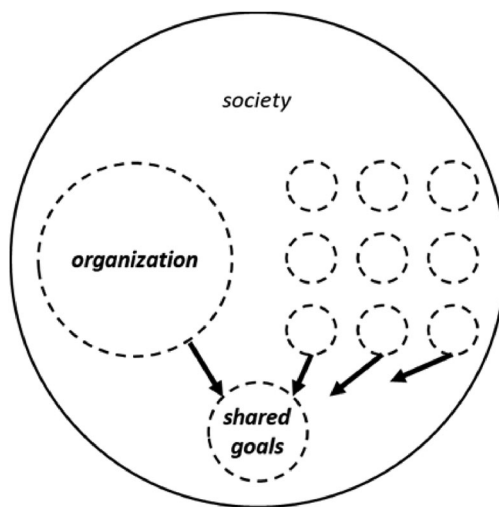


Figure 5. The organization collaborates with organizations towards shared goals.

cognitive approaches to understand each other and to collaborate with each other, towards a focus on the social-ethical relationships between the people involved.

If we apply this view on SE to imagine a future meeting of a Strategy Advisory Council (see above), we can envision a meeting in which the people around the table discuss not only *content*, e.g. strategies and policies, but also the social-ethical qualities of their *relationships*, e.g. the demands that one actor poses to another actor. This would be in line with a stakeholder approach (Freeman and McVea 2006) that understands relationships as reciprocal – rather than in terms of agent/patient, active/passive or dominant/subservient. Furthermore, the people around the table would do their best to behave responsibly and ethically in response to the other participants and their demands; they would not so much view their identity as starting points for the discussion, but be open to other participants and their inputs so that the discussion's output can shape and modify their identities; and rather than trying hard to prevent being criticized, they would apply healthy doses of self-criticism and be open to the people around the table.¹⁵ Such a view on SE would be in line with Ribeiro et al.'s (2018) proposal to involve diverse actors, to organize decentralized, informal and deliberative governance mechanisms, and to pay attention to politics, culture and ethics.

Conclusions

We are interested in Societal Engagement (SE) as a key element of Responsible Innovation (RI). More specifically, we want to better understand the advantages and disadvantage of SE. In addition, we want to better understand the role that Research and Technology Organizations (RTOs) might play by organizing SE to bridge the gap between fundamental research in academia and applied research, development and deployment in society.

In a literature review we found the following *potential* advantages of SE: *outside-in orientation*, *promoting legitimacy*, *strategy alignment*, *collaboration* and *clarity*; and the following potential disadvantages of SE: *effort*, *complexity*, *slowdown*, *managing expectations*, and *reputation risks*. In addition, we conducted a case study of one SE initiative: the creation of more inclusive and more diverse Strategy Advisory Councils in one RTO, in which the authors work, e.g. by inviting Civil Society Organizations. We found that the potential advantages of *collaboration* and *clarity* are relatively less well recognized and potentially under-utilized – and that these can help to create shared goals, such as sustainable innovation, and to collaborate towards these goals. The organizing of open and mutual exchanges can help like-minded people to join forces in RI. If these exchanges are indeed open and mutual, the potential disadvantages of managing expectations and reputation risk, which are associated with engaging with civil society organizations, can be mitigated.

Furthermore, we can articulate several tentative suggestions to promote SE, e.g. within an RTO, based on this case study. It seems like a good idea to find a *point in time* and *point of leverage* to intervene with initiatives to promote SE. In our case, the point in time was the organization's restructuring: lots of things were in flux. For example, the newly appointed managing directors were looking for clarity about their new roles. We perceived this restructuring as an opportunity for change. In our case, the point of leverage was the creation of *Terms of reference*, with practical recommendations for creating *Strategy Advisory Councils*. The managing directors were happy to follow these recommendations; it helped them to achieve results. The *Terms of reference* thus became a tool for change.

Finally, we propose that *ethical* responsibility can be integrated in SE by drawing attention to the social-ethical qualities of the relationships between and among the people involved (Blok 2014, 2019). Practically, this would entail making more room for other people, for differences between people and for responding to other people's demands, rather than taking one's own interests as a starting point.

Notes

1. The other elements are: Open Access or Open Science; Gender Equality and Diversity; Ethics; and Science Education or Citizen Science (<https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>). We use the term *Societal Engagement*, rather than *Public Engagement*, because the former is more encompassing; it includes various societal actors and stakeholders.
2. We use the term '*Civil Society Organization*' to refer to various (overlapping) types of organizations: non-governmental, third-sector, non-profit, volunteer, grassroots, self-help, etc. See also: (Ahrweiler et al. 2019).
3. <http://www.earto.eu/about-rtos/>
4. For an overview of diverse guidelines, see: <https://alanwinfield.blogspot.com/2019/04/an-updated-round-up-of-ethical.html>
5. See: <https://www.jerri-project.eu> for more information.
6. With a project team of five people, each with a focus on one element of RI: Societal Engagement, Ethics, Open Access/Open Science, Gender Equality and Diversity, and Science Education.
7. Translated from the Dutch 'TNO Law', chapter 3, section 4, article 15 (https://wetten.overheid.nl/BWBR0003906/2019-01-01/#Hoofdstuk3_Paragraaf4_Artikel15)
8. With partners in the JERRI project: researchers from Fraunhofer-Gesellschaft, Manchester Metropolitan University and the Institute for Advanced Studies.
9. See: <https://www.jerri-project.eu/jerri/results/deliverables/>
10. TNO Annual Report 2015, pp. 8–32 (https://www.tno.nl/media/7838/tno_annual_report_2015_web.pdf).
11. In 2015, there were five Units: *Industry*; *Healthy Living*; *Defence, Safety and Security*; *Urbanisation*; and *Energy* (https://www.tno.nl/media/4733/tno_strategic_plan_2015_2018.pdf). As per 2018 there were nine Units: *Industry*; *Healthy Living*; *Defence, Safety & Security*; *Buildings, Infrastructure & Maritime*; *Traffic & Transport*; *Circular Economy & Environment*; *Energy*; *Information & Communication Technology*; and *Strategic Analysis & Policy* (<https://www.tno.nl/en/focus-areas/>).
12. E.g., the Dutch NGO *Red Cross* could advise on humanitarian aid in the context of conflict and violence for the SAC of the Unit *Defence, Safety and Security*, or Dutch NGO *Bits of Freedom* could advise on privacy issues regarding the collection of citizens' personal data for the SAC of the Unit *ICT*.
13. TNO Annual Report 2018, p. 35 (https://www.tno.nl/media/14234/tno_annual_report_2018.pdf); see also: <https://www.tno.nl/en/about-tno/organisation/strategic-advisory-boards/>). The composition of the SAC of the Unit *Circular Economy & Environment* was not included because it was unavailable at the time of writing.
14. In Figure 3, e.g., 'rebels' in the industry are still counted as 'Industry', and not as 'Civil Society Organization'.
15. Based on three other shifts discussed by Blok (2019): from a focus on actors' *intentions* to respect other actors' demands, to a focus on actors' *performances* of ethical behaviour in response to other actors' demands; from a focus on actors' identities (mission, interests, core values) as *input* for collaboration, to a focus on actors' identities as *output* of their responsiveness to the demands of other actors; and from the prevention of criticism ('immunization strategy'), to enhancement of self-criticism by involving fundamentally different actor ('vulnerability strategy').

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