

HARNESSING AND REALIZING SOCIAL INNOVATION FOR RTOS – A SOCIAL FORESIGHT LAB APPROACH

Social and technological innovations are intertwined. This affects innovation processes. Following an understanding of social innovation as innovation's social dimension, this paper proposes a social foresight lab as a means for research and technology organizations (RTOs) to harness and realize the potential of social innovation.

Fabian Schroth / Martina Schraudner

INTRODUCTION

Traditional processes of research, development and innovation open up towards new stakeholders, as concepts like Quadruple Helix [1] highlight. This is due to an increase in interdependencies between social and technological innovation. Thus, innovation processes rely on the dynamic and flexible interaction of multi-actors and diverse elements, rather than on a number of synchronised, stable process steps. While research and technology organizations (RTOs) are central players for traditional innovation processes, they need to reorient themselves strategically in these changing innovation systems.

Over the last decade, the research community has started to connect the discourse on social innovation to the discourse on technological innovation. Following a sociological understanding, social innovations are defined as new practices meeting social needs in a new, more efficient or effective way than existing ones [2]. There is a strong interdependency between said social and technological innovations [3]. For technologies to become adopted and realize their full potential, social needs and behaviours are often more important than merely economic, political or technological aspects. Likewise, technological innovation is essential for giving people the tools to shape and transform societies as they dramatically increase their knowledge, capacities and reach. What is more, social development is critically important for technological innovation by providing for social acceptance thus ensuring that new technologies are actually being used. Consequently, we understand social innovation as one dimension of innovation, namely its social dimension. Doing so allows us to connect social and

technological innovation and make the concept of social innovation useful for RTOs as it reveals new aspects of innovation such as human-machine interaction, new labor requirements, ethics and legal regulations as well as the societal challenges addressed by an innovation. Yet, this approach differs from understandings of social innovation commonly used such as the aforementioned definition of Howaldt and Schwarz [1].

For technologies to become adopted and realize their full potential, social needs and behaviours are often more important than merely economic, political or technological aspects.

Taking this understanding of social innovation as a starting point, this paper asks how RTOs can take the social dimension of innovations into account, which consequences this bears with view to their R&D, and what benefits it provides to them.

NEW APPROACHES FOR ALIGNING SOCIAL AND TECHNOLOGICAL INNOVATION

A first step for RTOs to take the social dimension of innovation into account is to consider innovation systems as Quadruple Helix Systems. Describing innovation systems as a quadruple helix, acknowledges that innovations result from the interaction of actors from academic research,

business, government, and civil society. So far, RTOs are well-positioned within a triple helix, cultivating close connections to industry and government alike. There are established formats for interaction among the academic, business, and policy sector. These formats range from joint research projects to political hearings and expert advisory groups. Yet, such Triple Helix Models fail to integrate users or civil society actors as a fourth relevant sector. Their perspective and practice, however, is just as relevant for innovations to emerge and eventually succeed as that of other sectors. Thus, conceptualizing innovation systems as Quadruple Helix Systems enables RTOs to consider their missing link to civil society.

What is missing though is an established format or interaction process between RTOs and civil society actors. There is a strong need for an approach capable of taking the interconnectedness of an innovation's social and technological dimension into account, ultimately aiming to align the social and technological dimension along the innovation process. This approach faces two requirements: first, it needs to integrate the perspective of the missing fourth sector, civil society, into innovation activities; second, it needs to take emerging realities into account [4].

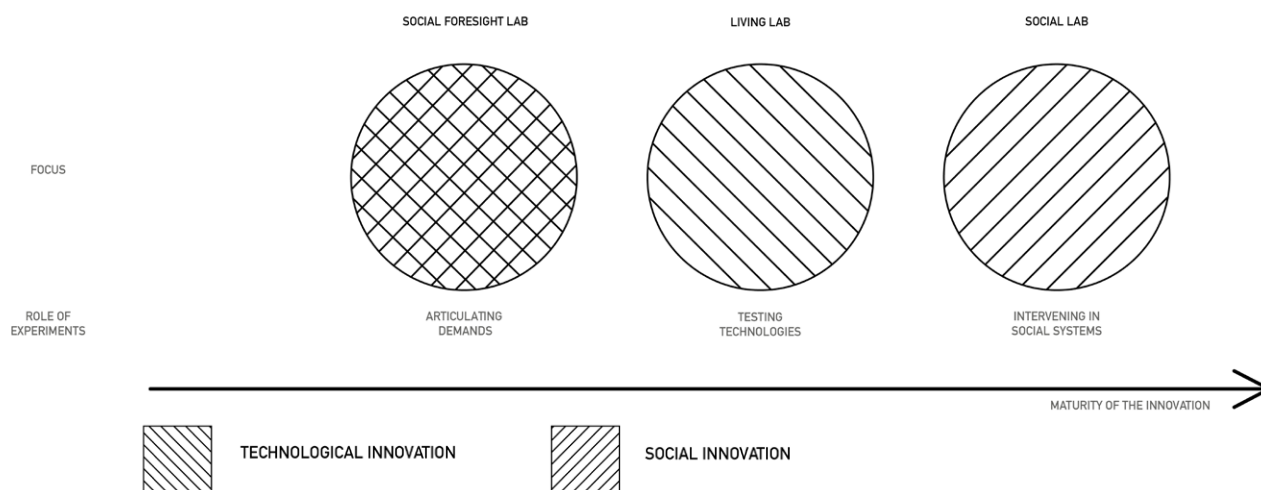
A prominent approach towards meeting these requirements are laboratories in real-world contexts (LRW). Different concepts of LRWs exist, called living lab, social lab, and real world laboratory to name but a few. What these approaches have in common is their commitment to involving multi-stakeholder in innovation processes by experimenting in a real-life setting, aiming to facilitate mutual learning among these different actors. There are, however, three central differences (see diagram) regarding the stage of the technological maturity at which the labs are employed; the role experiments play in the labs; and their focus on technological or social innovation.

Living labs focus on technology development. People are involved in R&D processes as users of a technology. Real-life experiments are deployed as a method for testing technologies in real life and taking people's daily interaction with said technology into account. Such a concept is technology-driven and understands social innovation as a response to technological innovation. Social labs, on the other hand, focus on societal change. Multiple stakeholders are involved in the process as those who may implement change. Real-life experiments are proposed as a method for intervening in social systems and taking the emerging realities of these systems into account [4]. This concept focuses solely on social innovation, using technology as a tool and instrument to advance societal change. The interconnectedness of social and technological innovation is only marginally considered.

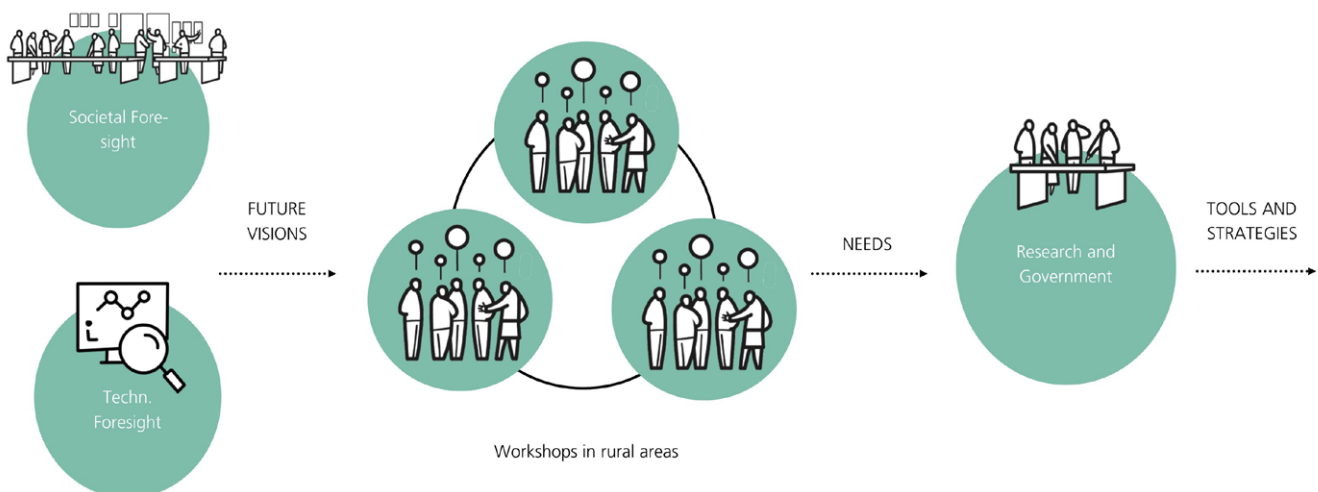
To align both the technological as well as the social dimension of innovation and integrate social innovation into R&D&I processes, we propose a lab integrating elements from both concepts. Such a social foresight lab may be employed at an early stage in the technology development process. Taking future technologies as well as societal needs as starting points, it aligns both developments. In such labs, experiments are predominantly used for enabling stakeholders to articulate their demands.

THE SOCIAL FORESIGHT LAB

We define a social foresight lab as a space allowing all stakeholders from the innovation system to interact, to learn and to experiment with future solutions. Its aim is to integrate social innovation into R&D&I processes. To this end, it takes societal needs as well as societal consequences of technologies into account and initiates networks and activities. Stakeholders are involved in the process to articulate societal needs and act as change agents.



Three types of laboratories in real-world contexts (LRW)



The Social Foresight Lab

In a research project called “Expanding Horizons” funded by the German Federal Ministry of Education and Science (BMBF), Fraunhofer CeRRI developed such a social foresight lab. The overall aim of the project was to improve knowledge and technology transfer in rural areas. To this end, the project proceeded over three stages. First, social needs were identified by means of both desk research and – more importantly – a workshop with societal actors. In collaboration with technology experts, observations gathered were then refined and translated into future visions, which in turn formed the basis for the second stage of the process. The second stage consisted of three participative workshops as part of which representatives of rural areas were given the means to articulate their needs with respect to future innovations and developments. These were then integrated into research and funding practice and policy during the third and final stage. To this end, said needs were discussed with both technology experts from the academic sector and representatives of research funding bodies. Thus, at its core, the process established an iterative approach taking social and technological dimension of innovation into account by means of involving multiple stakeholders.

During the second phase, the project team conducted real-world experiments in three rural areas. In total, 69 participants encountered speculative prototypes of future technologies on a walking tour through their hometown. These objects were installed in real-world settings, such as retirement homes or town halls. They visualized possible social and technological developments, e.g. in the field of future mobility solutions, working or living. Confronted with, for instance, a future mobility station, participants articulated their individual preferences with regard to autonomous vehicles and sharing activities. The project team observed participants’ interaction with the objects and discussed those in various focus group settings within the real-world environment. The real-world experiments allowed identifying needs for technology transfer, forming concrete ideas for rural development as well as new and enlarged

local networks. Furthermore, they enabled mutual learning among the diverse stakeholders present at the experiments.

Besides these experiments, the social foresight lab established a network of future-oriented regions. In this network, practitioners meet two to three times per year to discuss current developments, present good practices, formulate common positions and develop ideas for future research and development. It is a platform for mutual learning and science-practitioner transfer. As a result, the project identified six areas of action marking entrance points to develop the innovative potential of regions. These areas encompass diversity, economic prosperity, interconnectedness, image, future orientation and identity. All of these areas call for both social as well as technological innovation. For example, interconnectedness requires platforms and infrastructure solutions enabling actors in rural areas to connect with each other. However, it also requires actors to be willing to cooperate and adapt a new mindset as well as forums and methods enabling them to cooperate.

HARNESSING AND REALIZING SOCIAL INNOVATIONS THROUGH SOCIAL FORESIGHT LABS

The overall goal of technology transfer in rural areas is to support rural development, a process in need of both technological and social innovation. This interconnectedness was the rationale to set up a Social Lab in the first place. The overarching goal was translated into two objectives: first, harnessing social innovation for technology transfer by integrating societal needs of rural areas into innovation processes and exploring areas of usage for future technology; second, realizing social innovation by contributing to rural development. Achieving both objectives required us to adapt labs discussed in literature.

The presented social foresight lab starts from societal challenges. However, we did not only initiate projects and set up platforms to enable mutual learning among societal actors. Rather, we empowered civil society actors themselves to articulate needs for future technological innovations. We defined the problems an innovation was supposed to solve and the goal for research and development in a participatory process. A major challenge frequently plaguing public participation in innovation processes is known as the Collingridge dilemma: While the full functionality and impact of a given technology cannot be easily predicted until it is sufficiently developed and widely used, it is difficult to make any substantial changes to said technology at this point in time [5]. To address this challenge, the focus of our experiment was not to test an already existing technology and thus close down a development process. Instead, confronted with speculative futures, civil society actors were empowered to articulate their needs for future innovations. Thus, experiments in the social foresight lab open up discussions and R&D processes.

The future orientation of the lab is the central adjustment to existing lab approaches. This adjustment enables a participatory, needs-driven problem definition and provides a fruitful approach for initiating social innovation. Such lab enables RTOs to align their technology development activities with social innovation in the following ways:

First, the lab harnesses social innovation for improving technology transfer by integrating user's perspectives into R&D processes at a very early stage and observing speculative futures in real-life social contexts. Second, it realizes social innovation as it creates new networks among practitioners, addresses societal challenges explicitly, creates new meanings and collective understandings and provides new ideas for practitioners.

CONCLUSION AND OUTLOOK

Research on social innovation proliferates due to an increasing interest of government and society. It has evolved from an opportunity to a necessity. It has become the next frontier of innovation and the public demands for research and development to be oriented towards societal needs.

Large research and technology organizations like the German Fraunhofer Society have already adopted this orientation. However, it is still unclear how RTOs position themselves towards social innovation.

In this paper, we propose a definition of social innovation as the social dimension of innovation and argue that such understanding of social innovation requires new approaches and methods. We propose the social foresight lab as an approach which may be used by RTOs to harness and realize social innovations. Such approach enables the integration of societal needs into R&D processes, and enables RTOs to realize social innovation by setting up real-life experiments. It challenges existing technology-oriented research processes and enables RTOs to align their R&D processes, in particular their technology transfer activities, with social innovations.

The suggested understanding of social innovation and the proposed social foresight lab approach has the potential for RTOs to establish themselves as 'interaction enabler'. Doing so would allow them to actively participate in the transformation of innovation systems towards Quadruple Helix Systems. Furthermore, taking social innovation seriously enables RTOs to open up new business fields in at least three ways:

- First, RTOs may harness social innovation to improve their technology transfer.
- Second, by realizing social innovation, RTOs may position themselves as key actors in addressing societal challenges. For example, they may become active in regional development activities. With their technological expertise, RTOs offer a unique perspective in this area.
- Third, RTOs can integrate social innovation into technology foresight activities.

The social foresight lab approach is a complex, time- and resource consuming approach. Hence, relying on this approach for every technology development would be overly complex. Instead, the approach can be used to define overall societal challenges and goals of technology development and transfer. Thus, it can serve as a tool for strategy development.

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