Editorial Presentation
Popular users: why and how innovation research started to consider users in the innovation process

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Users have become popular in innovation research, innovation policy, and innovation practice (cf. Bogers *et al.*, 2010). They are no longer considered simply as a passive mass of adopters or consumers, but as a more or less active agency in innovation processes. Innovation research, for instance, has long since distinguished between several adopter categories in the diffusion process: innovators, early adopters, early majority, late majority, and laggards. These categories can be mapped on the diffusion s-curve and indicate a temporal order along which user agency may be analysed. Concepts such as "reinvention" (Rice & Rogers, 1980) or "domestication" (Silverstone & Hirsch, 1992) subsequently put more emphasis on the ways in which users may transform an innovation in later stages of the adoption process. In these cases, innovations, i.e. new technologies, usually come from elsewhere (i.e., manufacturers), but users are credited with more creative potential than simply adopting novelties (Kline & Pinch, 1996). In this vein, the turn towards "user-driven" innovations (Hippel 1988) decidedly shifted the creative potential towards (specific) user groups, transgressing the traditional distinction between producers and consumers (Oudshoorn & Pinch, 2003).

Users in innovation processes have been addressed under different labels, for instance: user innovation, open innovation, or participatory design and from different fields such as: management and innovation research, science and technology studies, or social innovation studies (cf. Hyysalo *et al.*, 2016). The main gist of these approaches lies in reclaiming hitherto neglected aspects, perspectives, or sources of innovations, thus arguing against a top-down producer-centred models of innovation by emphasising bottom-up user-centred modes of innovation. These approaches reconfigure ideas about pushes and pulls, about the constellations and locales in which invention and diffusion occur, and about the transformations of innovations as

they emerge and evolve over time and space. Aside from innovation research, users have also become more popular in innovation policy and innovation practice, as the contributions to this special issue demonstrate in a variety of difference cases. For instance, mission-oriented innovation policies call for the active participation of citizens or users through processes of co-creation or responsible research and innovation (cf. Robinson *et al.*, 2020). Concrete innovation practices might nonetheless differ from the intentions of innovation policy and the assumptions of innovation theory (cf. Kuhlmann *et al.*, 2010).

In line with *NOvation*'s critical approach to innovation and innovation studies, the contributions to this issue highlight the promises, problems, and tensions of engaging users in innovation processes. Their critical perspectives challenge the "pro-innovation-bias" (Godin & Vinck, 2018) of mainstream innovation theory and policy. Users are not primarily considered as effective agents supporting innovative activities, like in open innovation approaches, but as transformative, sometimes unruly, agencies, putting up resistance as opposition or withdrawing as disinterested non-users. Indeed, resistance to both technical (Guille-Escuret, 1993) and social (Bartels, 2017) innovation and non-use are central phenomena when it comes to considering users in innovation research. Such thinking challenges inclusivist ideas of diffusion while pointing to the exclusions and inequalities that might follow from innovations. For instance, even though user-centred design advocates the participation and inclusion of users, several contributions show how adverse effects might contradict the initial idea.

We are extremely happy to have received so many high quality contributions. They provide key insights into the diversity and complexity of user involvement in innovation processes. Through their critical reflections on the role of users in innovation-making, the authors scrutinize, all from different analytical and disciplinary perspectives, the popularity of users in innovation process as well as innovation policies and practices. They shed light on the unanticipated and unintended consequence of user involvement and how involving users might reify asymmetries of power.

Gabriela Bortz and Hernan Thomas open the special issue with an inquiry into user theories through the lens of inclusion/exclusion. With a focus on technologies for inclusive development, the authors review innovation studies and science, technology and society studies literature in search of users and user inclusion and exclusion. Their extensive literature review is supplemented with four technologies for inclusive development cases. The paper is concluded with a typology of user approaches based on inclusion/exclusion, identifying five stylized types of user participation, tied to different normative assumptions about what user-centeredness

is for. Bortz and Thomas analyze how bringing the inclusiveness/exclusion dimension into the literature on users in innovation may help to reveal blind spots that need to be addressed and how unveiling user theory may contribute to deepen our understanding of inclusion in technology making.

The contribution by **Hadrien Macq** puts policy and policy expectations center-stage in an analysis of users and lay citizens involvement in innovation-making in Wallonia. Macq analyses participatory innovation as a mode of governance introduced in Wallonia to combat structural challenges. Based on his analysis of discourses, he finds that participatory innovation is used by public authorities to (re)invent themselves and the society they govern. Within this interplay between user innovators and policy making, power plays a central role. Macq shows why and how participatory innovation became fashionable in Wallonia and how the (regional) State instrumentalized the concept of participatory innovation.

Benjamin Lipp, subsequently, also puts a strong emphasis on policy and policy expectations and assumptions, but does so with a focus on European, rather than regional, policy discourses and by turning the attention towards user involvement specifically in the development of frugal robots. Focusing on healthcare robotics, Lipp investigates the interplay between broader policy assumptions in the European discourse on user-driven innovation and its practical performance. He finds that the assumption on user-driven innovation actually restrict the agency of users and may cause conflict and contradictory outcomes. Building on a concrete case of Public end-user Driven Technological Innovation (PDTI) in the development of healthcare robotics, Lipp concludes that user-driven innovation is not simply about users driving innovation but about what he calls interfacing users and their concerns with (robotics) developers and their technology. He therefore proposes an analytics of interfacing.

From healthcare robotics, we turn towards digital technologies for people in old age. **Cordula Endter, Sebastian Merkel and Harald Künemund** study the involvement of older users in two funding programmes and discuss how older people are configured as users in technology development. They do so from the perspective of user-centered design. The authors lay bare the complexities of involvement of older users in technology development and elucidate controversies in social science research on user participation in innovation. In doing so, they critically reflect on technology development strategies as well as funding practices.

Julia Stilke and Sandra Buchmüller approach the involvement of users (and non-users) within the innovation processes from a feminist STS perspective. Counterbalancing a technocratic approach to sustainable aviation, Stilke and Buchmüller combine feminist STS with methods from participatory design and practice-based ontological design to analyse human demands of sustainable aviation.

In discussions with users and non-users, they find that conceptualizations and categorisations of users and non-users are highly situated. With a critical reflection on the role of researchers and the power structures, methods, theories and values that are prevalent, the authors advocate for power-critical reflections on the performative effects of the knowledge making process in inter- and transdisciplinary research projects.

Moving away from 'lay' or 'citizen' users, Philip Roth and Nadine Diefenbach, focus on organizational users. Roth and Diefenach depict organizational users as a distinctly different type of users, deserving more explicit attention in (user) innovation literature. They draw on empirical findings on interorganizational knowledge exchange and build on practice-theoretical insights to elucidate how the embeddedness of organizational users in the knowledge transfer process structures their integration. They therefore show how organisational users are distinct from private users within an innovation process because of the situatedness of their knowledge, their integration in the process, and the structures of organizations and organizational boundaries.

As with all scientific endeavours, the final papers that reach the eyes of the audience are, of course, the result of hard work of the authors. At the same time though, the usually anonymous volunteer reviewers provide helpful suggestions to improve research papers. In line with *NOvation*'s strive to implement an open review process, in which the reviewers are informed about who wrote the paper, while the authors also receive the names of the reviewers, we are happy to able to announce and disclose the names of the reviewers that contributed to the development of this thematic issue. Finding willing reviewers is no easy feat. We are therefore particularly thankful to (in alphabetical order) Susanne Brucksch, Diego Compagna, Maximilian Fochler, Gérald Gaglio, Bob Jessop, Robert Jungmann, Alexander Peine, Bonno Pel, Bianca Prietl and Sebastian Pfotenhauer.

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