

Track 3 - Bringing responsibility to firm practices: how?

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Wednesday 28th 13:30-15:30 – Session 1 – Chair: Tatiana Iakovleva

Thursday 29th 08:30-10:30 – Session 2 – Chair: Luciana Maines

Friday 30th 13:20-15:00 – Session 3 – Chair: Arnt Floysand

Session 2

Chair: Luciana Maines da Silva, Unisinos University, Porto Alegre, Brasil.

Abstracts

Integration of Responsible Innovation: A case of user inclusion in a digital healthcare firm

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The new suite of approaches and advancements in digital innovations in the healthcare sector has the potential to ensure socially desirable solutions if integrated with Responsible Innovation (RI). Although novel solutions in digital healthcare innovations offer potential to address complex and societal challenges, it remains ambiguous how and why RI processes should be integrated into firm practices. The theoretical developments on RI have had a focus on making normative models of responsibility and the literature have mostly concerned early-stage research projects rather than implementation at the firm level (Leminen et al., 2016; Lubberink, 2017; Thapa et al., 2019). As a response, there are recent studies that have focused on the relevance of RI for firm practices (cf. Gurzawska, 2021; Iakovleva et al., 2021; Oftedal et al., 2019; Riaz and Ali, 2023). These authors argue that while the principles of RI include involvement of users in the process, it remains unclear how and to what extent this is done in practice at the individual firm level (Silva et al., 2019). In this paper, we focus on which user to involve, how to involve them and when in the process to involve them. We do so by contributing empirically to studies of RI implementation in digital healthcare innovations at a firm level. To this end, we analyze a case of RI integration closely and conceptualize both the RI processes and embodied healthcare technologies as a sociomaterial (both human and nonhuman) practice.

In our empirical case, we followed the innovation development of a digital start-up in the healthcare sector longitudinally from 2021 to 2023, focusing on the engagement and inclusion of end-users. Our qualitative data was collected through undertaking 17 non-participant observations of user engagement and 31 semi-structured interviews with users, associated research fellows and employees from the case firm. Our analysis shows that the

users experienced two spatiotemporal dimensions that affected their engagement and involvement with the RI process in the firm: (1) physical organization and (2) social laws. Accordingly, we argue that these two dimensions must be considered when building an RI framework in order to address which user to involve, how to involve them, and at what stage to involve them in the process. Moreover, in order to create favorable conditions for RI 2 implementation at a firm level, we argue that it must be acknowledged that such an innovation process generates a multiplicity of sociomaterial assemblages, ambiguous spaces and spatial boundaries that can have a positive or negative effect on user involvement, and ultimately on the innovation process itself. Moreover, our study emphasizes the diverse ways in which actors understand and engage in RI processes, we do so by scrutinizing the innovation practices of digital technologies from a sociomaterial lens. Finally, the study presented in this paper invites further exploration of RI implementation on a firm level to gain a deeper understanding of the intricate interplay between digital technologies, user inclusion, and spatiotemporality. We deem this exploration necessary in order to allow for digital innovations integrated with RI to be able to create socially desirable solutions, not the least within the healthcare sector.

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Engaging Stakeholders in Healthcare Innovation: The Impact of Knowledge Types and Stages

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In the realm of Responsible Research and Innovation (RRI), it is crucial to engage multiple stakeholders in innovation(e.g., Callegari & Mikhailova, 2021). As primary users of medical devices, healthcare professionals and patients play a pivotal role in driving innovation in this field(e.g., von Hippel, 2005; Chatterji & Fabrizio, 2012; Oliveira et al., 2015). However, bringing together a diverse range of stakeholders is a challenging task. This is particularly true in Japan's medical and healthcare sectors, where there is a need for more active involvement from healthcare professionals and patients. In this study, we focused on types of knowledge and examined which healthcare professionals are more involved. The question is pivotal not only in identifying healthcare professionals likely to engage but also in understanding which individuals and organizations they need to collaborate with for successful healthcare innovation.

To understand what motivates or prevents healthcare professionals from participating in innovation, we conducted several types of research: a literature review, a series of interviews, and surveys. We discovered that lead-userness, prosocial motivation, and peer influence encourage participation. Conversely, the demand for time and effort on other tasks, such as clinical and administrative duties, tends to discourage it.

Our recent interviews indicated that the type of knowledge significantly affects involvement. There seem to be differences in the type of knowledge required by healthcare professionals in different stages of innovation, particularly between initial stages (like prototype development) and later stages (such as conducting clinical trials and complying with regulations). We examined what types of knowledge would lead to engagement and how it varies across different development stages.

Studies in user innovation, academic engagement, and medical device development have identified three key knowledge types essential for innovation. These are needs knowledge (understanding the problem and user needs), solution knowledge (technical expertise for problemsolving)(e.g., Schweisfurth & Raasch, 2018), and regulatory knowledge (awareness of healthcare laws and regulations)(e.g., Chatterji, 2009). Drawing from these insights, we propose two hypotheses: Hypothesis 1: In the early stages, healthcare professionals with needs knowledge and solution knowledge will be more actively involved. Hypothesis 2: In the later stages, healthcare professionals with needs knowledge, solution knowledge, and regulation knowledge will be more actively involved.

To test these hypotheses, we conducted a survey between November and December 2022 among healthcare professionals at a leading Japanese hospital. With 72 respondents, 44 of whom were engaged in innovation activities and 28 who were not, our Tobit multiple regression analysis revealed that solution knowledge significantly influences involvement in early-stage activities. In contrast, all three knowledge types were crucial in later stages. Hence, Hypothesis 1 is partially supported, and Hypothesis 2 is fully supported.

The study's results indicate that healthcare professionals with specific knowledge are more likely to engage in innovation. Our findings suggest that partnerships with manufacturers with deep technical expertise could enhance the healthcare professionals' involvement throughout the development stages. In addition, contacting patients and regulators might encourage their participation in later stages, where understanding both the problem (needs knowledge) and regulatory aspects is vital for overcoming barriers to practical application.

Applying these findings in future research to further investigate the role of patients could yield valuable insights.

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Stakeholder engagement and innovation management for responsible innovation outcomes: the case of firms in digital healthcare and welfare services

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With the growing influence of digital technologies and digitalisation, there is growing belief that digital innovation holds the promise of addressing healthcare and welfare service challenges by increasing productivity with higher quality and affordable costs. However, harnessing the potential benefits of digital innovation in the healthcare and welfare service sector for sustainable and responsible outcomes depends on how well firms address users' and stakeholders' concerns and expectations, and manage the innovation process. Literature on Responsible innovation advocates that for responsible innovation outcomes, it is essential that firms and entrepreneurs include stakeholders and users from the design phase of the innovation process to allow early anticipation of intended and unintended consequences of innovation that might cause stakeholders and users in the innovation ecosystem, reflect true value propositions and respond to their expectations and concerns to allow early need-solution interactions and to find optimal desirable solutions which are responsible and sustainable. However, how firms and entrepreneurs engage stakeholders, at what stage, and for what purpose to manage their innovation process to result in desirable, responsible, and sustainable innovation outcomes remains ambiguous. Through a longitudinal case study of six start-ups in the digital healthcare and welfare service sector, this study follows the innovation process in these firms and investigates the types of stakeholders and user engagement that the firms practice at different stages of the innovation process. Further, the study explores the impact of stakeholders and users inclusion in the innovation process and their outcomes. Our findings suggest that firms and entrepreneurs engage stakeholders and users at different stages of the innovation process. However, engaged participation or

inclusion of a diversity of stakeholders and users early in the design phase of the innovation process and throughout the entire process allows them early need-solution interaction and pivotal moments resulting in finding the optimal desirable solutions which bear the potential to solve users' and stakeholders' problems. The findings also suggest that firms particularly early start-ups with limited access to resources and networks find it challenging to practice inclusion in the innovation process. They feel that it is a time-consuming, tedious, and costly procedure and somewhat of a restriction for them to innovate faster. The study finds that although it is challenging in the short run, in the long run, the inclusion of stakeholders and users early in the innovation process pays off. However, there needs some supportive mechanisms and policy initiatives to facilitate the adoption and practice of inclusion from the early phase onwards to the entire phases of the innovation process. The study makes contributions to theory, practice, and policy. The study contributes by integrating the Inclusion-principle dimension of responsible innovation in the innovation process. It provides some practical guidance on when, how, and why to include stakeholders and users in innovation management for responsible innovation outcomes. The study makes some policy recommendations on the need and tools necessary for effective inclusion practices in innovation management.

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Catalyzing Change: Leveraging Stakeholder Collaboration in Developing Innovation and Business Strategies for Wood Waste

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The pressing need for climate change mitigation and global shortages of timber underscores the importance of addressing efficient and sustainable resource use. The increasing demand for biomass, both for energy and wood materials, along with a growing awareness of forest ecosystem services, serves as a fundamental driver for adopting sustainable practices and efficient resource utilization in both economic and environmental terms for wood waste management (Daian & Ozarska, 2009; Knoth et al., 2022). Better use of wood resources is also gaining support from legislative bodies, especially in Europe, where the reuse and recycling of materials often take precedence over incineration for energy production. A recent study revealed that one-third of wood recovered from buildings is suitable for high-value recycling, indicating that the potential amount of waste wood for recycling is significantly higher than the current utilization (Höglmeier et al., 2017).

Yet, in Norway, an estimated 815,000 tons of wood waste were generated in 2019; still, only 6% underwent material recovery, with the remainder being directed to incineration (SSB, 2021), indicating a large potential for wood waste utilization. However, developing innovations, business strategies, and new value chains for wood waste requires new ways of thinking and a mindset shift as the wood and construction sectors are well-established in current existing infrastructures, practices, norms, and standards. Yet, such a development compels collaboration between various stakeholders, including businesses, government agencies, and communities (Berardi & de Brito, 2021; Sudusinghe & Seuring, 2022). We strive to understand this by investigating a case study on the wood construction sector in Norway. The data input for this paper comes from a stakeholder workshop (approx. 30 participants representing designers, architects, builders, industry associations, and researchers) in the form of World Café organized in September 2023 and follow-up semi-structured interviews with relevant actors. By bringing together the stakeholders in direct and mutual dialogues, we intend to stimulate a joint discussion of common challenges in wood waste management and how the stakeholders could collaboratively tackle these challenges.

This paper sheds light on several challenges. Virgin wood and building materials in Norway are cheap, making disposal inexpensive and recycling unattractive. The disassembling and sorting process is resource-intensive and entails high costs, requiring specialized skills and knowledge. Regulatory barriers include restrictions on the use of reclaimed wood and unclear policies on recycling. There are no clear standards concerning sorting criteria and requirements, encompassing uncertainties about which elements of wood waste to consider, how the mapping process should be conducted, and who will be responsible for reusing, testing, and declaring reused materials. Furthermore, there is a lack of consensus on methods and industry interest in supporting standardization is limited. Insufficient market demand for products derived from recycled wood coupled with the weak economic viability and incentive to invest in the new value chains is another obstacle. Utilizing wood waste efficiently requires advanced technologies in all phases, from mapping, disassembling, and sorting wood waste to testing and categorizing wood qualities, which are not in place. There is also limited awareness among stakeholders about the potential value and opportunities associated with wood waste and the absence of a well-developed infrastructure for efficient collection and transportation systems.

Addressing these challenges involves a multi-faceted approach that includes raising awareness, improving infrastructure, revising regulations, stimulating market demand, and fostering collaboration among stakeholders. Stakeholders' discussion points to solutions such as establishing a "quality stamp" that can enhance resale value and instil consumer confidence in their purchases, incentivizing contractors to boost the demand for recycled materials, coordinating transport for the waste return with as few intermediate stations as possible, and especially elevating public procurement concerning wood waste.

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Empowering communities: the role of responsible research and innovation in social entrepreneurship

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Innovating for impact within the social entrepreneurship sector is complex due to the multifaceted nature of its expansive goals and influence on beneficiaries and stakeholders (Kickul and Lyons, 2020). In this paper, we examine the role that responsible research and innovation (RRI) has on three social entrepreneurial firms as they assist in solving a diversity of intractable problems in their own communities. RRI approaches innovation by assessing and anticipating the potential economic as well as social implications regarding research and innovation (Owen et al., 2013). It is a method that is both inclusive and sustainable (Von Schomberg, 2013; Taebi et al., 2014; Iakovleva et al., 2021) and emphasizes the integration of societal values, engagement of stakeholders, and consideration of potential impacts throughout the entire research and innovation lifecycle. Given its inclusivity, a benefit to incorporating RRI in the investigation of social enterprises is that it closely considers the perspective of the user (Stilgoe et al., 2013; von Schomberg, 2013; Taebi et al., 2014; Iakovleva et al., 2021; Oftedal et al., 2019; Riaz and Ali, 2023). This increases the sustainability of the innovation and the likelihood of successful adoption and institutional or systemic change for society.

The RRI framework (Stilgoe et al., 2013) has four key dimensions including 1) anticipation which involves identifying and assessing potential ethical, social, and environmental implications of research and innovation activities before they occur including anticipating both positive and negative consequences, exploring different future scenarios, and understanding the potential risks and benefits associated with emerging technologies; 2) reflection which emphasizes the need for researchers and innovators to critically examine their assumptions, values, and choices throughout the innovation process, to be transparent about their decision-making processes and to engage in dialogue with diverse stakeholders to gain different perspectives; 3) inclusion which involves actively involving a wide range of stakeholders in the process; and 4) responsiveness which is about being adaptive and open to feedback and changes based on the evolving understanding of the societal implications of the innovation.

For the three firms we examine in this paper, we describe how these dimensions are accounted for in the social entrepreneurship process: idea to innovation, measurement of impact, firm economic sustainability and scale and growth of firm (Kickul et al., 2018; Kickul and Lyons, 2020). These firms come from a variety of sectors including a non-profit focused on educational programming for entrepreneurs, a restaurant assistance firm initiated during the COVID-19 pandemic and a socially minded grocer that provides locally sourced, sustainable, and healthy products for the public. By integrating the RRI framework into the social entrepreneurship process, researchers can gain deeper insights into how businesses can engage in practices that not only benefit their own growth but also foster responsible and sustainable impacts for the communities they serve.

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