Transformative Research and Innovation

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(Alexander Myklebust, NTNU; Christian Wittrock, OsloMet; Ellen-Marie Forsberg, NORSUS)

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Session 1

Chair: Christian Wittrock, OsloMet, Norway

Abstracts

De-institutionalising growth-driven innovation: theories and practices of post-growth innovation

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De-institutionalising growth-driven innovation: theories and practices of post-growth innovation The concept of endless economic growth is undergoing increasing scrutiny from scholars and activists, prompting a reevaluation of alternative economic models to ensure sustainability and well-being for present and future generations (Kallis, 2018). Despite this, there remains a notable gap in the literature regarding the role of innovation in a post-growth era (Pansera & Fressoli, 2021). This presentation addresses the imperative for organizations to innovate for survival and expansion, often encapsulated in the "innovate or die" mantra. However, it critically examines how this mindset perpetuates assumptions such as technological determinism and productivism, which overlook the socially constructed

nature of technological development and its implications for societal equity and justice (Robra et al., 2023).

The presentation argues for the necessity of disentangling innovation from growth to envision a post-growth era effectively. It advocates for expanding the scope of innovation beyond technological advancements to encompass cultural and institutional changes, thereby redefining social order. Furthermore, it explores how organizations, particularly capitalist enterprises, serve as both proponents and perpetuators of the growth discourse, yet also present opportunities for challenging and developing alternatives to growth ideology. The presentation draws on the application of institutional theory to the field of responsible innovation (Owen et al., 2021). Addressing questions rarely posed by scholars in innovation, management, and organizational studies, the presentation delves into the potential characteristics of organizations in a non-growth paradigm. By drawing of a case study conducted at the Joint Research Centre of the EU at ISPRA, our contribution investigates the conditions required for science, technology, and innovation to flourish without dependence on perpetual growth, considering the implications for technological complexity, policies, infrastructures, and organizational structures. By tackling these questions, the presentation seeks to stimulate critical discourse and pave the way for transformative thinking in the field of innovation and organizational studies.

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Governing science through networks – the introduction of RRI as an example of governance

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The implementation of Responsible Research and Innovation (RRI) requirements in research projects funded by the Research Council of Norway (RCN) can be understood as research policy expanding into new areas. This shift can be analyzed through the framework of governance, described by Rhodes (2007) as "a new process of governing; a changed condition of ordered rule". I argue that network governance provides a fruitful perspective for understanding processes behind the implementation of RRI in Norwegian research.

From a "narrow" focus on research methodology, themes, and scientific impact, issues of social responsibility, such as inclusion and responsiveness, have been widely introduced through RRI. RCN describes the introduction of RRI in large-scale technology programs as "based on a paradigm shift in the fundamental understanding of the relationship between research and society", and a move "from linear models to interactive models" (Research Council of Norway, 2015b). This view is reiterated in its strategy (2015-2020) where research and innovation are described as a 'society-transforming' power and societal responsibility is underlined (Research Council of Norway, 2015a). Key staff describe the increased dependency between research and society, leading to weakened arms-length steering. RRI as a realization of systemic interdependency between research and society, and the need to steer research for the good of society (Gulbrandsen & Rynning, 2016).

Policy networks, as defined by Rhodes (2007, pp. 1246-1247), involve formal and informal institutional linkages between governmental and other actors. Within these networks, organizations are interconnected, relying on resource exchange to collectively pursue their goals. While not structured as a hierarchy, dominant coalitions within networks have the capacity to employ strategies within the rules of the game, to influence the process of exchange. Variation in actor discretion is a product of goals and actors power potential, defined by resources, rules of the game and the process of exchange. The Norwegian system of research can be understood as such a network. While research funding competition exist, the overall research system is better described as a network operating on trust and cooperation. Notably, van Hove and Wickson (2017, p. 225) identify an ambiguity in the acceptance of RRI among researchers stemming from a normative discrepancy between RRI and 'good science'. Furthermore, Åm et al. (2021, p. 282) highlight two challenges of social responsibility in research identified by RCN: a deficit in addressing societal challenges, and a knowledge deficit among researchers on science-society relations and consequences. These findings point to a dominant coalition driving RRI implementation.

Taking as a point of departure that research constitutes complex policy networks with different actors vying for influence over the process of exchange (system of research funding). How then can we understand the implementation of RRI?

While Owen and Pansera (2019, p. 26) describe RRI as "policy driven", Mejlgaard et al. (2016, pp. 18- 19) finds that some RRI researchers fear "RRI-washing", cosmetic adoption of RRI to tick-boxes rather actual change, can constitute a barrier for implementation. In contrast, Rip (2014, p. 9) argues "scientists will continue to be prudentially acquiescent", but more often held to account. These courses of actions can be understood as game-like interactions in network governance. Box-ticking and acquiescing as less powerful actors responding to the more powerful, while account holding signify efforts of dominant actors to enforce compliance.

I argue that implementation of RRI can be understood through the lens of governance as a process driven by the dominant coalition utilizing their resources (influence and agenda setting capabilities) to implement RRI within the rules of the game (existing research

funding scheme). A better understanding of the structures surrounding implementation can illuminate the process and provide key insights for practitioners.

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The Transformative Force of Action Research and Social Innovation Across Local Health and Welfare Services

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Fragmented health and welfare services threaten patient safety, health, well-being, and participation in society for mental health patients. Despite several national reforms addressing the problem, it persists, and a lack of mutual understanding between actors from different contexts is one the main challenges (Vik, 2018).

Action Research (AR) is suited to create transformations by addressing problems that exceed organisational borders and levels (Bradbury et al., 2019), and can be understood as the collaborative production of scientifically and socially relevant knowledge, transformative

action through participatory processes (Wittmayer & Schäpke, 2014). This research method aligns with the intentions of Social Innovation (SI) to facilitate sustainable systemic change through "change in social relations involving new ways of doing, organising, knowing, and framing" (Avelino et al., 2019, p. 145). Networks and temporal organisations can be used to create SIs, as they allow flexible and ad hoc organising between actors, providing opportunities for realigning and disentangling normative and cultural elements of institutions, exploring knowledge complementarities, assigning meanings, and collective sense-making (Söderlund & Sydow, 2019; Strambach & Pflitsch, 2020; Winch et al., 2023). This also offers low-risk opportunities for the actors to secure dimensions described for responsible innovation (Stilgoe et al., 2013).

Against this background, we propose the research question for this study: How can a portfolio of Social Innovation projects contribute to transformation across local public health and welfare services for mental health patients?

Design: This case study is part of an AR project aiming at transformation to provide coherent services for joint end users across four local public health and welfare organisations. A portfolio of SI projects and processes were conducted, and created new spaces for action and reflections for systemic learning through temporal organisations allowing multi-sector and multi-level involvement of actors in co-creative learning processes. To generate qualitative data for this study, we conducted longitudinal multistage focus group interviews Abstract for AFINO International Conference 2024 (n=6) and collected archival data. The analysis followed principles of reflexive thematic analysis (Braun & Clarke, 2022).

Results: We found that the portfolio of SIs projects contributed to transformative change concerning three themes. 1) From 'master and servant' to 'equal partners' concerned the change in power balance between the actors, 2) Transformation from ignorance to awareness of interdependence concerned the change in knowledge about the context of others, initiating change in practises, 3) Transformation from blaming to a sense of community and hope for the future described how the actors switched from blaming others for joint shortcomings, to see themselves as empowered parts of a local 'health community' and expressed a narrative of expectations to do collective problem-solving for the future.

Conclusion: This AR project demonstrated that it is possible to transform local health and welfare services for mental health patients on the micro level where the service delivery is practised. Using AR principles of participation and systemic reflection for planning and learning from actions, empowered local actors to cocreate new understandings of interdependence in joint tasks for transformative change across organisations. Transformation can be developed by facilitating extensive, but not too costly, social innovations, meaning change in relations and new ways of doing, organising, knowing, and framing between local actors in temporal organisations and networks.

Impact: This study presents knowledge that can be significant in transforming services for patient groups left behind, such as mental health patients, young patients, the frail elderly, and patients with chronic illnesses. It also contributes new knowledge to the broader

question of co-governance of transformation across silo organisations in the health and welfare services.

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Which type of responsibility is needed to realize the ambitions of RRI?

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Many proponents of RRI have stressed the inadequacy of the prevalent conception of responsibility, which is individualist and retrospective (Adam & Groves, 2011; Owen et al., 2013; Spruit et al., 2016; Von Schomberg, 2007; Wäscher et al., 2020). Some have stressed the need for developing a collective model of responsibility (Grinbaum & Groves, 2013; Owen et al., 2012, 2013; Von Schomberg, 2007; in a slightly different vein Spruit et al., 2016 have

argued the duty to unionize to build collective agency) and some have stressed the need to develop a prospective or forward-looking model of responsibility (Grinbaum & Groves, 2013; Owen et al., 2013; Pellé & Reber, 2015; van de Poel & Sand, 2021). I believe that both these dimensions of responsibility are central for a conception of responsibility which meets the ambitions of transformative RRI. The case that stresses the limits of retrospective responsibility has been made quite strongly by von Schomberg (2007), Adam and Groves (2011), Pellé and Reber (2015), and (with some qualifications) by van de Poel and Sand (2021). So, I take it as well established that while individual retrospective responsibility is not irrelevant for RRI, it is insufficient to achieve its ambitions. However, van de Poel and Sand (2021) have argued that a properly understood prospective individual responsibility is all that is needed for RRI and Grinbaum and Groves (2013) also give a substantial role to individual prospective responsibility. Both papers end up emphasising a virtue-based or care-based conception of responsibility.

My presentation contributes to the discussion of responsibility in the context of RRI by developing two arguments. First, I show that conceptions of individual responsibility as those developed by van de Poel and Sand, and by Grinbaum and Groves are inadequate to achieve the transformative goals of RRI and impose an unfair burden on individuals that lack power, resources and incentives for expanding their responsibility in the way suggested by these authors. Second, I outline the formal conditions for the construction of a joint responsibility among a set of collective authors. I claim that if RRI has the ambition of effecting a transformation of the research and innovation system, this kind of joint responsibility is necessary. The challenge is that this joint responsibility has to be built among a set of collective agents somehow linked but not having a shared decision-making mechanism. It follows that first it is necessary to show that some important gains can be achieved through an increased coordination and a willingness to change established practices. Second, an equilibrium point needs to be identified that constitutes a reasonably eligible option for all involved actors. Finally, a stabilizing mechanism that promotes compliance and mutual trust needs to be established. Because these conditions are difficult to meet in many circumstances, I conclude that the transformative ambition of RRI needs a type of joint responsibility that is unlikely to be achievable in many circumstances and therefore the systemic transformation is unlikely to happen. On the other hand, I suggest that the proposed formalisation of the conditions needed for building joint responsibility among a set of collective actors has much wider relevance than RRI and may help in building value-chains that are more responsive to ethical and social demands, something which is very needed to address the grand challenges of our times.

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Complex policy concepts and organizational anchorage: the case of RRI

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Complex policy concepts and organizational anchorage: the case of RRI The modern world is characterized by an increasing number of grand challenges, new geopolitical conditions, and new technologies, driving political attention towards finding novel solutions to increasingly complex problems. Responsible politicians face a choice of devising increasingly complex policies instead of resorting to the simplistic solutions offered by populism or rejecting the existence of complex issues altogether. This may drive the development of policy concepts that are both difficult to understand due to their complexity and equally difficult to implement. The European Commission's framing of RRI as keys may be one such complex policy invention.

In a European context, complexities regarding the consequences of new research and technology was picked up forcefully by the European Union in the seventh Framework

Programmes for Research and Technological Development and found its perhaps clearest expression to date in the subsequent Horizon 2020 programme (Owen et al., 2021). Building on previous concerns about Ethical, Legal and Social Aspects (ELSA) of science and technology, European Commission (EC) policymakers now pushed an agenda of "Responsible Research and Innovation" (RRI) (Rip, 2014).

Towards the end, the EC conceptualized RRI as comprising of six and later five keys (Forsberg et al., 2018); open access, gender, ethics, science education and public engagement. Through the Horizon 2020 programme many research projects tracing the prospects for the implementation of RRI in European research and innovation were funded, partly in efforts to spread RRI in and beyond higher education institutions. Quickly, a major concern became that the research establishment found RRI difficult to understand (Rip, 2016). Likewise, the disparate character of the five RRI keys means that there was no common best or promising practices for the implementation of the entire concept signified by the RRI label (Forsberg & Wittrock, 2023). In addition, studies tracing RRI implementation document that an often cited barrier is a lack of institutionalization (Tabarés et al., 2022), including a lack of dedicated organizational units responsible for the individual keys (Wittrock et al., 2021).

Conceptualized policies such as RRI may in themselves be seen as innovations (Strang & Soule, 1998). We know from innovation research that innovations that are difficult to understand and that appear complex to potential users do not spread easily (Rogers, 2003). Moreover, we know from organizational theory that implementation of policies, such as RRI, takes place in organizations which may––or may not––be accommodating of the policy (Pressman & Wildavsky, 1973) and which may have an interest in keeping silent about potential implementation issues (Brunsson, 1989), as well as giving the public impression that new policies are both endorsed and followed in the face of non-adoption (Meyer & Rowan, 1977). The dynamic of RRI as a complex policy concept in response to grand challenges thus deserves more attention than it has been given.

Drawing on data from a largescale Horizon 2020 project, tracking prospects of RRI implementation in 23 organizations in 12 countries, we show that a full-fledged implementation of RRI appears to require up to 14 organizational anchorages for its full institutionalization, and that this anchorage is mostly missing. Building on (Van de Ven, 1986, p. 604) suggestion that "an innovation or creative idea does not become an innovation until it is implemented or institutionalized" we suggest that there may be more effective ways of addressing grand challenges than devising and funding research on complex and disparate policy concepts such as the European Commissions' RRI concept building on 'keys'.

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Session 2

Chair: Alexander Myklebust, NTNU, Trondheim, Norway

Abstracts

REINFORCING RRI in mission contexts: lessons learned in key support and implementation activities

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Over the past 10 years, the concept of Responsible Research and Innovation (RRI) has largely evolved. New and current actors in the field often see themselves confronted with the need to familiarize with fast evolving methodological approaches (e.g., citizen science, knowledge valorisation), growing requirements (e.g., gender plans and sound data management approaches), new and old ways of calling RRI (e.g. the recent shift to Open and Responsible Research and Innovation, ORRI, and the lack of references to RRI in HEU's Work programme 2021-2022 and Strategic plan 2021-2024) and, above all, newly defined strategic priorities and pathways to respond to societal challenges (e.g., Mission-oriented R&I policies).

In the past, missions were often related to a well-defined outcome, such as putting a man on the moon, which mostly entailed technological challenges. However, modern missions, ranging from the demographic/ageing problem being faced by Western nations to the global challenges concerning climate crisis, are more complex because there are fewer clear technological challenges and outcomes are less clearly defined. At the same time, the directionality of missions demands new requirements, starting from the combination of top-down processes with bottomup approaches, including citizens in research and innovation processes. Mission-oriented strategies require support from specific sectors, but they are not sectoral policies; they are policies that get many sectors and actors to work together in new ways in all the phases of R&I unfolding, from design, to implementation and assessment.

Both (O)RRI and mission-oriented approaches move in the wake of giving orientation to research and innovation, bringing a series of common requirements (e.g., institutional change, openness and inclusion, responsiveness, anticipation of futures, etc.) and methodologies (participatory approaches, foresight exercises, technology assessment). The vast knowledge gathered through decades of EU projects and practices around (O)RRI can play a key role in supporting inclusive and fair research and innovation in mission-like contexts, starting from how meaningfully and seriously engaging all quadruple-helix actors in the generation and valorization of scientific knowledge.

Despite a strong EC's policy support towards key elements of RRI (such as citizen engagement) within Mission-oriented approaches, concrete examples of meaningful translations and experiences of RRI's four dimensions within Missions are still scarce. Through this abstract, authors aim at sharing two recent successful experiences which have and are currently contributing to critical engagement with mission-oriented innovation.

The first example consists of the pioneering experiences that have been run within the context of the EU-funded H2020 MOSAIC - Mission-Oriented Swafs to Advance innovation through Co-creation – project, in which multi-stakeholder engagement in the Mission "Cities" have been researched and tested, leading to open innovation outcomes. The second examples describe further efforts which are being implemented in order to reinforce and value the Open Responsible Research and Innovation (ORRI) legacy in the EU Missions. Such efforts are being implemented within the context of the EU-funded Horizon Europe

initiatives REINFORCING - Responsible tEerritories and Institutions eNable and Foster Open Research and inClusive Innovation for traNsitions Governance. REINFORCING is building a much-needed European central point of expertise on ORRI, providing access to resources and tools, delivering capacity building and mentoring services, assigning cascading grants through 7 open calls to institutions and organisations committed in either embarking on ORRI or consolidating their ORRI experience.

One of these open calls is planned for summer 2024 and will entails proposals aimed at implementing ORRI in Mission-like contexts. The details and the scope of the call are being shaped through engagement activities (namely workshops) with the members of both ORRI and Mission communities, identifying specific topics and challenges.

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Mission-critical – Mission-oriented innovation and its dis/contents

Cecilie Hilmer, University College London (UCL), London, United Kingdom

Research and innovation policies in Europe are increasingly oriented towards societal challenges (e.g. Grand Societal Challenges) or social benefit. This can for example be seen in the current framework programme of the European Commission, Horizon Europe. Its Mission Programme, which is highlighted as is most distinctive new feature, aims to steer research and innovation in the direction of five ambitious EU Missions (e.g. "Adaptation to Climate Change: Support at least 150 European regions and communities to become climate resilient by 2030"). These missions are to drive societal transformation, by asserting the dedication to socio-ethical value as funding condition for research and innovation. But what

kinds of omnipotent imaginaries of governance and control do these mission discourses bring to the management of scientific research and technoscientific innovation? Directing research and innovation towards societal goals includes a shift in roles and responsibilities, or at least putting these into renewed question. What is the 'new role' that is assigned to research and innovation for society - what is actually transformed in the process? And, what happens to democratic politics in the name of complete transformation?

The practice of EU Missions is still in its early stages, is evoking many questions and a new discourse as well as newly forming communities of practice. By critically exploring the emergence of mission-oriented innovation imaginaries within these communities, I argue that the discourse and practice around missions by policymakers involves (an attempt of) a powerful shift in focus of technoscientific governance from responsibility as individual moral decision-making (assigned to the scientific practitioner) to missions as the undeniable trajectory that technoscience must take to meet plantery-scale challenges such as climate change. These imaginations come to heads with established practice, unearthing deeper (and well known) tensions within what missions are aiming for with the help of science, for example between societal good and the growth paradigm.

Through the discourse of missions – including all of the connotations connecting missions to white Christian saviourism and the military – Europe's position as an "innovation leader" through large-scale infrastructural projects, is justified. In the process, local politics with its layered conflicts and ambiguities is neglected in favour of omnipotent visions of the greater universal good. Mission-oriented innovation threatens to obscure the subjective and tacit conditions and processes that bring about collective decisions through an idealised and universally understood "common good". Through the study of policy documents, interviews with policymakers, and grey literature on mission-oriented innovation in Europe, I explore how the totalising fantasies of missions are produced via forms of speech and legitimation, tacit value decisions about the common good, the articulation of challenges, questions, and conflicts. I argue that by placing the sites in which decisions in the name of a common good are to be taken within science and innovation projects, possible political questions and decisions are decentralised (Griggs et al., 2014) and neutralised – positioned within a context that still holds epistemic authority in order to make consensus more likely and yet threatening just that authority. My work connects to previous work on responsible innovation (RRI), in the hope that it could contribute to re-vitalize previous discussions (Shanley, 2021). Similar deficit logics as have been much criticised previously might be underlying these new policies, even if this may not be immediately apparent (Frahm et al., 2021).

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The mission to restore our oceans and waters – experiences from Brussels to Gjøvik

Siri Granum Carson, NTNU, Trondheim, Norway

In this presentation the concept of mission-oriented research and innovation will be discussed in relation to some specific experiences with the practical implementation of the approach in ocean and water-related research and innovation. The presentation is divided into three main parts:

The first part takes an overall look on the European Commission's "Mission Restore our Oceans and Waters by 2030", one of the five missions of Horizon Europe, from its initial phase in 2019-2020 to the current discussions regarding the status of the missions and their potential (dis-)continuation in the 10th European framework program. This part draws especially on experiences with citizen engagement processes in the implementation phase, and on participation in different EC Mission Ocean forums.

The second part focuses on the construction of Mission Mjøsa as a broad research program initiated and led from NTNU and featuring a large number of public and private partners. Mission Mjøsa has been "pledged" as a Norwegian contribution to the so-called "Mission Charter", an initiative by the European Commission's Mission Ocean management. Mission Mjøsa aims to implement some of the key features of mission-oriented research and innovation, with a particular emphasis on interdisciplinarity and public engagement.

On the background of these experiences, the third part of the paper discusses some of the opportunities and challenges that come with a mission-oriented approach to research and innovation. In particular, the discussion will revolve around two inherent conflicts of the concept: Between top-down vs. bottom-up approaches, and between the objective of inclusiveness vs. that of purposefulness. Further, the concept of mission-oriented research and innovation is put into relief by comparing and contrasting it with the concepts of responsible and/or transformative research and innovation, concepts which may provide tools for critical engagement with the idea of mission-oriented research and innovation.

Track 2 - Brave new RRI: challenges for early career researchers and biotech

 (Anne Blanchard, UiB/AFINO; Giovanni De Grandis, NTNU/AFINO; Anamika Chatterje, NTNU/DLN)

Wednesday 28th 17:00-18:15 – Session 1 – Early career researchers challenges
                                   Chair: Anne Blanchard & Giovanni De Grandis

Thursday 29th   17:20-18:30 – Session 2 – RRI in biotech
                                   Chair: Anamika Chatterje

Session 1

Chair: <u>Anne Blanchard,</u> University of Bergen, Norway, and <u>Giovanni De Grandis</u>, NTNU, Trondheim, Norway.

Abstracts

Exploring Responsible Research and Innovation (RRI) in Biotechnology: A Systematic Literature Review

Olga Mikhailova, Norwegian University of Life Sciences NMBU, Ås, Norway

Responsible Research and Innovation (RRI) has emerged as a crucial science policy measure aimed at establishing ethical guidelines in scientific endeavors and fostering inclusive and sustainable research and innovation processes. This policy-driven initiative addresses public skepticism towards science, enhances evidence-based policy-making, and strengthens democratic societies in dealing with emerging technologies. RRI, designed as an integrative framework, accommodates diverse initiatives to foster collaboration among societal actors, aligning innovation processes with societal needs, values, and expectations. While the implementation of RRI practices has been evaluated across various contexts, this systematic literature review focuses on the biotechnology sector, with a specific emphasis on genetically modified organisms (GMOs). The controversial nature of genetic modification and its potential transformative impact on society underscore the relevance of exploring how RRI is interpreted and implemented in this field. This study aims to investigate points of reference to the RRI framework within the biotechnology sector, especially concerning genetically modified organisms. The systematic literature review employs key themes, including RRI and Biotechnology, and utilizes search terms expanded with relevant synonyms mentioned in selected articles. The search will be conducted across reputable databases such as Web of Science, Science Direct, and Springer Link. Through a comprehensive examination of existing literature, this review seeks to identify and evaluate examples of RRI policies and practices within the broader biotechnology industry. The study will delve into topics most prominently present in the literature to gain insights into how responsible research is

essential in navigating the complex ethical, safety, and societal challenges associated with manipulating living organisms and genetic material. The outcomes of this systematic literature review will contribute to a better understanding of the dynamics of RRI implementation in the biotechnology sector, providing valuable insights for policymakers, researchers, and industry practitioners. The synthesis of knowledge derived from this review will be presented in a written report, offering a comprehensive overview of the current state of research and debates relevant to RRI in biotechnology and genetically modified organisms.

Public Sector PhD within the Field of Education: Transformations in Research and Practice

Tony Burner[1], and **Anna Synnøve Hovstein**[2]
[1] University of South-Eastern Norway USN, Drammen, Norway; [2] NTNU, Trondheim, Norway

In Norway, the Research Council (RCN) has had a particular focus on the need for greater innovation in the public sector, whilst also highlighting considerable challenges. The challenges include a general climate of risk-aversity, a lack of resources allocated to innovation, ineffective decision-making processes, piecemeal approach to improvements and too great a divide between research and practice. One response to these challenges has been RCN's establishment of a public sector PhD program (OFFPHD), which is comparable to professional doctorates outside of Norway (such as in the UK). Practitioners complete a doctoral research project at an academic institution, whilst maintaining their position of employment within the public sector. The field of education has been afforded a particular attention in OFFPHD and PhD candidates within this field represent the largest doctoral candidate group. A national network for OFFPHD (NATPRONET) in the field of education provides 'a home' to the community of PhD candidates.

This presentation seeks to challenge the notion of a perceived gap between research and practice through reflections on the potential public sector PhD program within the field of education has for transforming knowledge from research and practice. Such programs have the potential to bring about innovation and co-creation of highly relevant knowledge and practices and can therefore contribute to transformations of university-practicum relationships. As an alternative to one-directional transference of knowledge from universities to practitioners, public sector PhD program provides 'knowledge exchange' in which researchers interact and inquire with stakeholders to bring about new and better understandings. Scientific progress in educational research can thus become a social venture in which people are essential part of designing solutions and enacting change. Arguably, researchers who are situated within the field of practice, such as public sector PhD candidates, are best suited to facilitate and transform educational research and practice.

The presentation discusses the opportunities, dilemmas, challenges, and contradictions of OFFPHD within the field of education and the associated national network, NATPRONET.

Reflecting on fostering reflexivity for crop scientists in an interdisciplinary training centre using journalling

Emily A. Buddle[1], Rachel A. Ankeny[2]

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This paper, to be presented by an early career postdoctoral scholar and a senior researcher, provides a detailed analysis of experience to date of structuring and implementing a responsible research and innovation (RRI) focused training program within a larger research training centre focused on training the next generation of researchers, policymakers, and industry leaders in socially responsible genetic and field technologies such as gene editing and synthetic biology technologies in crop breeding. We focus in particularly on the part of our broader research program which involves the development and use of a journalling method to foster greater reflexivity about scientific practices, disciplinary and institutional norms, social reception and ethical considerations, and regulatory processes, and indirectly to promote deeper consideration of the key components of RRI approaches. Although reflective learning journalling has long been used in a range of fields and settings including for educational purposes, there is limited evidence about its use with participants who have lower levels of familiarity with reflecting on and writing about their experiences, especially in scientific settings, or about how such processes can lead to development of skills relating to RRI. We explore how more ritualised or familiar activities such as keeping lab books can be harnessed to allow researchers-intraining opportunities not only to document and consider scientific details, but also to reflect on the complex socio-technical challenges particularly in an emerging field.

We consider some of the problems encountered which have included diversity in types of prior education and pedagogical methods, particularly given our cohort's background which crosses numerous countries, leading to different baseline approaches to writing and engaging; providing accessible yet provocative prompts; and delivering the research using online methodologies which often can be less effective for fostering additional dialogue and reflection. We also provide insights for other researchers who might wish to use similar methods, along with our preliminary findings after one year.

Session 2

Chair: Anamika Chatterje, DLN/NTNU, Trondheim, Norway

Abstracts

The Research Ethics cards as a RRI tool: Reflections concerning power asymmetry

Hedda Smedheim Bjerklund, UiT-The Arctic University of Norway, Tromsø, Norway

Over the past ten years, the concept of Responsible Research and Innovation (RRI) has gained particular visibility, both in policy context as well as within academic discussions concerning science and technology. As a part of the main strategy of the Research Council of Norway's RRI framework, RRI is emphasized as a new attempt to mitigate the asymmetry between science and society (Forskningsrådet). However, the concept of RRI has been criticized for its unclarity in how the idea of RRI should or could be interpreted practically (Burger et al 2017; Owen et al 2012; Forsberg and Wittrock 2021). Here I present experiences of using the 'Research Ethics cards' (Millar et al. 2022) as a methodology of enhancing reflexivity in a research project using novel technology such as advanced microscopy and gene technology approaches to study if microplastics have biological effects. The methodology helped researchers identify and reflect on ethical aspects of their research and demonstrated the need for RRI in biotechnology projects. Yet, as a common problem concerning RRI work on reflexivity, the methodology was not able to address the ways power operates influencing knowledge production which may undermine scientific inquiry, RRIs overall aim and the goal of enhancing reflexivity. By considering three ways power influence knowledge production, I suggest that the methodology do have the potential in addressing problems of power asymmetries between the RRI facilitator and the participants, as well as within the research group. The third, however, call for a stronger framework and integration of RRI.

First, in RRI work on reflexivity, employing expertise, such as including an 'embedded humanist' or 'social scientist' risk creating a power asymmetry where employing RRI in technology projects become a one-way discussion and that the 'expertise' owns the question and the answer. When using the Research Ethics cards, the cards provides both a definition and a question in a way that the questions from the cards dictate the topic of discussion and the definitions balances the power relations even further by ensuring that everyone start from the same point regardless of their prior knowledge of the concept. Second, in work on reflexivity, there is always a risk that hierarchies and power within the research group influences who gets to take part in the conversation, as well as what perspectives are included in the reflections and discussions (Fricker 2007; Pohlhaus 2012). As of the Research Ethics cards today, the cards do not ensure that the conversation is equally shared between participants nor make visible the participants' social situatedness impacting how far a speaker is trustworthy, or the facts of hierarchies and power within the group. On the other hand, by adding cards addressing social situatedness, hierarchies within research groups and identity power, the methodology has potential to recognize power dynamics and thus ensure that all viewpoints will be voiced.

The third relates to the overall aim of RRI, such as mitigating asymmetry between society and science. In doing so includes recognizing the power structures which scientists as a social group is embedded in. Yet, leaving the scientific community to both reveal and mitigate these structures are unreasonable. Instead, there is need for a stronger framework and integration of RRI. When keeping these power structures hidden undermines societies' trust in scientific knowledge and creates even more distance between science and society

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Exploring ethical dimensions of AI therapy design tools in Precision Oncology through SPARK: The example of the NTNU DrugLogics

Viviam Bermúdez, NTNU, Trondheim, Norway

Functional precision medicine offers a crucial opportunity in oncology, allowing treatment design and testing in patient companion models. The DrugLogics initiative at NTNU is working to create tailored computer cancer models to match specific cells, organoids, and potential patient profiles. This will allow us to simulate how different drugs might affect cancer models, helping us to choose the best possible treatments to be tested. A Ph.D. project has been allocated to carry out the computational aspects of developing an Artificial Intelligence (AI) therapy design or decision-support tool. However, the project may be subject to strong ethical implications, especially regarding issues related to patient safety and the dynamics of the doctor-patient relationship. The platform developed under this project can collect and analyze data directly from patients. Therefore, one of the focuses of the Ph.D. project is to address ethical concerns. One way to do so is by fostering an open dialogue around the functionality and potential of AI therapy design tools. The intention is to actively involve in these discussions the future communities that could be affected by precision medicine: patients and healthcare personnel. To this end, the SPARK (Sharing Perspectives and Reinforcing Knowledge) activity was developed to address societal needs and problems from the main research project and made possible with funding from the Center for Digital Life Norway (DLN). The activity consists of creating a card game about

the ethical aspects of precision medicine and AI design tools. The game is a semi-structured group discussion designed for 4 to 8 players and played in three stages: information, discussion, and response. In the final stage, participants attempt to reach a consensus on the ideal policy position for research, development, and implementation of precision medicine using AI therapy design tools. The game is shared and played by the end users and the academic community in three different events taking place during 2024 in Norway. The information gathered during the events will inform the main research on opinions and perspectives from the public regarding AI therapy design tools. This will help shape the future of precision medicine at NTNU DrugLogics and across the academic community. The insights could also be used to inform future policymaking and decision-making processes, ultimately benefiting a wider range of stakeholders in medical AI research. By establishing collaboration with different communities outside academia and creating activities beyond the main computational tasks, the project takes a transdisciplinary turn, enabling Responsible Research and Innovation (RRI), Open Science, and participatory Research. Here, we present the main challenges and experiences of integrating the SPARK activity into the NTNU DrugLogics project.

Envisioning the Future of Foods: The Intersections of "Sustainability", Dietary Lifestyles and Gene Technology in Australia

Christina Wenzl, The University of Adelaide, Australia

Our global food systems are facing "sustainability" concerns, heightened by the challenges of climate change. Popular and often sociopolitical movements, such as the move from animal to plant proteins, and scientific trends, such as crop development using gene technologies may foster greater social, ecological, and economic "sustainability". However, the perspectives of individuals living plant-based lifestyles towards gene technologies have yet to be explored.

Animal-based proteins, particularly meat, have been identified as having detrimental effects on e.g., human health (Ferrari et al., 2022) and the environment (Cellura et al., 2022). High meatconsuming countries like Australia are encouraged to embrace more "sustainable" food practices (Williams & Price, 2010). Studies highlighting the impacts of protein consumption on "sustainability" suggest reducing animal-based protein intake and moving towards a larger consumption of plant-based proteins (Cellura et al., 2022; Ferrari et al., 2022; Williams & Price, 2010).

The potential roles of various types of biotechnology in improving the "sustainability" of food production have also been of increasing academic interest. A recent review published by Sharma et al. (2022) summarizes the use of genetic modification (GM) and gene editing (GE) in applications to promote "sustainability" and suggests that biotechnology has the potential to address climate change, food security, sustainable agriculture and forestry, food processing, and chemical manufacturing. Of relevance to this research, GM and GE technologies can e.g., help to increase crop yield while reducing the use of resources such as water, energy, and agricultural chemicals.

However, concerns have been raised about the use of GM and GE in food production, including potential risks to human and environmental health (Sharma et al., 2022).

Responsible research and inclusive innovation (RRII) in "sustainable" food production and consumption must involve publics, including those who follow alternative dietary lifestyles, like plant-based ones. While recent academic literature has highlighted gene technologies and plant-based proteins as "sustainable" food pathways, the views of individuals adopting plant-based lifestyles towards these technologies have not been explored. This is despite the possibility that the adoption of such lifestyles may be motivated by concerns about "sustainability". Exploring these perspectives could contribute to our understanding of the relationship between sustainability, food technologies, food values, and dietary lifestyles.

In this presentation, I will contribute to track 6, "What is meaningful RRI in biotechnology and the life sciences?" I will examine the perspectives of individuals following plant-based lifestyles and those with 'conventional' dietary habits in Australia, focusing on their views on the use of gene technologies in food production and consumption. This analysis is based on focus group research and will provide insights into a) the participants' understandings and knowledge of gene technologies, b) attitudes and perceived risks/benefits associated with the use of gene technologies in food production and consumption, and c) imagined futures of "sustainable" food production and consumption.

Drawing on my analysis, I will illuminate perspectives from alternative dietary lifestyles and their contributions to general food values, definitions of "sustainability", value conflicts regarding food technologies, and the importance of exploring the interplay of values, conflicts and trade-offs for Responsible Research and Inclusive Innovation (RRII).

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Track 3 - Bringing responsibility to firm practices: how?

(Tatiana Aleksandrovna Iakovleva, UiS; Elin Merethe Oftedal, UiS; Arnt Fløysand, HVL; Luciana Maines, Unisinos University, Porto Alegre)

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 1

Chair: Tatiana Aleksandrovna Iakovleva, University of Stavanger, Norway.

Abstracts

Mainstreaming responsible innovation in business: a comparative systematic review of business ethics and innovation management literature

Agata Gurzawska, Trilateral Research, Waterford, Ireland

With the arrival of more disruptive technologies, it is important and urgent to have systemic solutions to integrate responsibility into the companies' technological innovation. While various existing studies provide comprehensive state-of-the-art literature reviews on responsible innovation (RI), this study takes a unique approach and focuses on (1) the integration of RI in mainstream research on business responsibility and innovation, and (2) proposes a future research agenda. Specifically, this paper addresses the question of to what extent two major bodies of literature, namely business ethics (BE) and innovation management (IM) have integrated the concept of RI and how they perceive it, whether they are convergent or rather different from the policy-making and academic conceptions.

The analysis reveals three main themes across the BE and IM literature streams, namely (1) the benefits of RI; (2) the drivers of RI; and (3) the implementation of RI typically including internal aspects of the company (internal environment), such as organisational culture and employee engagement, leadership and knowledge management, and external aspects of the company (external environment) such as stakeholder engagement. The results show that RI in business is not entirely unknown, however, companies focus on the outcome of innovation, namely products, process and services, and their impact on society and the environment and how they contribute to addressing grand societal challenges. RI in business is about innovation that does not harm people and the planet, but at the same time, it moves a step forward ("doing good"), and contributes to sustainable development. RI is thus about companies redefining the purpose of the technologies they develop and ultimately the purpose of themselves doing business. It is evident that both streams of the

literature search for connecting RI to the company's strategy. Nevertheless, there is relatively limited discussion about systematically organising the process of innovation in a responsible, ethical and sustainable way. There is therefore a significant gap between how policymakers and scholars define RI, and how companies perceive it. The RI conception in business is still in a sensitive phase of theory building.

Finally, this study proposes an agenda for future research to better understand the theoretical and practical perspectives of RI in business including open research gaps and new paths that could be pursued by researchers in the future. Those gaps and future research involve questions related to two aspects (1) the conception of RI in business, and (2) the implementation of RI by businesses.

Are Innovation Ecosystems Supportive of Responsible Innovation?

Luciana Maines da Silva[1], Kadigia Faccin[2]

[1] Unisinos University, Porto Alegre, Brasil; [2] Fundação Dom Cabral, Brasil

The field of entrepreneurship, particularly through discourses about innovation ecosystems, often promotes the idea that innovation generates positive social and economic outcomes (Stahl, 2022). However, this view is challenged by authors like Jasanoff (2011) and Nathan (2015), who argue that the benefits and disadvantages of innovation are unequal. They emphasize that technological innovation can impact human rights, moral claims, economic status, and other significant aspects of individuals and groups affected. This perspective brings to light ethical issues arising from new technologies, which are currently a central point on political agendas, accompanied by detailed and thorough public debates (European Commission, 2021). Stahl's study (2022) criticizes the current discourse of innovation ecosystems for not paying enough attention to ethical issues, highlighting this gap in the literature and questioning how it can be overcome. Startups represent a contemporary and innovative way in which technological innovations are introduced to the market, challenging us to consider their economic benefits and the ethical and distributive implications of these innovations. In the wake of looking at startups, it is important to highlight that these companies are often inserted in innovation ecosystems, which "is the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors (Granstrand & Holgersson, 2020). Many startups connect more directly with incubators, technology parks, or even smart cities, seen as urban innovation ecosystems (Camboin et al., 2019). Startups continuously receive mentorship and feedback about their products, especially when participating in acceleration programs or pitching their ideas to investors and potential customers. Regular evaluation and guidance are crucial for startups to refine their offerings, align with market needs, and understand the broader impact of their products or services. Involvement in these programs provides startups with opportunities to gain insights from experienced entrepreneurs, investors, and industry experts. Such interactions enhance their business strategies and bring to the forefront considerations about their innovations' ethical, social, and environmental implications. Furthermore, this constant cycle of feedback and mentorship within innovation ecosystems prompts a critical examination of these ecosystems. It raises an

important question about the nature and effectiveness of support systems in fostering responsible innovation. Specifically, it leads to the pertinent research question: "Are Innovation Ecosystems Supportive of Responsible Innovation?" This inquiry delves into whether these ecosystems encourage innovation and business growth and ensure that these innovations are developed and implemented ethically, socially responsible, and environmentally sustainable. Addressing this gap, this study explores how startups incubated in Technology Park incubators foster innovation, centering on four dimensions: anticipation, reflection, responsiveness, and inclusion. Currently in the data collection phase, the study anticipates completion by February/24, encompassing a sample of approximately 300 Brazilian startups. Employing a structured questionnaire blending quantitative and qualitative inquiries, the data analysis hinges on the qualitative comparative analysis (QCA) methodology. This method allows for a fusion of qualitative and quantitative techniques to distill data and construct novel theoretical frameworks (Schneider & Wagemann, 2010)

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Innovation Communities: creating bottom-up spaces for responsible innovation - the case of intelligent biomanufacturing

Alexandra Müller[1], Robaey Z[1], Asin Garcia E[1], Martins dos Santos V[1]
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In the Industry 4.0 era, research and business sectors are presenting increasingly bold solutions to address our global crises. This era of technological and scientific advancement,

while promising, brings a unique set of challenges with it. 1,2 As we delve deeper into the intricacies of specialized fields, the risk of losing sight of the overarching goal – creating a sustainable world – increases. 3 The emerging field of intelligent biomanufacturing serves as a prime example of this complexity, necessitating a multifaceted understanding of the synergy between informational, technical, and biological systems. For novel processes like these to have impact, an integration of sectors such as ecology, agriculture, end-of-life product and waste management become crucial to create circular production processes. Additionally, considering insights from ethics, consumer advocacy, regulation and the media are relevant for creating accepted and sustainable technologies. 4 This leads us to a pivotal question: How can we create a space that embraces a diversity of sometimes conflicting viewpoints, to ultimately optimize decision-making processes and cultivate a sense of collective responsibility?

The answer may not be straightforward, but it is clear that no single entity can shoulder this responsibility alone.5 It is in this context that the creation of specialized communities of practice (CoPs) for innovations emerges as a silver lining. CoPs are a network of people with diverse competencies who share a common interest and regularly meet to discuss concerns of the shared interest. The basic idea behind CoPs is an age-old one, but these communities are being increasingly recognized as a tool for effective collaboration, being a foundation of varied practitioners and a channel for successful knowledge transfer. 6–8 Establishing CoPs could deliver answers to questions as on how to ensure that all stakeholders remain engaged, informed, and educated about cutting-edge developments? Or how to accelerate solving problems that demand an increasingly interdisciplinary approach to be truly safe and sustainable? And how can we guarantee more flexible, and yet resilient, approaches to produce our daily goods, new therapeutics or to mitigate pollution?

Recognizing the potential of transferring the concept of CoPs to an innovation landscape, our focus shifts towards creating a comprehensive framework to facilitate their formation. Offering an environment for people from the quadruple helix concept9 , potentially fostering open science, an honest sharing of concerns and room to find solutions for challenges we urgently need to address. To create this ecosystem of experts for collaborative problem-solving and innovative thinking, we will create innovation communities (ICs) by: (a) defining the clear scope and aims (of the novel biomanufacturing process), identifying specific challenges and uncertainties; (b) identifying and engaging relevant internal and external stakeholders, building (interdisciplinary) partnerships and collaborations; (c) develop a governance structure to ensure efficient management of the community; (d) create communication platforms for regular meetings and workshops for an easy collaborative environment; (e) create a knowledge-sharing culture, which includes open dialogues on concerns regarding intellectual property sharing and data management; (f) creating feedback loops, that access and evaluate the progress and impact of the ICs; and (g) developing a long-term vision for the sustainability of the community.10–12

The authors are part of four large EU and national biomanufacturing projects, where the methodology for ICs is introduced and revised through an iteration of workshops. These will set the stage for a profound exploration on how innovation communities can nurture responsible innovation. At the end, we aim to culminate our lessons-learned in a guideline for cutting-edge solutions. These will be designed universally for widespread utilization. The objective is to offer a clear, accessible pathway for the establishment of innovation

communities, ensuring that knowledge is not just generated but shared, discussed, and applied effectively.

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From Vision to Action: Empowering Innovation Managers and Technology Developers in Responsible Care Technology Innovation

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In 2018, the King Baudouin Foundation, a Belgian philanthropic organization, initiated a project call focused on care technology to enhance the quality of home care. The large response of 58 proposals also revealed significant deficiencies. Recognizing the need for a guiding framework to foster human-centered technology aimed at enhancing the quality of life, the Foundation embarked on a participatory strategic foresight process, resulting in the development of eight actionable caring technology principles (8 CTPs), as outlined in a forthcoming paper (under review in JRI).

Subsequently, a learning community was established to raise awareness regarding the 8 CTPs and to facilitate the sharing of experiences related to their adoption and integration into the innovation cycle of health technology enterprises and care organizations. This community, comprised of citizens, patients, healthcare professionals, technology developers, and academics, convenes regularly.

Tools that foster responsible and sustainable health technology innovation are being cocreated and undergoing testing. Inspirational use cases are shared and documented. A common language of the 8 CTPs has been developed through stakeholder consultation, and an inclusive version of the 8 CTPs is currently being tested with both Dutch-speaking and French-speaking participants. The added value of embracing and implementing the 8 CTPs is being investigated across all stakeholder groups.

This presentation will focus on the practical application of the 8 CTPs, which closely align with principles for responsible innovation, within the health technology industry. A tailored tool designed specifically for innovation managers and technology developers is now being introduced. Experiences concerning its utilization, challenges encountered, and opportunities will be shared at the conference. The tool starts with a self-assessment exercise, evaluating adherence to each principle against predefined objectives. Markers delineating various levels for each objective have been established. A spiderweb visualizes the current state alongside the desired state. Additionally, for each objective, indicators facilitating change and practical tools to attain the desired outcome are linked, including methods for user engagement. Living labs, involved in the co-creation and testing phases, bridge the gap between end-user involvement and technology development, aiding health technology developers in determining when to engage diverse stakeholders, including endusers, throughout the process.

These tools should be regarded as instruments fostering dialogue on inclusive design processes rather than checklists in the narrow sense of a tick-the-box exercise. They aid in identifying blind spots during the development, implementation, and evaluation of caring technology.

The next phase of the learning community involves engaging investors and funding organizations, aiming to incorporate the 8 CTPs as assessment criteria for co-funding initiatives.

By integrating these principles into health technology innovation, it is possible to build a more just, trustworthy, and autonomous care technology ecosystem that prioritizes the wellbeing and rights of citizens and benefits society.

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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 dissembling 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, dissembling, 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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Session 3

Chair: Arnt Floysand, Western Norway University of Applied Sciences, Bergen, Norway.

Abstracts

Innovation-Quality - An approach to responsible and more sustainable innovation

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From an entrepreneurial point of view, innovation is the key to staying in the market in the long term and remaining competitive[1]. At the same time, the pressure on companies to innovate is constantly increasing due to the ever faster world and the associated digitalization[2]. Innovation in a company is usually focused on efficiency, if not profit orientation. The aim is to fulfil the wishes of the market, design processes efficiently or even generate new needs. Innovation is therefore not only a blessing, but also a curse: not only is a better standard of living created, but global challenges (such as climate change, etc.) are also only made possible by innovation (negative external effects). This can be seen, for example, in the industrial revolution and its global consequences, e.g. through modern mobility[3]. The responsible implementation of innovations in the company often fails against the background of this corporate orientation. An extreme example of this is the Volkswagen emissions scandal, which pushed the focus on generating profits and competitive behaviour on the market to the fore. But even beyond such scandals (and corresponding misbehaviour), greenwashing - including in the social sphere - seems to be on the agenda in many places[4]. Many companies want to improve their image and are responding to the pressure of demand for more responsible behaviour. However, beyond this, business as usual is usually pursued and effects often fizzle out or do not find their way into the implementation of innovations[5]. In our presentation, we want to take a closer look at this area of tension in innovation within the company. The main hypothesis to be put forward here is that concepts of innovation quality manage to mitigate these tensions. In a first step, we want to define innovation in the entrepreneurial field in the Schumpeterian sense of creative destruction in order to analyse the outline of the problem of responsible innovation in companies presented above[6]. We will then argue in favour of a concept of innovation quality and how this can help to create more responsibility and sustainability[7]. Innovation, and its successful implementation in the company, is by definition always dependent on the value it generates in a society. This is a central aspect of innovation itself, which should be given appropriate consideration. Normative aspects can be identified as to how innovations in the company can be better evaluated and holistically integrated in this context. These aspects ensure more responsible innovation in the company and include the following aspects: i) Weighing up of innovations in complex multidimensional problems and along original corporate goals and visions (goal-orientated). ii) The procurement of information and the weighing up of possible (negative) external effects of innovations. This concerns the entire organisation/ company and society (indirectly or directly affected) in which an

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[1] Cf. Zillner, S. & Krusche, B. (2012). Systemisches Innovationsmanagement. Grundlagen – Strategien – Instrumente. Stuttgart: Schäffer-Poeschel Verlag.

[2] Cf. Carbon, Faix, Kisgen, Mergenthaler, Muralter, Schwinn & Windisch (2021). Steinbeis-Innovationsstudie. Steinbeis-Edition, Berlin.

[3] Cf. Faix, W. G. (2024). Von Dampfmaschinen, Künstlicher Intelligenz und Quanten-Computing: Fluch und Segen von Innovationen. Steinbeis. Steinbeis-Stiftung, 61-73.

4 Cf. Sauve, S., Bernard, S. & Sloan, P. (2016). Environmental science., sustainable development and circular economy: Alternative concepts for trans-disciplinary research. Environmental Development, 17, 48-56.

5 Exceptions can be found here if innovations and company goals are aligned accordingly from the outset and, for example, the "green energy" market is to be developed, etc.

[6] Cf. McCraw, T.K. (2007). Prophet of innovation. Schumpeter and Creative Destruction. Cambridge: Belknap Press of Harvard University Press.

[7] The foundations for approaches in this direction can already be found in Faix, W. G., Mergenthaler, J., Ahlers, R.J. & Auer, M. (2014): Innovations-Qualität. Über den Wert des Neuen. Steinbeis-Edition.

innovation generates value. iii) The transparent handling and communication of all aspects of innovation on the part of the company (within the company itself and the society). It has been shown that this in no way runs counter to efficiency criteria in the company, but instead generates more long-term growth through sustainable value creation[8].

Technology Assessment of Wide Area Surveillance Systems for Addressing Societal Benefits and Challenges: An Empirical Study from Aerospace Company

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This study, conducted within an aerospace company, represents a qualitative inquiry into exploring the societal benefits and challenges of Wide Area Surveillance (WAS) systems in Türkiye through the lens of technology assessment (TA). The overarching goal is to address societal benefits and challenges associated with WAS systems while enhancing responsible WAS development in Türkiye. By exploring technological, political, social, ethical, environmental, and legal aspects, the study seeks to contribute to the development and implementation of WAS technologies, thus aligning with the broader attention for responsible innovation within firms and economic ecosystems.

At the heart of this study lies an exploration of the intricate tapestry of societal benefits and challenges woven by the integration of WAS technologies into the Turkish context. While these systems bear the potential for enhanced public safety, improved emergency response, and strengthened security measures, they concurrently raise profound social concerns. Privacy considerations stemming from constant monitoring, ethical dilemmas related to potential discrimination and misuse, cyber security vulnerabilities, and legal and regulatory uncertainties constitute critical facets of the societal landscape shaped by WAS systems. Within this overarching context, the study endeavors to address the following research question: What are the social benefits and challenges of WAS systems, and how can aerospace companies contribute to addressing these issues, considering the implications for technology and innovation policies and regulations governing the development and use of WAS technologies? In accordance with the underpinning research framework it employs, the main research question is divided into three components through the lens of technology assessment (TA) and responsible research and innovation (RRI) orientation.

To navigate these inquiries, our methodology employs a qualitative approach, specifically a focus group workshop, engaging participants from various departments within an aerospace company. Through participatory TA, the study seeks to unravel industry stakeholders' perceptions, insights, and recommendations, fostering stakeholder engagement. The findings reveal that WAS systems offer diverse societal benefits, including enhanced public safety, improved emergency response, and infrastructure security, but also pose challenges such as privacy concerns, ethical considerations, and the need for clear legal frameworks, emphasizing the importance of a comprehensive and balanced approach in

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[8] This can also be illustrated for companies whose corporate objectives indirectly include such processes, as is the case with AMRO Real Bank, for example.

their development and deployment. The findings of the study are expounded upon in the theoretical and practical implications of the discussion.

The aerospace industry emerges as a key player in navigating these challenges, with recommendations urging active participation in policy formulation, ethical guideline development, and collaboration with regulatory bodies. The emphasis on data security, diversification of product applications, and engagement with relevant governmental bodies aligns with corporate social responsibility principles.

As the findings are integrated into technology and innovation policies, the study advocates for a comprehensive and balanced approach that considers both the advantages and challenges associated with WAS technologies. Aligning with the existing literature, the conclusion reinforces the need for informed policy-making, prioritization of ethical and legal principles, and tailored technology development to address specific use cases.

This study contributes to the ongoing dialogue on the responsible development of WAS systems, offering a foundation for future research endeavors and guiding policymakers, industries, and stakeholders toward a more balanced and ethical integration of surveillance technologies in Türkiye's societal landscape.

The role of stakeholder participation in unlocking innovation in cross border health ecosystems

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As the healthcare landscape evolves, companies and organizations are increasingly seeking market insights from neighbouring countries to navigate the complexities within the health and care sector. By scaling innovations across borders, they can obtain a broader market for innovative solutions. This presentation shows the potential of cross-border innovation scaling, emphasizing the pivotal role of end user and stakeholder involvement in shaping firms' strategies, operations, and broader societal impacts. Living labs emerge as instrumental contributors to this process, by unveiling cross-border market insights, enhanced user acceptance and experience, enriched end-user insights and better productmarket fit. A critical link to Responsible Innovation is integrated, as ethical considerations and societal responsibility is inherent to this approach.

Demographic and health challenges are often similar in most European countries. Most countries are confronted with an increased demand for care and the 'Silver Economy', projecting substantial growth in health, care, and technology poses both challenges and opportunities. Innovative solutions can provide (partial) answers to the challenges of this changing landscape. However, the financial risks associated with product development and the need for a sizable market pose sustainability concerns. The creation of new European ecosystems, uniting neighbouring regions and stakeholders address shared challenges.

The presentation shares insights gained from various cross border collaborations gained within the health living lab LiCalab over the past 10 years. Living labs involve multiple stakeholders, including end users, in the exploration, cocreation, and evaluation of innovations within realistic settings. They guide developers in creating and testing new care

concepts, services, processes, and products, placing end users at the forefront of innovation evaluation and development and thus have a huge potential to support organizations in developing and launching products for the international health market.

Experiences from EU-funded projects executed in different European countries between 2016 and 2023 illustrate the tangible benefits of cross-border collaboration. In these projects, living labs, such as LiCalab, provide tailored cross-border services, including co-creation, testing, validation, and internationalization support for SMEs. This presentation serves as a testament to the significant potential of stakeholder participation and cross-border collaboration in contributing to firm practices and strategies and to foster sustainable health ecosystems.

Green innovation systems, stakeholder participation and public technologies: Explaining business responses to marine pollution in costal Norway, 1960s-1990s

Håvard Brede Aven, HVL, Sogndal, Norway

How have stakeholder's participation contributed to firms' innovation processes, and what kinds of actors have orchestrated such involvement in corporate innovation?

Taking such questions from the literature on responsible innovation and innovation systems as its point of departure, this paper explores the issue of stakeholder participation in firms' innovation processes by means of empirical case studies from business history and environmental history. Specifically, it investigates how Norwegian electrochemical and metallurgical companies reacted to critiques of marine pollution from the late 1960s to the early 1990s and seeks to explain the subsequent measures taken to reduce industrial pollution of Norwegian fjords and coastal waters.

In order to explain the extensive pollution reduction in similar Swedish industries, business historians (Söderholm et al 2022; Bergquist & Söderholm 2011) have recently pointed to the combination of a trust-based bargaining system and concomitant pragmatic environmental licensing practices on the one hand, and the establishment of new research institutes by industrial companies and business associations on the other. By facilitating close cooperation between firms, researchers, and government, this green innovation system produced a number of new pollution-reducing – and profitable – technologies. As a consensus-oriented political system with compromise-seeking public advisory committees (e.g., Hesstvedt 2020), extensive industry representation in environmental governing bodies (Asdal 2015) and several industrial research institutes, one would expect these findings to apply to the Norwegian case as well.

While this paper does find notable similarities with the Swedish case, it argues that one must also pay attention to the involvement of other stakeholders in order to understand green innovation processes in firms. As Uekötter (2009) has indicated in studies of German and American air pollution control, for instance, trust-based cooperation between regulators and businesses often required the threat of less congenial alternatives. The paper therefore also explores why businesses would want to participate in trust-based environmental bargaining systems in the first place, and why companies in some cases even went "beyond compliance" (Rome 2020) with environmental regulations. Drawing on notions of public technologies (Trischler and Bud 2018) and "technologies of humility" (Jasanoff), the paper

highlights 1) the involvement of a diverse set of stakeholders – environmentalists, ornithologists, fishermen, farmers, labor unions, municipal governments – in technological decision-making, 2) managers' and shareholders' interpretations and anticipations of public opinion, and 3) bourgeoning visions of alternative industrial uses of the fjords, in particular aquaculture.

Track 4 – Breaking the silence. Historical and cross-cultural perspectives on whistleblowing and responsible innovation of organizational transparency

(Kristian Alm, BI, Oslo, Norway; Heidi Karlsen, BI, Oslo, Norway)

Wednesday 28th 13:30-15:30 – Session 1 – Chair: Heidi Carlsen

Wednesday 28th 17:00-18:15 – Session 2 – Chair: Kristian Alm

Session 1

Chair: Heidi Karlsen, Norwegian Business School (BI), Oslo, Norway

Abstracts

The whistleblowing institute and its importance for responsible innovation in Brazil

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The present study seeks to understand whether there is a relationship, and if so, what it is, between the Whistleblowing institute in Brazil and responsible innovation. To fulfill this objective, the study will test the hypothesis that this institute is highly relevant for responsible innovation, as it proves to be a crucial practice for preventing and combating unlawful conduct in the environment of innovative processes and the development of new marketable products. Additionally, it reinforces ethical values in both the public and private sectors and, ultimately, serves as a significant instrument for the realization of democratic values. To make the analysis possible, a national and international literature review on the topics and Brazilian legislation will be adopted.

The definition of whistleblowing is found in various sources, both in academia and in treaties and publications of international organizations. For this work, we will adopt the definition provided by Peter Jubb, who understands whistleblowing as "[...] a deliberate

non-obligatory act of disclosure, which gets onto public record and is made by a person who has or had privileged access to data or information of an organization, about nontrivial illegality or other wrongdoing w hether actual, suspected or anticipated which implicates and is under the control of that organization, to an external entity having potential to rectify the wrongdoing." (JUBB, 1999). Furthermore, the fact that the whistleblower has no involvement in the unlawful action adds to this (RUIVO & PIRES, 2020).

Brazil, albeit in a modest manner and not resembling foreign legislation, has introduced the figure of the whistleblower into its legal system. First and foremost is Law nº 12.846 of 2013, which encourages the establishment of reporting channels in private organizations, although without a mandatory character, as, for example, the European Union has implemented. In public companies, due to Law nº 13.303 of 2016, these channels are mandatory. However, the most noteworthy is Law nº 13.608 of 2018, subsequently amended by Law nº 13.964 of 2019. Together, these laws establish the tripod that encourages, albeit not in the manner the international community expected, the act of whistleblowing, including (i) the creation of reporting channels, (ii) secrecy and protection, and (iii) rewards for the whistleblower (ROCHA, 2021).

Just like the definition of whistleblowing, the concept of Responsible Innovation has various proposals. However, for this work, we will adopt the concept of R. von Schomberg, who understands it as "[...] 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 (in order to allow a proper embedding of scientific and technological advances in our society)." (VON SCHOMBERG, 2011)

Furthermore, in conjunction with this concept, we will add the four dimensions of responsible innovation proposed by Jack Stilgoe, Richard Owen, Phil Macnaghten. These four dimensions, according to the mentioned authors, are anticipation, reflexivity, inclusion, and responsiveness. In this context, the study will seek to understand if there is a relationship, and if so, what it is, between the whistleblowing institute and responsible innovation in Brazil. To achieve this, topics such as (i) the concept and historical perspective of the whistleblowing institute in Brazil, (ii) responsible innovation in Brazil, and (iii) the role of whistleblowers within responsible innovation will be explored in depth.

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Contemporary challenges in corporate communication in Brazil: Whistleblowing and its (non) correlation with Ethics Councils

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Regarding the topic "whistleblowing and organizational transparency promoting innovation", the concept has grown in Brazil that whistleblowing, as a disruptive tool, is not applied effectively if it is not accompanied by innovative instruments within business organizations, instruments that generate significant changes in the business culture itself. On this topic, as something allied to whistleblowing, there is a need to create and implement so-called Ethics Committees. Based on this hypothesis, this paper intends to develop, in addition to its importance, how Ethics Councils should be implemented in practice, an activity that goes through a series of stages such as 1) defining the objectives and responsibilities of the committee, 2) the selection of qualified members and what would be the appropriate parameters for their assessment, 3) the establishment of a governance structure capable of resisting contemporary challenges, and; 4) the development of an efficient code of ethics compatible with the area of business activity, documents that must contain a multidisciplinary vision. Furthermore, the article aims to reflect on the notion of organizational violence from the critical perspective of peace studies (Peace Studies), especially the discussion around Johan Galtung's typologies of violence in light of the principles that guide conduct ethical and responsible organizations in private, public and

third sector organizations. The main results were presented the bases on the mechanisms of legitimization of organizational violence based on some descriptive examples, questioning practices that naturalize such violence. In addition to establishing a schedule, concrete examples will be presented involving good practices on the part of Ethics Councils of national companies involving 1) Continuous training, 2) Effective reporting channel 3) Monitoring and auditing, 4) Clear and transparent communication, and; 5) Monitoring and evaluation.

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Employee Dissenting Voice, Communication Climate and Risk Management: A Communication Perspective on Whistleblowing in the Workplace

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Keywords: employee voice, employee dissent, whistleblowing, communication climate, workplace innovation, organizational transparency, risk management

Whistleblowing has been defined as "the disclosure by organizational members (former or current) of illegal, immoral or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action" (Near, Miceli, 1985: 4). This and various similar definitions in the literature make it clear that whistleblowing is an act of communication, a form of employee voice and especially of dissenting voice, touching on

aspects such as freedom of expression, organizational resistance, and ethical dilemmas (Mazzei, Ravazzani, 2020).

Additionally, the communication climate and internal communication practises help maintain or hinder a culture of transparency and accountability in the workplace, which ultimately impacts whether employees feel comfortable speaking out about company misconduct without fear of retaliation, and whether they do so internally or externally (Mannion, Davies, 2015; Miceli et al., 2008). An effective approach to whistleblowing is to foster a communication climate in which openly addressing critical issues isthe standard. When organisations are able to cultivate a climate of friendly friction, dissent, and psychological safety, individuals are more likely to proactively challenge each other at an early stage (Kvalnes, 2023; Tiitinen, 2020) and engage in constructive problem-solving internally. The same existence and functioning of whistleblowing reporting systems are commonly spread in the workplace through internal communication initiatives aimed at raising awareness among employees about the mechanisms for exposing corporate wrongdoing and promoting accountability and ethical decision-making (Mrowiec, 2022).

Although whistleblowing and communication are clearly intertwined, whistleblowing is still underresearched in the communication and public relations discipline (Greenwood, 2022). This conference contribution aimsto address this research deficit by examining whistleblowing from a communication perspective, thereby also fulfilling the conference call to engage in interdisciplinary discussions. A (re)conceptualisation of whistleblowing along the continuum of voice-silence (Morrison, 2023) is proposed. The aim is to create a conceptual framework that describes the relevant antecedents (Mrowiec, 2022), which include communication climate, leadership style, voice and ethical climate, training and education that can lead to responsible innovation in the workplace. In addition, the communicative expressions of whistleblowing are explored, including displaced dissent outside the workplace, e.g. via social or news media, as well as the communicative outcomes, including the impact on the organisation's reputation (Zeng et al., 2020) and the implications for the organisation's risk management.

Considering all this, we maintain that dissenting voices can act as a catalyst for promoting responsible innovation by creating an internal environment that raises ethical awareness, exposes shortcomings, and motivates organisations to adopt a responsible and transparent approach. From a management perspective, this approach also helps to mitigate potential risks and negative consequences in relation to external stakeholders in the context of displaced dissent. It builds on risk and crisis prevention and management, whereby effective communication and early reporting of concerns can help prevent and manage issues, especially before they escalate beyond the organisation's control and become public challenges (Ma et al., 2023).

Implications for future research and practise are derived from the proposed framework, with a focus on the aspects of organisational transparency, open communication culture, dialogue and innovation in the workplace.

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How does whistleblowing legislation reconcile the right to freedom of expression with the right to manage: some lessons from Norway.

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As the first Nordic country, Norway introduced measures to protect employees who report wrongdoing in the workplace in 2007. The new regulations were implemented in the Working Environment Act (WEA). The law-making process involved a mobilisation of interests around two camps – managerial prerogative and loyalty on the one side, and voice

and whistleblowing on the other side. The regulations have through these years continued to be contested and have been changed several times from 2007 to 2021.

Our research shows that, despite more protective legislation, the risk of retaliation against whistleblowers has increased. Furthermore, whistleblowing appears less effective. Management and owners can have legitimate or illegitimate interests in suppressing or supporting the disclosure of information about wrongdoing. At the same time, such information can also be of vital importance for the workplace, the workers involved, customers or users and society at large. We argue that the negative development when it comes to retaliation and effectiveness is connected to the fact that a large proportion of the whistleblowing cases fall under the definition of psychosocial work environment factors. These disclosures can be perceived as especially damaging for the legitimacy and reputation of the employers, since they represent criticism of the management's ability to comply with the employees' right to a fully adequate working environment (cf. Section 1-1 in the WEA).

Inspired by institutional theory (Mahoney & Thelen, 2012) and the Power Resource Theory (Korpi, 1978) we discuss how this negative development may be seen in light of the employers' mobilisation of interests and power during the legislative process.

Rules protecting whistleblowing can be regarded as expanding workplace democracy and voice. This limits the right to manage which, in turn, in the private sector can be seen as reducing property rights, albeit indirectly (Engelstad 2015:43). The law was implemented, and employers did thus loose the battle, but they seem to have adapted their strategies in the wake of the new legislation. It has become important to claim power over the definition of wrongdoing, especially when wrongdoing is related to the psychosocial work environment. Both the opposition against the whistleblowing protection and the mobilisation of power that psychosocial work environment factors seem to trigger, are seen as important factors to understand the lack of a positive development.

This raises two questions. First: Did the antagonism that accompanied the preparation of the legal bill cause a deficient institutionalisation of the whistleblowing provisions at the workplace level? If this is the case: Is the effect of this deficient institutionalisation made manifest in whistleblowing cases related to psychosocial work environment factors? These questions are discussed based on analyses of consultation responses from the employers' associations and the trade unions during the preparation of the legal bill in 2004, as well as empirical studies of whistleblowing and associated processes in Norwegian working life in the period from 2010 to 2022.

Our approach applies the standard definition of whistleblowing, as formulated by Near and Miceli: 'the disclosure by organization members (former or current) of illegal, immoral or illegitimate practices under the control of their employers to persons or organizations that may be able to effect action' (Near and Miceli 1985, p. 4). The definition includes internal and external whistleblowing.

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The Journey of Whistleblowing in Norway: From Precursors and Emergence to Established Practice

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This presentation introduces our upcoming monograph, a pioneering exploration into the history of the concept and practice of whistleblowing in Norwegian work life from 1970 to 2007. As the first of its kind, our work fills a significant research gap, utilising extensive data compiled through the AFINO project.

The concept of whistleblowing was not yet coined in the Norwegian language in the 1970s. However, there were examples of whistleblowing in the Norwegian context during this decade. The conditions for, and the discourse on, whistleblowing underwent significant transitions from the 1970s leading up to the establishment of whistleblowing provisions in the Norwegian Working Environment Act in 2007. One key change observed is a redefinition in the perception of whistleblowers: from being viewed as 'disloyal' to their workplaces, to being recognised as loyal to both a higher ethical standard and, ultimately, to their workplaces themselves when whistleblowing is justified. This transition is contextualised within broader sociopolitical movements, analysing the influence of leftist activism and liberalconservative principles. Key historical figures and pivotal cases are examined.

We conduct a Michel Foucault-inspired discourse and concept analysis. This involves identifying the constitution and validity fields of the concept of whistleblowing. We identify both scientific and non-academic disciplines or environments where the concept is constituted, as well as the rules for its use in these fields. Furthermore, we investigate the problems, contemporary needs, and strategies for solutions that the concept enables or contributes to articulating, as well as the interests it serves. Next, we trace the history of these problems and the forces and contradictions they are part of. Finally, we examine how the concept delineates one practice from other practices during the period and the function of this delineation.

The mass digitisation efforts of The Norwegian National Library have been crucial for our work. Through keyword searches in books, newspapers, and journals in the Digital Library, as well as n-gram, concordance, and collocation analyses via The Norwegian National Library's research API, we have mapped out a large part of the material underpinning the discourse and concept analysis of the emergence and development of whistleblowing and the concept of whistleblowing in Norway. This monograph not only charts the historical course of whistleblowing in Norway but also connects it to global trends, providing insights

into the complexities and nuances of whistleblowing as a critical practice in modern differentiated societies. This presentation discusses these broader global trends.

Session 2

Chair: <u>Kristian Alm</u>, Norwegian Business School (BI), Oslo, Norway

Abstracts

Defining whistleblowing in context: a French case study

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Ongoing debates about definitions and terminology are a feature of many fields, but in whistleblowing research the definition offered by Near & Miceli (1985) at a very early stage in the development of the field ('disclosure by organization members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action') quickly became and remains widely accepted. This reflects the broad but precise nature of the definition itself, but also implies that scholars assume whistleblowing is a universal and constant phenomenon (i.e. essentially the same in all places and at all times). In this paper we explore the limitations of grounding whistleblowing research within this implicit general model. We argue that what whistleblowing means to lay people is influenced by environment, context and culture. Taking the case of France as an example, we examine the unique cultural, legal, and historical features that shape the French understanding of whistleblowing, illustrated by data from a study of workers within French international development charities. We suggest future research should consider the dynamic aspects of a working definition of whistleblowing to gain a better understanding of the needs of whistleblowers.

Runaway Trains and Persecuted Whistleblowers: The Consequences of Innovation without an Effective Regulator

Ian Garrett Bron, Toronto Metropolitan University Centre for Free Expression, Toronto, Canada

This paper examines the importance of whistleblowing in preventing innovation from being used as an excuse for dangerous shortcuts in manufacturing or other processes. Canada's experience in the delegation of regulatory enforcement of safety in the transportation industry serves as an example. Starting in the 1990s, industry actors in aviation and marine transportation began advocating for greater freedoms in meeting safety and security standards. The regulatory framework at the time was prescriptive, requiring operators to meet strict requirements. Inspectors walked the rails, patrolled the airports, and entered facilities to ensure minimum requirements were being met. This was regarded as expensive and inefficient by industry, which advocated for a shift to performance-based regulation –

one which sets standards but gives operators the freedom to determine the manner in which they are accomplished.

The government of Canada embraced this proposal, in part because of anticipated cost savings. This led to the adoption of Safety Management Systems (SMS). Under SMS, the responsible ministry, Transport Canada, shifted its role from inspector to auditor, in theory ensuring that the SMS developed by operators was in place. As error and misconduct are inevitable in human endeavours, and to replace the close oversight of government inspectors, SMS systems must be able to identify, report, and correct defects, errors, and misconduct. When fully integrated into the culture of an organization, this may be the result of a speak-up culture. Where it is not, it may require whistleblowing. Indeed, under SMS, whistleblowers become crucial to informing the public of the risks and dangers. For insiders to be willing to step up, however, research suggests that they should first be convinced that they will be protected and that the wrongdoing will be corrected.

Then, in 2013, a freight train carrying crude oil derailed and exploded in the town Lac Mégantic, Quebec. Forty-seven people died. In 2015, an Air Canada flight made a "hard landing" in Halifax – the aircraft was destroyed, but no lives were lost. Similar incidences in different fields such as food safety show that the problem was not isolated. Inadequate whistleblower protection both in industry and within the regulator was identified as a key cause of the disasters. Subsequent investigations and studies revealed that industry actors were indeed using the excuse of innovation to cut corners in their safety processes, and had ignored or attacked whistleblowers within their organizations. Worse still, whistleblowers within government were also being silenced when they attempted to raise concerns.

Studying this and other cases through the lens of historical and rational choice institutional theories suggests that they arose in large part because long-standing internal institutional government norms, structures, processes, and incentives were at odds with whistleblowing. More specifically, key assumptions in the logic of existing whistleblowing mechanisms in Canadian government are not met. This gave industry actors the freedom to make dangerous changes, unchallenged even when government personnel attempted to raise the alarm. Industry whistleblowers were viewed with the same suspicion. Unfortunately, it does not appear that these disasters have led to any changes: In the wake of the Lac Mégantic tragedy, the government's priority was preserving its reputation. No lasting changes were made to law or practice. This experience serves as a cautionary tale in the hazards of uncritically accepting industry promises on the merits of innovation in crucial areas such as safety and health.

Understanding whistleblowing in developing countries: A case of whistleblower protection policies in Africa

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Whistleblowing, the act of an employee speaking up against ethical failures either internally or externally to persons who can affect action (Near & Micelli, 1985) is not a new concept.

Research (Andrade, 2016; Culiberg & Mihelic, 2017; Vandekerkchove & Lewis, 2011) on whistleblowing has interrogated its drivers and disenablers, including the influence of the institutional environment. In developed economies, with century-old democracies and relatively more mature legal institutions, laws to support whistleblowing have been in existence for decades and over the years these regulations have evolved to ensure that public and private sector organisations enable employees to speak up against illegal and immoral actions (Onyango 2021).

Contrary to developed economies, African nations have only experienced political independence since the 1950s and 1960s undergoing significant periods of undemocratic military rule in the succeeding three decades, and only returning to sustained democratic dispensations in the 1990s (Rothchild & Gyimah-Boadi, 1981: Meredith, 2005). This new democratic era led to heightened expectations of transparency and accountability in both the public and private sectors (Yeboah-Assiamah et al., 2016; Meredith, 2005). The introduction of the African Peer Review Mechanism, an instrument for members of the African Union to voluntarily accede to an African self-monitoring mechanism suggests commitment to improving transparency and accountability. These initiatives inspired some African countries to develop whistleblowing and anti-corruption policies, with others going a step further to pass whistleblowing legislation. Nevertheless, whistleblower protection laws vary in quality and effectiveness (Domfeh & Bawole, 2011). Despite these developments existing literature has not sufficiently interrogated whistleblower legislation on the continent. In our study we evaluate the legal instruments and their implementation in African countries.

Whistleblower protection laws are necessary to enable a culture of speaking up against ethical failures, as they provide legal and institutional mechanisms to safeguard citizens and employees who choose to disclose misconduct. Even though all African nations but Eritrea are signed onto the United Nations Convention against corruption (UNCAC) which requires that states protect whistleblowers according to their domestic legislation, only seven African countries have explicit domestic legislation to protect whistleblowers from retaliation, harassment and discrimination. In some cases, despite the whistleblower protection laws, whistleblowers are still not protected. A case in point is in South Africa, where the Protected Disclosures Act (PDA) 26 of 2000 has largely failed in its protection of whistleblowers. The recent killing of the Chief Financial Officer of the Gauteng Provincial Health Department, Babita Deokaran, who blew the whistle against the Covid PPE procurement scandal in the health system brings to the fore the question of the effectiveness of whistleblowing protection laws in weak institutional environments.

A detailed examination of whistleblowing legislation (or the lack thereof) in Africa and related strengths and weaknesses is necessary for a nuanced understanding of the research on whistleblowing. Our comparative analysis seeks to contribute to the research on whistleblowing by identifying aspects of the genealogy and functioning of whistleblowing legislation.

Our research explores the legal and institutional context for whistleblowing in Africa. We seek to understand the clarity, precision, and articulation of whistleblower protection laws in Africa, cognisant of the levels of democratic independence and maturity across the continent. We also explore how institutional dynamics influence the formulation and implementation of whistleblower protection laws.

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Track 5 - Are inter- and trans-disciplinarity living up to their promise in RRI?

(Harald Throne-Holst, OsloMet, Matthias Kaiser, UiB, Christian Wittrock, OsloMet)

Friday 30th 8:30-10:30 – Session 1 – Chair: Harald Throne-Holst

Friday 30th 13:20-15:00 – Session 2 – Chair: Harald Throne-Holst

Session 1

Chair: Harald Throne-Holst, OsloMet, Norway.

Abstracts

Across disciplines, to make an impact. The technological impact of boundary-spanning research projects

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[1] University of Bologna, Italy

For over three decades, management studies have been investigating the consequences of spanning boundaries in different fields, such as strategy and finance, innovation, entrepreneurship. In the field of science, scholars have analyzed the dynamics of boundary spanning research from different perspectives, mostly at the individual level and by looking at the consequences in terms of generation of scientific impact (e.g. Leahey et al., 2016; Yegros-Yegros et al., 2015). If these studies have increased our understanding of how the combination of knowledge among different fields may play an important role, they mainly disregarded two elements: (i) the assessment of boundary spanning at the level of research projects, rather than at the individual level, and (ii) the link between boundary spanning scientific activity and technological impact, rather than scientific impact.

In this paper, we address these gaps by focusing on the boundary spanning nature of research projects (Boudreau et al., 2016; Criscuolo et al., 2016) that we define as researchers' ability to access and flexibly integrate different sources of knowledge which derives from outside the boundaries of their own disciplinary field. With this definition in mind, we intend to answer the following research questions: Are boundary spanning research projects more likely sources of technological impact? And, how does such relation is moderated by the academic seniority of the scientists leading the research projects?

This investigation is relevant for the following reasons. First, literature suggests that the process of scientific research is increasingly becoming the output of a team activity within projects (Paruchuri, 2010). Second, the interrelation between science and industry is recognized as crucial for increasing innovative performance, accelerating growth and supporting competitiveness of organizations and countries (Dumont, 2017; Jaffe, 1989). Third, there is an open 2 debate on the role of academic seniority in innovation and technology transfer processes, on the one hand, and in the adoption of boundary-spanning research, on the other hand (Haeussler and Colyvas, 2011; Munari and Toschi, 2021).

We investigate our research questions exploring the scientific outcomes from 6,081 projects in Life Sciences, Physical & Engineering, and Social Sciences & Humanities funded by the European Research Council (ERC), the premier funding agency for frontier research in Europe, under the FP7 and H2020 programmes for the period 2008-2016. We identify the patents that relied on the knowledge produced by these projects and investigate to which extent boundary spanning projects are related to technology development. We measure boundary spanning using the diversity of subject areas (identified on the SCOPUS database) represented by the backward citations of the publications derived by each ERC-funded project. We assess technological impact in terms of i) a boundary-spanning research project's probability of having its scientific publications cited by at least one subsequent patent and ii) a boundary-spanning research project's ability to inspire patents that span across broad technological domains. In this paper, we are thus interested in tracing knowledge flows from science to technology.

Results from our regression analyses show that the relationship between boundary spanning and technological impact is not linear. Boundary spanning research projects are more likely to generate technological impact but there is a turn point where the increment on the knowledge range starts to hinder technological impact. Moreover, our results show that the researchers' academic seniority moderates the relationship. In particular, we find that for

mediumlow levels of boundary-spanning, when the scientific projects are led by junior researchers, the inverted U-shaped relationship is more pronounced.

Who is the "we" in "The science we need for the ocean we want"?

Mimi Elizabeth Lam, University of Bergen, Norway

The UN Ocean Decade´s slogan is "The science we need for the ocean we want." But who is this "we"? And is it the same "we" in the "science we need" as in the "oceans we want"? These questions define the crucible of Responsible Research and Innovation in the global ocean context. To assess if research is responsible, it is necessary first to answer the question of responsible to whom and then, responsible for what? The writers of the slogan likely intended scientists to determine "the science we need," that is, scientists are the first "we". But they likely intended the second "we" in "the ocean we want" to be civil society.

The first problem, which is indeed a wicked problem, is for scientists to agree on "the science we need": this is fraught with challenges. Scientists from varied disciplines rarely communicate with each other, and if they do, they rarely agree, as the facts of interest, the methodological tools of investigation, and even, and most perniciously, the conceptual frameworks of structuring information and assessing merit can vary with discipline. So "we" (there is that unassuming, but obtrusive two-letter word again!) must then ask which scientists should be tasked or elevated (depending on one´s perspective of work to be done or power to be exercised or gained) to define "the science we need"? Should it be the oceanographers, since we are dealing with the oceans? Or the ecologists, if we are concerned also with the creatures living within the oceans? Or the social scientists (e.g., the anthropologists, sociologists, and geographers) that study people and their interactions with the oceans? Or the meta-scientists (e.g., the historians, philosophers, and ethicists) that are concerned with the norms and biases within and about science? Or should it be all? But then how do "we" foster agreement? What criteria are to be used? And who decides? Should it be the elites, and if so, which elites, the most rich, published, awarded, or popular? How do we reconcile this diversity among humans? There is that wicked "we" again. It is unavoidable!

The second problem - of "the ocean we want" - is even wickeder, as more diversity exists within society than within the enterprise (or bubble) of science. Here, should the decision be made by majority vote, consensus, or (rich, political, intellectual, or otherwise powerful) elites within society? How do we ensure that the process will be fair, representative, and transparent and that those making the decisions will be (well-)informed. It can be next to impossible to agree on the movie "we" want to watch, let alone the ocean "we" want!

So how do we solve these wicked and wickeder problems? My answer: transdisciplinarity! But this only opens up new questions, such as how to elicit the preferences of the "we" and how to reconcile diverse preferences, knowledge sources, and values of this "we." In this talk, we – nay, I – will present the results of our efforts within the Managing Ethical Norwegian Seascapes Activities (MENSA) project, funded by the Research Council of Norway, both to elicit and to reconcile the diverse values and identities of Norwegians at the individual, community, and national levels with respect to ocean management and governance.

Students as agents of innovation and radical transformation of academia through design thinking

Simona Brozmanová[1], Alex Taylor[1], and Haizea Perez Machin[1]
[1] OsloMet, Norway

This project at Oslo Metropolitan University, explores the importance of students as agents of innovation and radical transformation within the academic realm through the application of systemic design thinking principles. The initiative addresses the pressing need for academia to undergo transformative change to become more relevant and responsive to societal challenges. It proposes that students, with their fresh perspectives and firsthand experience of the world's current issues, are uniquely positioned to drive this transformation. Their interest in change and the energy they bring are identified as critical components in generating innovative ideas and facilitating action.

The research underlines the limitations imposed by current academic structures on creative thinking and proposes the reevaluation of the traditional separations between research and student engagement. It advocates for a systemic rethinking of how academia interacts with its students, aiming to foster a more integrated and collaborative environment. The utilisation of systemic design and design thinking emerges as a fundamental approach to achieving this goal. These disciplines offer methodologies for action and intervention that not only encourage creativity within academic settings but also promote inter- and transdisciplinarity as essential for addressing complex societal issues.

The project highlights examples from the SPARC (Sustainable Partnerships and Research Collaborations), a student-driven pilot project conducted in 2023, showcasing the successful application of design disciplines in various structural sectors of educational institutions. These examples illustrate design's potential to facilitate and require a shift towards more interdisciplinary and transdisciplinary approaches in academia.

Furthermore, the paper engages with the broader discourse on 'Transforming higher education for global sustainability.' as championed by UNESCO (UNESCO, 2022). Case studies appear to be a good approach when tailoring the innovation principles to the institution. Additionally, the complexity of "wicked problems" can be tackled through enhanced collaborative efforts across different knowledge systems and power structures. It critiques existing models of knowledge exchange within Responsible Research and Innovation (RRI), advocating for a model that better supports student-led initiatives and cross-level collaboration.

This exploration into the transformative potential of design thinking within academia contributes to the discourse on systemic design principles in social innovation, emphasising the importance of acknowledging interrelated problems, developing system-wide empathy, strengthening human connections to foster creativity, influencing mental models for change, and adopting an evolutionary approach to systemic change. Through this lens, the project offers a compelling argument for reimagining the role of students in academic innovation and societal transformation, encouraging a new form of inter- and transdisciplinarity.

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Fostering user involvement in collaborative innovation spaces: insights from living labs

Judy Hong Huang, University of Stavanger, Norway

The evidence of users' innovation ability can be traced back centuries (Bogers et al., 2010). Still, it was not until the 1970s that von Hippel (1976) showed users' innovation capability, from recognizing potential needs to developing and diffusing solutions. From giving inputs to product development to being the source and the center of innovation, users' roles are shifting, and a more active group of them are even innovating the rightfitting solutions for themselves and society at large (von Hippel, 1988, 2005, 2016). Users participate in every phase of the innovation process, from idea generation, conception, and testing to diffusion (Bosch-Sijtsema & Bosch, 2015). A close look reveals that they have different roles and degrees of engagement in the process and, therefore, a spectrum of user involvement (Almirall et al., 2012). Given that users are often spread out, it is imperative to explore the avenues where they can engage in innovation. Firms and organizations actively seek out users to foster value exchange and co-creation (Ballon et al., 2018). Innovators and researchers have explored diverse ways of engaging users within innovation spaces to stimulate knowledge exchange and value creation (Caccamo, 2020). These collaborative innovation spaces, known by various names such as fab labs, open labs, living labs, and studios, bring together actors across different boundaries of domains to develop innovative solutions collaboratively (Fritzsche, 2018).

Since the 2000s, the living lab has emerged as a popular environment and platform for fostering innovation with users due to its openness, real-life context, and user-centric approaches (Leminen & Westerlund, 2019). Living labs facilitate activities around users, capturing tactic knowledge to develop solutions that fulfill their needs (Almirall et al., 2012; Leminen et al., 2017), and contribute to addressing complex technological and societal issues such as sustainability, education, health, and well-being (Hossain et al., 2019). While researchers have explored various aspects of this complex process, there remains a need to delve deeper into their approaches to user involvement.

This study explores the core elements influencing user involvement during the innovation process within the context of living labs. Adopting a qualitative research approach, we conducted interviews with 22 representatives from 18 living labs and the European Network of Living Labs (ENoLL), an international cluster of living labs with over 150 active members and extensive connections of non-member living labs. Through a detailed exploration of the user involvement dynamics and mapping onto emerging theories, this study presents a framework of user involvement in the innovation process and crucial factors affecting each. Our objective is to glean insights that can be used to support continuous user involvement through collaborative innovation spaces.

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The heart of the matter with Transdisciplinarity (TD)

Neeraj Mistry, University of Pretoria, Republic of South Africa

Transdisciplinarity (TD) is a form of transformative research intended to engage various disciplines to tackle complex challenges or "wicked" problems, which cannot be addressed within any single faculty alone. Furthermore, TD acknowledges the importance of an extended stakeholder group, which usually involves communities and sectors outside of the academic setting. These stakeholders include business or the private sector, non-profit organizations, local communities and civil society, governments, and international and regional agencies. The impetus behind this approach is that diversity of stakeholders and disciplines can create the enabling conditions for innovation, creativity, and transformative solutions.

A critical challenge, however, is not the rational or substantive alignment, synergies, and complementarities across stakeholders and disciplines, but the individual personality and human factors that enable or hinder collaboration and co-creation. The former, are commonly termed hard issues, which are problems that are well defined or well structured. These are routinely solved by application of a well-understood formula, process, or design. On the other hand, soft issues are "Problems that are highly dependent upon how they are perceived by the participants[9]," essentially - the heart of the matter.

This presentation will examine the nature and associations of hard and soft problems, and from a systems-thinking approach[10], look at various methodologies and approaches to specifically address soft problems. It will compare and evaluate two approaches: the corporate sector that embraced soft issues as part of their operations and strategy[11], and the non-profit sectors that are valuing employee "passion, energy, and ideas"[12]. The central argument will be based on the neglect of collaboration in academia. While it is identified as a key skill[13], there is less attention to its execution, particularly in the nuanced "soft" issue lens of understanding those factors that inhibit and promote collaboration. These factors are exaggerated with transdisciplinary work. This presentation is an exploration of examples of

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successful TD collaboration with particular attention to the soft issues as a key determinant to TD success by focusing on academic methodologies of collaboration.

Session 2

Chair: Harald Throne-Holst, OsloMet, Norway.

Abstracts

Extradisciplinarity: Incremental innovation within the disciplinary structure

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Much has been made of the potential for interdisciplinarity and transdisciplinarity to spawn innovation. But these concepts fall short of capturing the richness and variation across the many kinds of productive relationships that can exist among disciplines. Understanding interdisciplinarity to be the synthesis of knowledge between two or more fields (Klein) and transdisciplinarity to be the application of knowledge across multiple disparate fields (Scriven), we found that neither of these concepts adequately characterizes the nascent, inherently cross-disciplinary field of data science. Instead, we develop the theory of extradisciplinarity to capture what is happening on the ground in the emergent field of data science. An extradiscipline is a field that exists to facilitate the exchange of knowledge, skills, tools, and methods from an indeterminate and fluctuating set of disciplinary perspectives while conserving the boundaries of those disciplines. The idea of the extradisipline captures the way data science is conceived by relatively junior actors who are intimately involved in learning, teaching, and advancing the methods and tools that make up an emergent data science culture. These actors characterize data science as: a practice grounded in specific disciplinary applications and highly sensitive to disciplinary contexts; a relational arrangement in which data science does not exist separate and apart from scientific domains but rather emerges at their intersection through collaboration and interaction; and an adaptive pursuit that entails improvisation, customization, and exploration on the part of its practitioners. We argue that this extradisciplinary vision represents a quotidian, day-to-day reality of data science. This can be juxtaposed against a transdisciplinary vision peddled by relatively powerful boosters of data science that portrays the field, in contrasting terms, as transcendent with regard to its agnosticism for disciplinary context, appropriative in its relationship to the acquisition of data from various disciplines, and impositional in the way that the tools and methods of data science order and shape the data and questions of disciplines. Whereas the vision of data science as a transdiscipline developing paradigmatically novel methods and tools that promise to be universally impactful is a seductive one that has been successful at raising money and institutional support for this new field, the quotidian reality of data science as an extradiscipline offers a more humble and conservative view. Extradisciplinarity, instead, leads to incremental change within a stable disciplinary structure through the support of craft-like skills, collaborative practices,

and idiosyncratic problems. These findings—reported in Tanweer & Steinhoff (2024)—have implications for how we understand the evolution of a consequential new field, and for how we theorize the role of disciplinarity's many permutations in innovation and knowledge production.

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How sustainability and responsibility are integrated to the project life cycle

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It is increasingly important to consider both sustainability and responsibility in any kind of work and projects. Here I am discussing mainly research projects, but the same topics and processes may be general in all types of projects.

In research projects, we have at least three main categories to be considered: research goals or targets, research procedures and underlying principles and values. Recently, both research funders and research organizations have referred often to Sustainable Development Goals (SDGs) as a meaningful objective for any kind of study. Research projects need to consider the positive impact and contribution to the specific sustainability goals as well as identify potential negative impact at the same time. In addition, projects should build up the so-called mitigation procedures to avoid or decrease those negative effects. These SDGs should be identified in the very early phase of the planning of the project and should be monitored and validated during the project.

For a proper, authentic and useful consideration of SDGs, one should strictly follow principles (reliability, honesty, respect and accountability) of research integrity and implement the Responsible Research and Innovation (RRI) approach to the project. RRI approach emphasizes broader ethical perspective and consideration beyond the legal approach, which leads to the stronger stakeholder engagement and anticipation. Diverse stakeholders should be included in the process, which calls for specific and customized capacity building activities and the mutual learning process to enable authentic multi-stakeholder approach aiming at co-created common goals and more empowered participants. Transparency, trust, dialogue and open mind will be key factors in the process. If research project partners (including citizen scientists) respect each other, handle research environment in respectful manner and respect both social and natural environment, research partners will plan and implement research in a way that it will produce better results: results that are based on reliable research methods and process; results that will be presented honestly and partners feel accountable to their work and activities. Thus, research

integrity principles are the foundation, which also ensures the excellence and quality of the research.

To ensure that these principles, values and procedures are well integrated into the whole research process in a way that enable better contextualization of them, I here present a SEEED -model. SEEED model will guide the project to consider sustainability and responsibility from the planning phase till the end of the project and beyond. Meaningful contribution to the sustainability is the starting point for the project planning. No significant harm -principle should be guiding the project when balancing between positive and negative impacts. At this very first phase it is important already carefully consider ethical, legal and regulative issues, which may already lead to the no-go decision at this point. As said, ethical consideration goes beyond the legal approach and will add more reflective thinking from multiple perspectives to the project plan. Engagement of right and suitable partners and stakeholders is extremely important for the successful planning and implementation of the project. At this stage it is important to evaluate the sustainability risk based on country, industry and organization profile: the project requires enhancing sustainability remarkably if other risks are also considered quite high. Already in the planning phase project makes the first assessment of the evaluation methodology both in the process and product level: what kind of indicators and measure validate the project work properly. Finally, the dissemination and exploitation of the project work should be taken seriously as only a strong sharing of both good and bad experiences will accumulate the knowledge for the research community, as well as ensure that the resources will be used responsibly, also in the future.

Inter- and transdisciplinary input for establishing an Intergovernmental Panel on Food Security and Sustainability

Matthias Kaiser, University of Bergen, Norway

The world of politics and academia has learned to listen carefully to the recommendations of the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as important bodies to stimulate policy. They provide target measures for reaching goals on climate change and biodiversity which help to formulate appropriate measures of states. They also specify indicators for reaching the overall goals of the Sustainable Development framework (SDGs). The question arises, though, whether the world needs a similar effort in regard food security. The COVID-19 pandemic was the just the latest reminder how the global food system affects various other systems as for instance climate change and biodiversity. But public health, economy, social cohesion, politics, and cultural values are similarly affected. Most assessments of our food systems agree that radical changes in our food system are required if we want to reach the SDG targets. This talk presents the recommendations recently advanced by the Academia Europeae to establish an Intergovernmental Panel on Food Security and Sustainability (IPFSS) and explains why a global target of a Human Trophical Level (HTL) of 2.0 might be a way to go.

Reflections on Incorporating RRI Goals into Online Violence Prevention Research

Dante Michael Della Vella[1], Rajendra Akerkar[1], Carol Dralega[2], Torborg Igland[2]

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The global rise of violence-inducing behaviour such as hate speech in social cyberspace is a major cause of concern [NOU 2022, 2023]. This complex, multi-layered, and dangerous behaviour often channelled through mis- and disinformation has been identified as one of the leading crises of our lifetime. According to the World Economic Forum report, the hate speech crisis is projected to worsen if not addressed through transformative, responsible, and innovative research [WEF2024]. Hate speech is a crisis for the whole of society and we will have a significantly better chance of tackling this challenge if different societal actors are engaged in the co-construction of innovative solutions. Responsible Research and Innovation (RRI) means that societal actors work together during the whole research and innovation process to better align both the process and its results, with the values, needs and expectations of our society [EC, 2012].

To address hate speech, we should take a systemic, transparent and responsible approach to carefully understand how hate speech evolves, particularly in times of disasters, when disinformation triggers polarisation and discrimination towards marginalised groups. Without "responsibility by design", transparent studies, and close collaboration between public authorities, NGOs and human rights institutions, research organisations, civil society organisations, and citizens it will be exceedingly difficult to handle such online information disorder [Stahl, 2021].

To address this issue in Norway, the transdisciplinary research project – SOCYTI is developing a cloud-based, real-time detection system capable of evaluating multilingual text and images from social media posts for hateful content on a larger scale than ever previously possible. SOCYTI is an ambitious effort intended to help communities prevent the spread of hate speech online [SOCYTI, 2022]. In addition to social science, computer science, ethics, and legal analysis, the project draws on local expertise and thus strives to be transdisciplinary. The project will lead to technological solutions developed in compliance with Norwegian societal values, fundamental rights and applicable legislation, including in the area of privacy and data protection as well as ensuring explainability, accountability and promoting transparency of technological solutions that society can trust.

We believe in the importance of reaching out to stakeholders from all distinct parts of society because hate speech prevention is the responsibility of the whole society. There are different perspectives on the issue, and our work has potential utility and consequences for many kinds of people. Thus it is important that our data and results meet open science goals to be accessible to those same people. To involve non-academics in the project, we have utilised three main strategies so far: in-person workshops, surveys and interviews. All stakeholder-experiences are unique to their organisational mandate, these experiences (continue to) guide our research trajectory as they provide multi-dimensional knowledge our research seeks. The surveys are seeking informants who may have been subjected to hateful speech online or have close networks that may be vulnerable. The workshop(s) are

also arenas for promoting dialogue for building partnerships and synergies between stakeholders.

In this presentation we will reflect on the opportunities and challenges we are facing in meeting RRI goals while working on the SOCYTI project such as communicating with diverse stakeholders, sustaining community engagement, and utilising the experiences of vulnerable communities. We will further discuss how we can build on our specific experience to go beyond the existing RRI discourse in design and implementation of the SOCYTI system.

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Track 6 - CRISPR for responsible animal breeding: implications for social acceptance and animal welfare?

(Anne Ingeborg Myhr, NORCE; Bjørn K. Myskja, NTNU)

Thursday 29th 8:30-10:30 – Chair: <u>Anne Ingeborg Myhr</u>, NORCE, Tromsø, Norway

Abstracts

The responsibility of experts in the public debate about genome editing

<u>**Siri Granum Carson**</u>[1], Bjørn K. Myskja[1]
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In June 2023 the Norwegian Gene Technology Committee submitted its report "Genetic technology in a sustainable future" (NOU 2023:18) to the Norwegian Ministry of Climate and Environment. The NOU marks a milestone in a timely and necessary renewal of the Norwegian gene technology regulation and is a response to the recent technological advances within gene technology. CRISPR and other genome editing methods are more precise and less costly than previous gene modification methods, and thus more accessible for the research communities. Both in Norway and in other countries the use of new genomic techniques has become crucial tools within both basic and applied research.

The work by the Norwegian Gene Technology Committee is divided in its opinion on the need for new regulation. The majority of the committee argues for a deregulation of genome edited animals, plants and microorganism, while the minority wants a modernization of the current Act. In the EU a committee has presented a suggestion for a new Directive for genome edited plants,recommending less stringent requirement for risk assessment of plants with edited changes not involving any novel genetic material from non-crossable plants. Both the Norwegian and the European proposals has created debate among representatives from governmental agencies, research and education societies, farmers, consumer organisations, and lay people. One important question concerns what should be considered sufficient scientific evidence for the safety of genome edited products, including whether a small change in a genome in itself represents low risk. This is associated with thethe question ofsimilarity in risk between genome editing and conventional breeding. Farmers, consumer groups, other NGOs and members of the public are in addition concerned with questions related to the future of food production, about market accept and the need for ensuring consumer choice.

The majority of the Norwegian committee has engaged in a one-way public debate after submitting the report, presenting strong arguments for the importance of deregulation for Norwegian research communities and industries "to avoid lagging behind the rest of the world", "science is absolute about safety", and it is "unethical not to use genome editing". Here we aim to elaborate on the implications of this one-way dialogue and especially about the "unethical" argument. Research has shown that people's opinions about the use of new technologies include expressions of value systems, and these opinions are important contributions to how we want to organize our society around new technologies. This

research stands in opposition to the so-called «knowledge-deficit-model», where it is assumed that lay people's skepticism to new technology is primarily based in their lack of knowledge. We will argue that the public debate contributions of the majority representatives express a knowledge-deficit approach to technology communication. If the objective is to develop a broad and value-based knowledge basis for responsible regulation of genome editing, the contributions from representatives of different parts of our society as well as lay people are necessary addition to the experts' viewpoints.

Animal breeding projects anticipating who and what is at stake using an SDG-based sustainability assessment

Torill Blix, NORCE, Tromsø, Norway

Genome editing such as CRISPR allows novel development in animal breeding, including sterile or lice resistant salmon. A small tool has widened the horizon beyond previous innovations. The availability of the tool and the pace of its application stresses the need for research projects to pre-assess – anticipate, the potential effects of their proposed solution, affected parties and stakeholders, possible alternative solutions (Ravetz 1997, Stilgoe et al. 2013). In order to approach the need for research projects to assess the potential impacts of research results, I suggest using an SDG-based sustainability assessment. This assessment can be implemented as a step of anticipation in biotech projects on GE in animals. In a previous publication we have suggested a frame for a sustainability assessment framework (Blix and Myhr 2023). In this publication, we used genome-edited salmon as a case study, but the framework can be modified to other organisms and industries. Using data from stakeholder interviews and focus groups with participants from the Norwegian public and a document analysis, this framework was built on the 17 UN SDGs and Stockholm Resilience Centre Wedding cake-model. The assessment consists of 15 different topics categorized according to environment, society or economy, with respective control questions to assess the sustainability of genome-edited salmon.

Applying such a framework early in a planning process of CRISPR-projects for animal breeding can help scientist identify future challenges and stakeholders, align projects accordingly and help operationalize scientists' co-responsibility in science and innovation. According to Eberling and Langkau (2023) such SDG-based assessments have been used in various different contexts, and if all SDGs are included it is possible to achieve "holistic" assessments. This implies taking all sustainability pillars into consideration and aligning with global understanding and expectation of what sustainability is and how it is operationalized. Further, building on the assessment should thus be both available and the topics familiar to researchers. I use two different Norwegian CRISPR-projects targeting salmon breeding to show how identification of stakeholders, challenges, could actually aid the objective of the project (Güralp et al. 2020, Robinson et al. 2023). I also show how the assessment can be applied in practice through RRI activities. Finally, I return to RRI as a concept and argue that the suggested framework for sustainability assessment is actually overlapping well with several of the original "Lines of questioning on responsible innovation" suggested by Stilgoe et al. (2013), which is considered a main understanding of RRI. Conducting the assessment should thus provide the projects applying the assessment with a solid foundation for further dissemination of results and development.

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RRI in genome editing projects: Use of the Research Ethics cards to promote societal and ethical awareness

Anne Ingeborg Myhr[1], Tore Brembu[1]
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Genome editing methods as CRISPR has paved its way into agriculture and aquaculture research. Within animal and plant breeding it is expected to impact how we produce feed and food. There is genome edited plants available at the market in some countries which are nutritional enhanced, disease resistant and providing high yield. Japan has approved genome edited fishes with enhanced meat production and USA climate adapted cattle.

How to regulate genome editing is debated around the world, both in Norway and Europe has suggestions for deregulation been submitted to political decisionmakers. The use of genome editing has, especially, connected to our food systems created debates engaging scientists, food producers, consumer, and environmental organisations as well as citizens. Important issues are market access, consumers rights, risks to environment and human and animal welfare, and impacts on food production systems. Other uses of genome editing, as for production of non-food products as materials etc. have not yet played a role in the debates, possibly because these uses do not raise the same questions and aspects.

Here we will report from a project where we use genome editing in micro-algae for production of natural photonics. Current production of photonic crystals are costly and not environmentally friendly. These crystals are key components of photonic technologies facilitating light manipulation. The objective of the projects is to combine genome editing

technologies and nanophotonics to develop bio-based photonic crystals for use in biosensing and photocatalytic platforms. To foster discussions and reflection about the effects and potential impacts of the research the Research of Ethics cards has been considered to represent a usable RRI tool. The Research of Ethics cards are developed to help researchers, managers and research participants to identify, explore and reflect on their ethical responsibilities in research and innovation (Millar et al. 2022).

The Research of Ethics cards are designed to raise discussion and ask questions about a wide range of values, aspects, and assumptions underlying research and innovation, and the cards come in 14 categories that includes implications for society, environment and economy, values and principles, participants and stakeholders, as well as with regard to the research process from planning to dissemination. We will here present our experience with using these cards in technology projects, and discuss the value of using these card with regard to the overall aim of RRI in terms of its key dimensions: anticipatory, inclusive, reflective and responsive processes (Stilgoe et al. 2013; RCN, 2023). A special focus will be on how these cards can be of use in projects that aims to use new technology in projects which of nature are more based in basic research or for industrial applications beyond health and food.

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Making sense, lacking agency: Public perceptions on the use and regulation of CRISPR in agriculture in Norway

Marit Svingen, NTNU, Trondheim, Norway

This paper investigates the Norwegian public's perceptions of novel gene editing technology and shed light on how they see their own role in the governance of the technology. Since the development of CRISPR in 2012, research efforts have been put towards understanding the conditions for social acceptance and the need for governance of new forms of gene editing technology (see for instance Middelveld et al., 2023, Nawaz and Kandlikar, 2021, Nelson et al., 2021). The multitude of ethical questions and the severity of the consequences relating to this technology is thought to require a broad and democratic approach, giving members of the public a larger role to play in the governance of this technology, as: "(…) it [the human genome] belongs equally to every member of our species, and decisions about how far we should go in tinkering with it have to be accountable to humanity as a whole" (Hurlbut, Saha & Jasanoff, 2015). The technology and its potential consequences evidently need careful consideration, but regulating this is not simple: As a new and "enabling" technology, it

raises issues both because it is complex and uncertain, and because it is loaded with moral questions. Daniel Sarewitz (2015) argues that science alone cannot capture the complexity of the issues posed by CRISPR, and that the decisions that traditionally are settled scientifically, for instance by risk assessment, must be handled more democratically – by the population and with an emphasis on issues of value. Simultaneously, inclusion and upstream public engagement are a central part of the Responsible research and innovation (RRI) concept (see for instance Stilgoe et al. 2013), which implies that 'social actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society' (European Commission n.d.). This means that questions concerning the broader social and economic goals that emerging technologies should serve should be opened to wider public discussion.. As "reliable witnesses" the public as consumers are considered important producers of knowledge about the effects of the technology in the lives of "most people" (Kjeldaas et al. 2022, Funtowicz and Ravetz 1993). Thus, understanding the ways members of the public tackle gene editing technology in different ways is essential in order to regulate the technology effectively.

Against this backdrop, this paper addresses the following questions: What views on regulation and steering of gene editing technology are produced by the public themselves, and what could this mean for the regulation of CRISPR? Through qualitative interviews with members of the public the paper traces how the public makes sense of gene editing technology and the implications of its use. The merging of values, interest, knowledges, and ideologies produce distinct co-productions (Jasanoff 2004) of the technology and exemplifies the multitude of "publics" that exist. Not only do they produce different discourses on what the technology is and the implications of its use, but also give important insight into how the public view their own legitimate role in the governance of new technologies.

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Enhancing upstream engagement through understanding of Australian public attitudes about gene editing in livestock production

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The recent turn to gene editing as a potential solution to a range of animal welfare, productivity, sustainability and other issues associated with animal production processes presents significant challenges from a responsible research and innovation (RRI) perspective, particularly as applications of this technology raise important social and ethical questions. Little is known about community attitudes toward gene editing (separate from older forms of genetic modification) and its prospective use in livestock (with exception of Middelveld et al. 2022). RRI calls for upstream stakeholder and public engagement on novel technologies (Bruce & Bruce 2019), guided by the principles of anticipation, reflexivity, inclusion, and responsiveness (Stilgoe et al. 2013). This approach thus requires consideration of the broader (and often complex) socio-cultural context that informs why people think certain things about the technology. Understanding community opinions is crucial when considering how to develop proactive strategies to support engagement and alignment between different actors such as scientists, policymakers, regulators and the community with regard to whether or how a technology should be used. Despite optimism about the use of gene editing amongst the scientific community, few attempts have been made to date to engage members of the public in accordance with the RRI principles.

In this paper, we present the results of a qualitative empirical study of Australian community attitudes toward the use of gene editing in the red meat industry that aimed to develop a rich account that could inform both the science and public engagement around the development of gene editing applications. We describe our empirical research that aimed to provide a rigorous exploration of community values and viewpoints with focus on the results obtained from the use of online, asynchronous focus groups. Presentation of scenarios describing different applications of gene editing that have been developed or are likely were the centrepiece of the research allowed us to identify key questions that participants viewed as central to their conditions about the ethical acceptability of use of gene editing in sheep and cattle. Using the generic inductive qualitative analysis method, we found that participants' attitudes towards gene editing technology are closely connected to the nature and context of the proposed applications. Contrary to prior studies on related topics which report acceptability separately from perceived risks and benefits, we found that perceived risks, benefits, and acceptability were closely linked. Our study's participants assessed the application of gene editing technology according to the perceived validity of the problem it proposed to address and whether the problem was considered 'genuine' (e.g., if there was a perceived alternative solution that did not require use of gene technologies). Our findings emphasise that more upstream engagement is required to involve different publics in defining the 'problems' to be considered when exploring social and ethical

acceptability of biotechnologies, and specifically to identify what potential applications of gene editing (if any) may be acceptable for use in the livestock production sector.

Track 7 – Corporate responsibility for the 21st century

(Atle Midttun, BI, Oslo, Norway; Caroline Dale Ditlev-Simonsen, BI, Oslo, Norway)

Friday 30th 8:30-10:30 – Chair: Caroline Dale Ditlev-Simonsen & Atle Midttun, Norwegian Business School (BI), Oslo, Norway

Abstracts

Companies squeezed between autocratic and democratic regimes

Atle Midttun, Norwegian Business School (BI), Oslo, Norway

For decades, multinational companies have stepped up their efforts to embrace corporate responsibility. They have done so under the Western-led global agenda based on market liberalism and liberal-democratic values. The vision has been that globalization of markets will stimulate globalization of liberal values and that Western-style corporate responsibility will follow, energized by civic engagement and public debate.

However, the rise of China as a major economic powerhouse, in alliance with an increasingly aggressive and dictatorial Russia, has marked an authoritarian counterpoint, not only to the Western dominance of global commerce but also to Western liberal democracy and its civic-driven corporate responsibility. The global political economy has thereby become increasingly marked by a new, bipolar rivalry between democratic and autocratic states.

As the world moves towards a bipolar contestation between democratic and autocratic regimes, aggravated by the Russian war in Ukraine, the paper argues that it is time to adapt corporate responsibility (CR) to new bipolar realities. It contends that the shift from a neoliberal, Western-dominated model to a polarized globalization requires a transformation in corporate responsibility—from a heroic Western multinational championed model to a pragmatic, negotiated, and government-partnered approach.

Our research investigates CR across this divide through studies of affected companies, including analyses of new strategies to counter aggressive Russian energy policies and the corresponding Western financial sanctions.

The analysis combines a conceptual approach with explorative case studies, supplemented with a review of relevant literature.

Circular economy through industrial symbioses – a case study from M&R

Kristina Kjersem[1], Annik Fet[1]
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Based in the theoretical principles behind industrial ecology (IE), circular economy (CE) and material flow analysis (MFA), MFA can be viewed as an analytical method rooted in the field of IE and Systems Engineering (SE) (Fet and Despande, 2023). The insights from MFA further aid in building the understanding essential for establishing the principles of circularity in business practices and the resource economy. Implementing IE principles into business practice requires simple rules, such as pollution prevention and material cascading. Material cascading means that waste from one company should be regarded as a resource for another company, which considers waste minimization, resource and energy efficiency and recycling opportunities.

Furthermore, CE implies an "economic system that targets zero waste and pollution throughout materials lifecycles, from environment extraction to industrial transformation, and to final consumers, applying to all involved ecosystems. Upon its lifetime end, materials return to either an industrial process or, in case of a treated organic residual, safely back to the environment as in a natural regenerating cycle. It operates creating value at the macro, meso, and micro levels and exploits to the fullest the sustainability nested concept. Used energy sources are clean and renewable. Resources use and consumption are efficient. Government agencies and responsible consumers play an active role ensuring correct system long term operation"(Nobre & Tavares, 2021, p. 10).

Recent research in implementing circular business models brings to discussion several challenges that appear to limit a successful transition. Examples that can be mentioned include, but not reduced to, reverse logistics, legislation, and regulations, as well as easiness to identify quality and characteristics of the materials to be re-used or recovered from the tons of waste received daily by the companies in charge of waste management.

One feasible solution to eliminating waste is to develop a form for Industrial Symbioses (IS) where companies collaborate across industries and business models in eliminating any form of waste. IS is a systematic approach to create industrial networks where both economic, environmental, and social aspects are considered for the benefit of their members. Through IS, companies from all business sectors collaborate in trading materials, sharing assets to add value, reduce costs while eliminating waste. Developing IS networks is dependent on knowledge-intensive practices, where updated and viable information is necessary to identify realistic connections between flows of materials, energy, water, waste and other resources related to industrial capacities (Chatzidimitriou, Gentimis, Michalopoulos, Kokossis, & Dalamagas, 2021). In other word, IS networks enable efficient resource sharing between companies by identifying the uncaptured value of materials, and other types of waste, generating in this way new profits.

In this paper we present preliminary results from a research project on creating an IS based network that supports the implementation of circular business models across several types of industries. We also use Corporate social responsibility (CSR) as a perspective for helping ground the circular business models within the companies participating in the project.

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Sustainability Reports, Corporate Governance and Organizational Units

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Purpose: The purpose of the study is to analyze the impact of changes in sustainability and sustainability reporting (ESG) regulations, such as the Corporate Sustainability Reporting Directive (CSRD) and the European Union Classification Regulation (EU taxonomy), on corporate governance, organization, and processes. We put specific emphasis on internal and external governance, such as internal reporting and control, and the impact on internal and external auditors. Challenges and barriers to meeting increased mandatory requirements will also be analyzed. Research Design/Research Format: The methodology is based on the analysis of academic literature on sustainable governance, the publication of sustainability reports, and recent changes in regulations. Furthermore, we interview managers and accountants of companies in Iceland. The interviews will be transcribed, coded, and analyzed in order to identify the impact of changes in regulation on corporate governance, organizational structures and processes. Results: The results will provide insight into the changes that companies are/will implement to comply with recent regulations on sustainable operations and sustainability reporting (CSRD and EU classification). Furthermore, the results demonstrate the challenges that companies face regarding implementing the regulations and how governance and organization adapt or need to adapt to align with the increased requirements for ESG disclosure. Practical value: Failure to comply with the new regulations and increased stakeholder awareness of sustainability issues could mean reputational risk for companies and possible lawsuits against them. The practical value of this study lies in the results of interviews and academic sources uncovering the main challenges and obstacles in implementing the new ESG regulations. Furthermore, the study will show how companies must adapt governance, organization, and processes to the regulations. Theoretical value and contribution: The study adds to our understanding of sustainability and corporate governance theory by discussing recent regulation, such as CSRD and the EU classification, in the context of theory and to which degree the regulations address not only practical but also theoretical challenges. Given the high speed of developments in sustainability and corresponding

reporting and regulation, the study will also indicate how theory needs to be adjusted in order to reflect the status quo and current trends.

Acting on the Norwegian Transparency act: interpretation and implementation

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The presentation delves into the ramifications of Norway's Transparency Act (Åpenhetsloven, 2021), which was enacted on 1st of July, 2022, compelling businesses to foster human rights and fair working conditions in their supply chains through enhanced transparency. It scrutinizes the interpretation and operationalization of The Act within two distinct companies, employing the Knowledge Transfer as Translation (KTT) theory—traditionally applied to knowledge transfer within corporate culture—to navigate The Act's conversion into corporate actions. This exploration uncovers the obstacles and divergent compliance strategies among the firms, showing that The Act's indeterminate language and the specific resources and individuals within each company lead to varied corporate reactions. Despite The Act's objective to improve supply chain transparency, the lack of clear norms or a unified understanding of the legislation at this early stage results in inconsistent applications. The study also posits that KTT offers a valuable framework for examining the enactment of not only abstract cultural issues but also tangible legal mandates, suggesting its broader applicability in legal interpretation and corporate action alignment.

The "Ghost" Perspective of the Muhammad Cartoons Controversy - the Determining Force of History

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The Muhammad cartoons controversy, initiated by Jyllands-Posten's satirical caricatures in 2005, ignited global violence and sparked a heated debate on freedom of expression versus religious sensitivity. Consequently, the drawings of the Prophet Muhammad have been particularly controversial for many newspapers editorial boards in the aftermath of the controversy.

In this article, we will explore the determining and destructive power behind the published cartoons. We aim to shed light on the persistent danger and high risks associated with the publication of the caricatures, despite newspapers' repeated attempts to dissociate themselves from the consequences. We will delve into the perspectives, rationales and justifications underlying why many editorial boards now avoid publishing the drawings — as well as examine the motivations behind the initial decision to publish them.

In Henrik Ibsen's later works, he explores various articulations of the determining force of history. In the play Ghosts, the father's syphilis recurs in his son Oswald, regardless of how much he tries to free himself from his father's past sins. This literary motif is also apparent in plays like Little Eyolf, Rosmersholm, and Hedda Gabler (Alm, 1999). Through these works, Ibsen reflects on human destiny and how the past casts shadows over the present.

By using Ibsen's works as a lens, we aim to examine the dynamics between societal reactions and individual freedom within a deterministic framework, particularly in the context of the Muhammad cartoons controversy. The "ghost" perspective can help us understand the underlying mechanisms behind the persistent conflict, despite newspapers' repeated attempts to break free from what appears to be the irreversible choices and actions of the past.

Qualitative interviews with eight current and former journalists from Jyllands-Posten, Politiken, and Ekstrabladet (conducted in Copenhagen and Aarhus, May 2023) shed light on the complexities of editorial decision-making. These newspapers were all embroiled in the cartoon crisis of the 2000s. The interviews provide insight into journalists' and editors' perspectives and reflections on the topic, helping to clarify the various factors and the conflicting considerations influencing their decisions. Furthermore, we investigate the influence of historical, cultural, and political factors on editorial practices, contributing to the perpetuation of controversy surrounding the cartoons.

Through empirical analysis and theoretical frameworks, we will explore questions of freedom of expression, cultural context, and the role that satirical cartoons and other visual forms of expression can play in shaping public discourse, aiming to reveal the deterministic power inherent in the published drawings. Ultimately, this article seeks to deepen understanding of the issues surrounding provocative caricatures and stimulate ongoing debate and reflection in the field.

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Track 8 – AI and Ethics

(May Thorseth, NTNU, Trondheim, Norway)

Thursday 29th 8:50-10:30 – Chair: May Thorseth, NTNU, Trondheim, Norway.

Thursday 29th 17:20-18:10 – Chair: May Thorseth, NTNU, Trondheim, Norway.

Session 1

Abstracts

Digitalization of Powerlines Inspection Routine Using AI As an Infrastructuring Process

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The transition to sustainable energy and the electrification of the economy necessitates the robustness of systems and activities. Maintaining powerline infrastructures as a vital component of the energy grid became increasingly critical to prevent any failure and enhance its resilience (Mistra Electrification 2021). Traditionally, powerline inspections were conducted manually, employing foot patrols or helicopter-assisted surveys, methods known for being slow, costly, and potentially hazardous (Nguyen et al., 2018). However, the trend towards greater digitalization and integration of artificial intelligence (AI) and algorithms has revolutionized various sectors, challenging traditional manual approaches. In the energy sector, advancements in AI and data analysis techniques have led to automated virtual powerline inspection possibilities (Nguyen et al., 2018). Specifically, AI-powered software and drones enable more efficient and sustainable inspections of powerlines, reducing dependence on helicopters and foot patrols. Nevertheless, challenges, such as coordinating multiple actors, reconfiguring work practices, data availability, and other related challenges accompany the adoption of AI in powerline inspections.

Infrastructures in modern societies tend to be taken for granted, invisible despite the fact they are central to our societies. In this sense, powerlines are infrastructures par excellence, as they are systems our increasingly more electrified societies rely on to make our lives and economies work. But these infrastructures – powerlines - are embedded in wider and more complex organizational systems, work practices, routines, standards, other materials, etc. Studying infrastructuring processes means giving an account of the invisible work, to what is taken for granted, and the vulnerability of things (Denis & Pontille, 2020). It also means to look at the role of materiality in producing digital information as well as to focus on power relations and ethical choices, and to convey relational and dynamic work that is necessary to make infrastructure work (Bowker & Star, 2000). In this contribution, we propose to look particularly at the process of digitalizing the powerlines' inspection routine using drones and AI algorithmic technologies as a process of "infrastructuring". This means focusing on the hidden work - and neglected things (de la Bellacasa, 2010) that sustain a service, a technology, or an innovation – in this case, the digital virtual inspection work of powerlines, which entails an ample amount of hidden, invisible, and manual work to make the AI algorithmic software work in the intended way. Moreover, we believe that mobilizing the term "infrastructuring" would help us in terms of explaining the gap between AI

algorithmic technologies and their usability and how they can shape the virtual inspection process.

In this paper, we focus on a case study that covers the efforts of two companies, an AI software company located in Northern Europe and a utility company in Southern Europe, who are both engaged in a large AI digitalization project to shift from manual to virtual inspections, using a collaborative AI software for analyzing images of powerlines captured by drones. Besides handling the virtual inspection of the customer's powerlines, the project also entails the development of additional new customized AI algorithmic models. By taking a Routine Dynamics lens, we view the powerlines inspection in utilities as a prototypical routine that features multiple actors engaging in repetitive, interconnected actions that form patterns of action (Feldman, 2015). We also adopt the Routine's Dynamic definition of algorithms as a type of organizational artifact intertwined with other organizational elements in a broader network of actors, practices, and theories in dynamic sociomaterial assemblages, that can have a substantial impact on organizational routines (D'Adderio, 2008, 2011; Glaser, Pollock, et al., 2021; Glaser, Valadao, et al., 2021). Moreover, the aim of the project which provides the empirical case study for this paper is to intentionally design and change the inspection routines using drones and algorithmic artifacts in the form of AI software, thus, we see this case for digitalizing and virtualizing the inspection process as a case of routine design (Wegener & Glaser, 2021), and we borrow the above-outlined concept of "infrastructuring" from STS studies and apply it to this case.

The new configuration implies the design and introduction of revamped organizational routines and practices involving multiple actors, located in a globally distributed setting, technologies, and other materials. Our question is how AI reconfigures the work of powerlines inspections? What is the digital inspection infrastructure about and what does it imply in terms of knowledge production? Upon collecting and analyzing the qualitative data consisting of 38 observations and 13 semi-structured interviews, we propose the adoption of virtual inspections, a process of re-infrastructuring from manual to digital virtual process supported by AI. Our finding indicates that designing the inspection routine and practice using AI algorithmic technology requires rethinking and considering the infrastructural relationship between all human and non-human actors, including human actors, standards, rules, space, time, and material technologies are connected visibly and invisibly in a complex infrastructure assemblage that is entangled sociomaterially and relationally.

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Responsible AI: Evolving Bodies of Practice

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In recent years 'Responsible AI' (R-AI) has been applied to a number of contexts and research applications (Dignum, 2019; Zhu, 2019; De Laat, 2021). On the surface this seems a good thing, as of course we want the development, deployment, and use of AI-systems to be in line with certain normative principles, and it seems the 'responsible' frame can give us just that. R-AI can ensure that AI-systems respect human rights and are aligned with democratic values. However, just what exactly R-AI means is contested, and often undefined. This raises problems for translating the 'principles' of various R-AI guidelines into meaningful 'practices' for those developing AI-systems. As noted, R-AI "has now become a brand-like umbrella term for the development of principles, approaches and methods of understanding what responsible AI development means and how it can be implemented" (Drage, McInerney and Browne, 2024).

While we might welcome this 'umbrella', we ought to be careful. Recent years have also shown that our governance and regulation of AI have, for the most part, been ineffective (Sadek et al., 2024). This paper contributes a novel perspective to this debate by outlining the major historical disciplinary orientations of what would eventually become 'R-AI'. By tracing the history of reflections on technology and responsibility from the 1960s, through STS, computer ethics and roboethics, to the present day, I will present important lessons from each phase of our reflection on technology and responsibility.

These reflections will come to bear on the '1st wave' of R-AI, which began in around 2015. It will allow me to answer questions such as: (1) what is to be included under the 'umbrella' of R-AI, and where do these participants come from? (2) What are the major historical themes and orientations that drive the field? (3) Is there really one R-AI community, or are there sets of intersecting and interconnected communities?

The key takeaway from this study is that 'Responsible AI' is not a label that has to do with some specific set of principles and values. More than that, it remains unclear whether there is one group of practitioners that we can call 'the' Responsible AI community. Instead, what we observe is that R-AI consists of many overlapping and intersecting communities, with diverse, contested, and evolving bodies of practice.

This brief tour showcases the way that ethical reflection on technology has changed over time, and how the focus on AI is a relatively new phenomenon. The practitioners who currently make up the R-AI ecosystem come from these (and many more) disciplines and sectors, and their interaction is what makes the R-AI ecosystem what it is. The hope is that this study, with its focus on the history of R-AI, can help ground these practices in a way that both showcases the dynamism of these distinct sets of practices, and provides some normative orientation for how best to enable a flourishing ecosystem.

By getting a better historical handle on R-AI, we can better promote a philosophically robust understanding of the concept. This means, among other things, acknowledging that there is no 'one' R-AI community, but rather a network of intersecting and interconnected communities. The practitioners who currently make up the R-AI ecosystem come from many different disciplines and sectors, and their interaction is what makes the R-AI ecosystem what it is. R-AI, on this framing, is not a 'problem' to be 'solved', but a process to be governed.

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Developing trustworthy social AI

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Robust social AI – AI that is able to engage with humans in a sustained manner that is experienced as relationally convincing and cognitively appropriate - is becoming increasingly feasible with recent developments in generative AI. Uses for such AI applications range from increasingly capable customer service chatbots to personal AI assistants to AI companions.

The development of social AI raises a range of ethical concerns with regard to the design of humanAI interaction experiences that are relationally acceptable without deceiving users about the nature of the device, without creating experiences that are manipulative or could potentially be detrimental to human users, and without leading to problematic replacement of human contact. Ethical considerations regarding social AI mirror to some extent concerns discussed in relation to social robotics, but with the difference of having the potential of significantly scaled up deployment and substantially more flexible presentations and customisation. Social AI as a primarily digital system also provides substantially increased opportunities of seamlessly integrating surveillance capitalist design elements, both in relation to ongoing intimate data extraction from users and using extracted data for shaping users' behaviour.

The European Commission Ethics Guidelines for Trustworthy AI centre on trustworthiness as important concept to guide the responsible ethical development of AI, proposing a set of seven criteria to achieve trustworthy AI, without, however, providing a more detailed analysis of what characterises trustworthiness itself. The focus on analysing trustworthiness itself is motivated by the need to include the relational element of trustworthiness in the case of social AI - it is not just the product development and deployment that need to meet criteria of trustworthiness, but the user also needs to experience the social AI as trustworthy in their interaction. However, as will be shown, the relational experience of trustworthiness has relevance for understanding the trustworthiness of AI in general.

This paper proposes to draw on a philosophical analysis of the conceptual components of trust and trustworthiness, in order to establish trustworthiness as a suitable concept that can underpin a holistic understanding of responsible innovation in AI. The advantage of drawing on such a conceptualisation is twofold: (i) It has the conceptual resources to differentiate and clarify relational and task-related elements of trust and allow both a re-interpretation of the specific relevance of proposed criteria to the achievement of trustworthiness and the identification of missing or underemphasised relational aspects. (ii) It enables the application of the concept of trustworthiness to different stakeholders with different functions. One important element of trustworthiness is the recognition of responsibility towards the user of social AI and the societal context within which this use is

taking place. Different parties have specific roles and need to engage different actions in response to this responsibility. In the case of social AI three different parties will be highlighted, with each making specific contributions to the achievement of trustworthy social AI: the social AI application itself, the developers, and the organisation that makes the social AI application available to users.

Responsible AI Implementation

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Artificial Intelligence (AI) has ushered in a new age of opportunities and challenges, unlocking its potential in this rapidly evolving technological landscape. It sparks excitement as organisations strive to get the most from investing in AI technology, which helps them improve decision-making, streamline operations, and solve important real-world challenges at scale (Berente et al., 2021). Generative AI has taken the world by storm, generating results based on historical data and future predictions. However, issues arise mainly from the opacity associated with organisations' adoption of AI. These systems can perpetuate biases present in data, lack interpretability in decision-making processes, and they are costly to train and maintain.

Thus, responsible AI has gained significant importance in ensuring trust in AI systems, addressing ethical and legal issues, and fostering ethical decision-making (Brumen et al., 2023; Dignum, 2019), especially with the rise of Generative AI. Responsible AI is defined as a governance framework that documents how a specific organisation addresses the challenges around artificial intelligence (AI) from an ethical and legal point of view (Dignum, 2019). Due to the novelty of responsible AI, literature is revolving and evolving (Rees & Müller, 2022), highlighting the need for continuous exploration, refinement and integration into organisational practices.

Despite the growing literature on responsible AI and numerous guidelines and initiatives, a significant gap remains in translating responsible AI principles into practice within organisational settings. This disparity between the principles and their practical application largely stems from the ambiguity of ethical principles and their perceived inadequacy in effectively addressing the full range of potential negative consequences associated with AI technologies (Jobin et al., 2019; Rakova et al., 2021). Responsible AI is more than just ticking ethical boxes or adding features to AI systems (Dignum, 2019); it considers responsibility, regulation and control, ethics, transparency, design, and socioeconomic impact. The question of how to effectively implement and integrate responsible AI in organisations has become more important than ever, as it profoundly affects business, the environment, and society. By reviewing the literature on responsible AI, this paper will explore the 'how' of responsible AI governance in the organisational context and shed light on the implementation perspective.

The paper's findings indicate that responsible AI practices result in increased confidence and trust in decision-making. Collaborations that foster an inclusive AI ecosystem that addresses common challenges associated with AI systems. Additionally, a lack of leadership support hinders deep engagement with responsible AI issues. The paper contributes to enhancing

the understanding of responsible AI implementation, revealing contextual factors and insights into cultural and organisational changes for effective AI implementation.

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Algorithms down from the Moral Ivory Tower: Towards an Ideal 'Non-Ideal' Theory of AI Ethics.

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In the field of political philosophy, the 'ideal theory' approach to justice begins by suggesting a hypothetical 'ideal' state (derived from hypothetical ideal socio-political conditions) to which we should aspire (Valentini, 2012). AI ethics can be said to align with this paradigm (cf. Fazelpour & Lipton, 2020; Estrada, 2020), as much of the existing literature on AI ethics focuses on 'top-down' institutional guidelines and the discussions surrounding the principles that constitute them, such as *transparency*, *justice*, *fairness*, *non-maleficence*, *responsibility*, and *privacy* (Jobin et al., 2019). These principles have been criticized for being overly vague and lacking in semantic content, providing limited specific recommendations, and failing to address the fundamental normative and political conflicts inherent to key concepts (Mittelstadt, 2019). In addition to these constraints, this approach can also lead to detrimental outcomes, such as paving the way for ethics-washing (van Maanen, 2022), and potentially triggering irresponsible behavior arising from the mismatch between algorithms and their real-world application contexts (Munn, 2023). Given political diversity and the resulting disagreements about moral questions—and sometimes even about the nature of morality itself—many traditional and conventional moral 'high' principles fall short in guiding the design of AI (Robinson, 2023). Agents adhering to various principles often favor different policies (Woodgate & Ajmeri, 2024).

The 'non-ideal theory' approach, on the other hand gives precedence to the realities and limitations of our dynamic and non-ideal world. It addresses issues such as the feasibility and fact-sensitivity of principles (Volacu, 2017), and tends to derive and base its principles on empirical facts observed in the world. When considering this in the context of AI ethics, one might suggest acknowledging and addressing the diverse and often conflicting interests within society and thereafter align algorithms accordingly (Wong, 2020). However, this approach carries its own set of challenges and can lead to substantial and unforeseen consequences; some of which could be disastrous (Baum, 2020). While considering stakeholder values and needs is crucial and acquiring descriptive information about them may prove useful, this alone cannot resolve all potential value tensions between diverse opposing groups, leaving designers and policymakers to continue having to navigate complex ethical decisions. Thus, we come full circle, finding ourselves once again dependent on more 'abstract' ethical principles to mitigate or manage potential trade-offs (Woodgate & Ajmeri, 2024). But which ethical principle(s) should we adopt to resolve such tensions and conflicting needs? Should we rely on the moral beliefs of an individual, a specific society, or a collective global consensus—assuming one exists?

In an attempt to resolve this dilemma, we propose an *ideal 'non-ideal' theory of AI ethics*—an 'ideal' approach to principles that are grounded in 'non-ideal' premises, such as fact-sensitivity and feasibility, while considering the everchanging public interest (Züger & Asghari, 2023). These 'overarching' principles are here given a *prima facie* status that is subject to ongoing reassessment, while serving also as guardrails to prevent undesirable outcomes and maintain broader global consistency. In this pragmatic approach, overarching principles are balanced with localized needs, creating a system of checks and balances between the two levels to ensure certainty, predictability, and safety. This approach aims to acknowledge the inevitable trade-offs between the practical realities of the non-ideal world we inhabit and the need for some type of higher-order principles. The framework aims to ensure that the solution remains consistent, flexible, and ethically robust, accounting for the global nature of AI while embracing the politically diverse landscape, thus reflecting the techno-social dynamics of our times.

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Session 2

Chair: May Thorseth, NTNU, Trondheim, Norway

Abstracts

Digitalization of Powerlines Inspection Routine Using AI As an Infrastructuring Process

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The transition to sustainable energy and the electrification of the economy necessitates the robustness of systems and activities. Maintaining powerline infrastructures as a vital component of the energy grid became increasingly critical to prevent any failure and enhance its resilience (Mistra Electrification 2021). Traditionally, powerline inspections were conducted manually, employing foot patrols or helicopter-assisted surveys, methods known for being slow, costly, and potentially hazardous (Nguyen et al., 2018). However, the trend towards greater digitalization and integration of artificial intelligence (AI) and algorithms has revolutionized various sectors, challenging traditional manual approaches. In the energy sector, advancements in AI and data analysis techniques have led to automated virtual

powerline inspection possibilities (Nguyen et al., 2018). Specifically, AI-powered software and drones enable more efficient and sustainable inspections of powerlines, reducing dependence on helicopters and foot patrols. Nevertheless, challenges, such as coordinating multiple actors, reconfiguring work practices, data availability, and other related challenges accompany the adoption of AI in powerline inspections.

Infrastructures in modern societies tend to be taken for granted, invisible despite the fact they are central to our societies. In this sense, powerlines are infrastructures par excellence, as they are systems our increasingly more electrified societies rely on to make our lives and economies work. But these infrastructures – powerlines - are embedded in wider and more complex organizational systems, work practices, routines, standards, other materials, etc. Studying infrastructuring processes means giving an account of the invisible work, to what is taken for granted, and the vulnerability of things (Denis & Pontille, 2020). It also means to look at the role of materiality in producing digital information as well as to focus on power relations and ethical choices, and to convey relational and dynamic work that is necessary to make infrastructure work (Bowker & Star, 2000). In this contribution, we propose to look particularly at the process of digitalizing the powerlines' inspection routine using drones and AI algorithmic technologies as a process of "infrastructuring". This means focusing on the hidden work - and neglected things (de la Bellacasa, 2010) that sustain a service, a technology, or an innovation – in this case, the digital virtual inspection work of powerlines, which entails an ample amount of hidden, invisible, and manual work to make the AI algorithmic software work in the intended way. Moreover, we believe that mobilizing the term "infrastructuring" would help us in terms of explaining the gap between AI algorithmic technologies and their usability and how they can shape the virtual inspection process.

In this paper, we focus on a case study that covers the efforts of two companies, an AI software company located in Northern Europe and a utility company in Southern Europe, who are both engaged in a large AI digitalization project to shift from manual to virtual inspections, using a collaborative AI software for analyzing images of powerlines captured by drones. Besides handling the virtual inspection of the customer's powerlines, the project also entails the development of additional new customized AI algorithmic models. By taking a Routine Dynamics lens, we view the powerlines inspection in utilities as a prototypical routine that features multiple actors engaging in repetitive, interconnected actions that form patterns of action (Feldman, 2015). We also adopt the Routine's Dynamic definition of algorithms as a type of organizational artifact intertwined with other organizational elements in a broader network of actors, practices, and theories in dynamic sociomaterial assemblages, that can have a substantial impact on organizational routines (D'Adderio, 2008, 2011; Glaser, Pollock, et al., 2021; Glaser, Valadao, et al., 2021). Moreover, the aim of the project which provides the empirical case study for this paper is to intentionally design and change the inspection routines using drones and algorithmic artifacts in the form of AI software, thus, we see this case for digitalizing and virtualizing the inspection process as a case of routine design (Wegener & Glaser, 2021), and we borrow the above-outlined concept of "infrastructuring" from STS studies and apply it to this case.

The new configuration implies the design and introduction of revamped organizational routines and practices involving multiple actors, located in a globally distributed setting, technologies, and other materials. Our question is how AI reconfigures the work of powerlines inspections? What is the digital inspection infrastructure about and what does it imply in terms of knowledge production? Upon collecting and analyzing the qualitative data consisting of 38 observations and 13 semi-structured interviews, we propose the adoption of virtual inspections, a process of re-infrastructuring from manual to digital virtual process supported by AI. Our finding indicates that designing the inspection routine and practice using AI algorithmic technology requires rethinking and considering the infrastructural relationship between all human and non-human actors, including human actors, standards, rules, space, time, and material technologies are connected visibly and invisibly in a complex infrastructure assemblage that is entangled sociomaterially and relationally.

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Reflections on Incorporating RRI Goals into Online Violence Prevention Research

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The global rise of violence-inducing behaviour such as hate speech in social cyberspace is a major cause of concern [NOU 2022, 2023]. This complex, multi-layered, and dangerous behaviour often channelled through mis- and disinformation has been identified as one of the leading crises of our lifetime. According to the World Economic Forum report, the hate speech crisis is projected to worsen if not addressed through transformative, responsible, and innovative research [WEF2024]. Hate speech is a crisis for the whole of society and we will have a significantly better chance of tackling this challenge if different societal actors are engaged in the co-construction of innovative solutions. Responsible Research and Innovation (RRI) means that societal actors work together during the whole research and innovation process to better align both the process and its results, with the values, needs and expectations of our society [EC, 2012].

To address hate speech, we should take a systemic, transparent and responsible approach to carefully understand how hate speech evolves, particularly in times of disasters, when disinformation triggers polarisation and discrimination towards marginalised groups. Without "responsibility by design", transparent studies, and close collaboration between public authorities, NGOs and human rights institutions, research organisations, civil society organisations, and citizens it will be exceedingly difficult to handle such online information disorder [Stahl, 2021].

To address this issue in Norway, the transdisciplinary research project – SOCYTI is developing a cloud-based, real-time detection system capable of evaluating multilingual text and images from social media posts for hateful content on a larger scale than ever previously possible. SOCYTI is an ambitious effort intended to help communities prevent the spread of hate speech online [SOCYTI, 2022]. In addition to social science, computer science, ethics, and legal analysis, the project draws on local expertise and thus strives to be transdisciplinary. The project will lead to technological solutions developed in compliance with Norwegian societal values, fundamental rights and applicable legislation, including in

the area of privacy and data protection as well as ensuring explainability, accountability and promoting transparency of technological solutions that society can trust.

We believe in the importance of reaching out to stakeholders from all distinct parts of society because hate speech prevention is the responsibility of the whole society. There are different perspectives on the issue, and our work has potential utility and consequences for many kinds of people. Thus it is important that our data and results meet open science goals to be accessible to those same people. To involve non-academics in the project, we have utilised three main strategies so far: in-person workshops, surveys and interviews. All stakeholder-experiences are unique to their organisational mandate, these experiences (continue to) guide our research trajectory as they provide multi-dimensional knowledge our research seeks. The surveys are seeking informants who may have been subjected to hateful speech online or have close networks that may be vulnerable. The workshop(s) are also arenas for promoting dialogue for building partnerships and synergies between stakeholders.

In this presentation we will reflect on the opportunities and challenges we are facing in meeting RRI goals while working on the SOCYTI project such as communicating with diverse stakeholders, sustaining community engagement, and utilising the experiences of vulnerable communities. We will further discuss how we can build on our specific experience to go beyond the existing RRI discourse in design and implementation of the SOCYTI system. AFINO Conference: Transformative Research and Innovation – Track 12

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Track 9 – Innovation and culture

(Giovanni De Grandis, NTNU, Matthias Kaiser, UiB)

Thursday 29th 17:20-18:10 – Session 1 – Chair: Matthias Kaiser

Friday 30th   13:20-15:00 – Session 2 – Chair: Giovanni De Grandis

Session 1

Chair: <u>Matthias Kaiser</u>, University of Bergen, Norway

Abstracts

What Makes Study of Disagreements about Biotechnologies Responsible? Lessons from the Case of Golden Rice

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Although science and technology studies (STS) scholars often explore disagreements and controversies about the ethical and social acceptability of use of biotechnologies in specific contexts, there has been much less reflection about the norms and frames used by STS scholars and others when doing these types of studies (exceptions include Hesselmann's provocative 2019 exploration of understandings of scientific misconduct from a postcolonial perspective) or using them in the context of teaching scientists. Such controversies often become focal points for public or advocacy groups seeking to draw development or use of biotechnologies into question, but also by scientists who wish to emphasise the problematic nature of public involvement in technical issues or even how regulation and public opinion can derail scientific progress.

In this paper, we explore one such focal point, the processes and policies associated with the development and release of Golden Rice. Golden Rice (Oryza sativa) is a variety that has been produced through genetic modification to biosynthesize betacarotene (a precursor of vitamin A) in the edible parts of the rice. Its primary intended use is in fortified food which are to be consumed in locales with low levels of dietary vitamin A and higher levels of vitamin A deficiency which can cause a range of severe eye issues along with increasing risks of mortality in children from common diseases such as measles and diarrhea. Golden Rice provides an excellent example for an exploration of responsibility amongst STS and other scholars of biotechnologies because its development and application have received significant criticism from grass roots, environmental, and anti-globalisation activists, whereas the broad scientific community has been highly supportive of its use, advocating deregulation and rapid deployment due to the significant health issues that it could be used

to address. We also have chosen to investigate Golden Rice because in our experiences it is frequently invoked by scientists in discussions of the socioethical, regulatory, and RRI-related issues associated with genetic modification as a 'success story' of the triumph of science over what they view as politics and regulatory capture.

However the rich tapestry of stories about Golden Rice at various points in time and in the locales where deployment was desired are messy and complex. We consider how to enrich our understandings of this type of controversy, particularly for the purposes of training researchers about RRI considerations and STS and other social science researchers about teaching about RRI. We invert Latour's idea of an 'artificially maintained scientific controversy' (2004) to show how application of artificial pressures to shut down controversy can result in difficulties for those teaching about RRI. We sketch an approach to reclaiming Golden Rice as a useful case for considering issues relating to RRI in relation to both the responsibilities of scientists and scholars of science.

Cultured meat and responsible research when the future is an illusion for financial speculation

Richard Helliwell, Ruralis, Norway

Developments in cultured meat promise transformative societal and environmental impacts through remaking animals in the bioreactor. While STS is no stranger to speculative claims and transformative promises, there is a danger that research has yet to grapple with an important undergirding shift. The niche of cellular agriculture research and innovation is almost entirely sustained through private venture capital investment. Not just the ideologies but the financial infrastructure of Silicon Valley is the foundation upon which the creation of cultured meat – as a product and as a vision – is based. The envisioned futures of cultured meat are unfolding within a context of constantly shifting frontiers of hype and financial speculation. There are major incentives to sell a vision that is attractive within such dynamics and importantly deceive, in terms of technical possibilities, moral progress, and societal prospects, to sustain an illusion of imminent breakthrough and lucrative financial return on investment. Responding to such expectations, European countries, such as France and Italy, are now creating legal frameworks to 'defend' national agriculture against these hyped products.

The future of cellular meat is a frontier for financial speculation. The danger then is that good faith social science interest in innovation, science and technologies works to legitimate these speculative dynamics. In part, driven by our own incentives to get funding and publish novel research on the evolving frontier of science and technology. Furthermore, the credibility of start-up founders and their future visions is often derived from presumed due diligence on the part of investors. Investors, who have been shown by fiascos such as the collapse of Theranos Inc. and FTX/Alameda, to be readily taken in by aesthetic parlour tricks, fear of missing out, herd mentality, and blinded by greed. In this presentation we seek to reflect on the ethical and methodological consequences of these dynamics using cultured meat as a case to reflect on the challenges for researching emerging technologies and future promissory discourses.

Session 2

Chair: <u>Giovanni De Grandis,</u> NTNU, Trondheim, Norway

Abstracts

Mobilization, relevance and rigor: RRI as a policy concept

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Umbrella concepts like Responsible Research and Innovation (RRI) have the capacity to unite researchers from otherwise disparate fields under their umbrella (Rip & Voß, 2013). They are thus effective in mobilizing researchers for a cause—or causes, namely the ones that can meaningfully be subsumed under their label. Thus, to maximize their mobilization effects such concepts are usually rather broad and allow for interpretations. However, the resulting interpretative viability—or pragmatic ambiguity—comes at a cost, namely the lack of conceptual rigor (Benders & Van Veen, 2001; Giroux, 2006). Among researchers engaging with RRI, the perceived lack of clarity about what RRI entails have led to many expressions of frustration (e.g. Rip, 2016), countless attempts at clarifying what the content of the RRI signifier is or should be (e.g. Christensen et al., 2020; Fisher, 2020; Owen et al., 2013; Ribeiro, Smith, & Millar, 2017; Schuijff & Dijkstra, 2020), as well as how the term and related thinking has been used and by whom (e.g. Randles, Tancoigne, & Joly, 2022).

A central tenet of the research and innovation policy of the European Union, as expressed in e.g. the Rome Declaration (European_Union, 2014), and the Horizon 2020 program that accompanied the declaration, is that engagement with RRI should diffuse beyond scholarship and researchers mobilized by the term to become institutionalized as new practices for the undertaking of research and innovation (Owen, Macnaghten, & Stilgoe, 2012). The discussion about the diffusion of RRI as lived practice beyond a community of researchers benefitting from the concept in various ways, signals that research on organizations' use—and misuse— of ideas on how to organize and manage is a relevant theoretical framing for the diffusion of practices question.

The field shares with research in policy concepts, how some concepts emerge as fashionable and then disappear (Abrahamson, 1996; Downs, 1972; Kieser, 1997), sometimes to reemerge under new label (Spell, 2001). The field too has a tradition for umbrella concept research (Hirsch & Levin, 1999), which is closely related to what has become known as the 'relevance-rigor' debate (Fincham & Clark, 2009; Rynes, Bartunek, & Daft, 2001). In the rigor-relevance debate, it is commonly assumed that broad concepts are of relevance to practitioners, whereas most researchers prefer narrow concepts, where cause and effect can easily be accounted for (Daft, 1980; Hirsch & Levin, 1999). This insight leaves open the extent to which the scientific knowledge created in the field of management and organizational scholarship represent much else than language games to practitioners (Astley, 1985).

Using this literature as a point of departure, I ask if the use of broad umbrella concepts in science policy leads to enhanced relevance of science to practitioners? Based on an implementation study of RRI in 23 science funding and science performing organizations globally, I show that the umbrella character of RRI may help mobilize a community of scientists, but that practitioners struggle to connect RRI to discernible organizational practices. In contrast, the theorized individual aspects of RRI lend themselves comprehensible to practitioners as something they may successfully enact. The mobilizing effects of RRI for both scientists and practitioners appear connected to its heralded visions, the legitimacy provided by its various institutional anchorages, and its newness, rather than to any clear comprehension of what constitutes practices of RRI. These findings question widely held assumptions about what 'relevance' is to practitioners, as well as what constitutes 'practicable' science concepts. I topically review umbrella concept theorizing in organizational science and in science and technology studies and discuss findings in the light of the thus emerging dimensions of the functions of umbrella concepts.

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Understanding responsiveness in the responsible innovation process: A case study in the Brazilian manufacturing industry

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Organizations have been pressured to consider the possible impacts of their innovations on society and the environment. It is essential to ensure that new technologies, products, and services are developed and used transparently, inclusively, and ethically. In this context, responsible innovation (RI) has been identified as a promising area to face the challenges of the transition to a sustainable economic development model. RI refers to "a transparent and interactive process by which social actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and social desirability of the innovation process and its marketable products" (Von Schomberg, 2013, p. 19). RI assesses innovations' potential positive or negative impacts (Voegtlin et al., 2022). However, it can be difficult to predict the consequences of innovation in its early stages (Zhang et al., 2023). Thus, although there is a growth in studies on RI, research is still predominantly at a conceptual level, with a need for more empirical investigations (Zhang et al., 2023). Based on this, Stilgoe et al. (2013) proposed a theoretical framework composed of four dimensions to understand how organizations direct their innovations more responsibly: anticipation, reflexivity, inclusion, and responsiveness. These four dimensions overlap; therefore, their integration is important for robust results in developing RI (Ahuja et al., 2023). However, what can be seen in the literature is that there is a greater concentration of research on the inclusion of stakeholders (Silva et al., 2019), deepening reflexivity on the risks and unexpected results of innovations (Gómez; Ballard, 2013) and in the mechanisms that promote the anticipation of possible consequences (Khan et al., 2021). Few studies still

address questions about the responsiveness dimension (Ayoub; Abdallah, 2019; Stockmann; Winkler, 2022). Responsiveness involves the organization's ability to constantly monitor and evaluate the impact of its innovations, making necessary adjustments to ensure that its solutions remain responsive. This dimension represents the organization's ability to respond to the other three dimensions of RI, acting as a unifying factor (Stilgoe et al., 2013). Despite its importance, this dimension is considerably less explored in discussions about responsible innovation, associated in previous studies with identifying potential risks, transparency, ethics, and accessibility (Burget et al., 2017). Therefore, there are gaps in knowledge about the elements that can improve organizations' responsiveness and facilitate the concrete and effective production of responses to changes (Ayoub; Abdallah, 2019; Stockmann; Winkler, 2022). Therefore, this study aims to analyze the elements that contribute to enhancing the responsiveness of responsible innovation. Qualitative research was carried out based on a single case study in a traditional Brazilian industry, nationally recognized for its concern with the socio-environmental impact of its innovations. The results showed how responsible innovation is conducted, highlighting how the dimensions of anticipation, inclusion, reflexivity, and responsiveness are empirically observed. Based on this understanding, our study demonstrates the elements that allow organizations to enhance their responsiveness. Specifically, we discussed three elements that were essential for the company to leverage the responsiveness of responsible innovation: analytical intelligence for greater ability to detect changes in context and user needs; procedural agility with the use of management tools that encourage collaboration and facilitate the flow of information and ideas; adaptive flexibility that allows the articulation of functions, modifying the distribution and sequencing of tasks. This study contributes by guiding elements that can help organizations improve responsiveness in the innovation process.

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Sacred RRI? The role of faith in innovation policy

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A promising area within Responsible Research & Innovation (RRI) research has been the ongoing scholarship on how, across diverse contexts, the values and ethics of innovation and its outcomes are shaped by organizations, ideas, and cultures. One salient aspect, however, that has been largely overlooked up to the present is the role of faith or religious traditions. Take for instance the Journal of Responsible Innovation, a leading RRI journal, where there are at the time of writing zero publications engaging with or even discussing faith as a (not the or dominant) facet of shaping the values or ethics of innovation (with one predictable exception being Islamic Finance: Hilmi 2018). This reflects a larger eschewing of religious traditions from within the social sciences, in particular innovation policy, where analysis and investigation on their contemporary relevance is scarce – a tacit dismissal of faith as at worst normatively regressive or at best private and unscientific. Yet there are at least two counterpoints that point to the importance of including faith on the research and policy agenda of RRI. First, the opposite of private, many religious traditions are manifest and interwoven within society, especially in the non-Western world, making faith an undeniably relevant factor to consider. Second, rather than retroactive inclusion, religious traditions already have much to say regarding the aspects of humanity that are non-market oriented i.e. that define and contribute to the commonweal. In this paper, we therefore posit that if RRI is meant to understand the purpose of innovation in a more inclusive way and develop values-based principles to pursue it, we can no longer afford to overlook the role of religious traditions. Concretely, we suggest two ways to arrive at a 'sacred' RRI policy: selection and navigation. We start with the premise that there must be a rubric beyond market mechanisms to engage with what broad areas and particular technologies innovation should proceed i.e. ascertaining what is good and bad innovation. There are analogous cases in areas like investment and consumer awareness where adoption of initiatives such as ESG

and B Corp hold companies to certain social and sustainability standards (Hughes et al. 2021, Moroz & Gamble 2021), albeit from mainstream (Western) perspectives. To return to RRI, we argue that faith-based and community-embodied value systems, often times as indigenous commons (Berket 2018), are informed by much more than calculated profit maximization or self interest, and accordingly, so should the directionality of innovation. Selection as a tool of sacred innovation policy would therefore be a set of goalposts to determine what innovation should move forward, whereas navigation would be how innovation should move forward i.e. a set of guardrails. Together, both act as two levers that determine the destination and keep the course of innovation. For instance, in many faith traditions, white phosphorus munitions would not be a permissible thing to develop and innovate on (let alone utilize) because by design they are intended for and will succeed in indiscriminate destruction of life and ecosystems. This is an instance of selection, whereby such a technology would simply not receive funding nor a diversion of talent to carry forth the innovation process. Another example would be a diagnostic device that can generate rapid and accurate health scans (an unequivocally beneficial outcome) although the components utilized in the current production process are directly procured from mining facilities that exploit child labor. As an instance of navigation, a sacred RRI policy would require altering the upstream production process to either identify an ethical source or develop an alternative e.g. recycle obsolete electronics.

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Project Archetypes: Exploring the Field Patterns of the European Research Area

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This paper formulates and explains the project archetypes' pattern that characterises the involvement of the European Southern Neighbourhood in the European Research Area. This enquiry into the relationality weaved by research collaboration presents four archetypes. The main empirical material employed to model and study the four archetypes is semi-structured interviews with Europe-based project managers. This paper presents European Union science diplomacy and looks at how multilateral research-driven ties support post-Westphalian external action objectives, drawing on the insights provided by leading figures of projects financed by the Framework Programme 7 and Horizon 2020. Expert experiences of co-developing research-intensive solutions with Morocco- and Tunisia-based colleagues to address the most pressing challenges faced by the European Union and its Southern

neighbours offer new insights into the patterned routines that support the implementation of such supranationally steered governance frameworks as the European Research Area, including its external action and science diplomacy dimensions. Almost half of the studied projects correspond to the archetype with one EU-funded project interaction. This confirms the rather sporadic or ad hoc relational ties of the European Southern Neighbourhood to the European Research Area, facilitated by various Europe-based competence centres. A list of projects combined with other collaborative engagement modalities is less prevalent. Nevertheless, there are several instances proving that Europebased managers are eager and capable of sustaining ties with their European Southern Neighbourhood counterparts based on diverse funding sources. Thus, to a considerable degree, the dynamics and relational ties of the European Research Area are embedded in a broader international research landscape, not siloed away from it.

The categorisation of projects under four archetypes enables a better understanding of the structure of the European Research Area beyond its major division into Bourdieusian subfields. To understand the modalities of these subfields, archetypes are instrumental. Archetypes demonstrate the relational logic and project-oriented management solutions that put in motion the European Research Area subfields. Archetypes offer a more nuanced understanding of the considerations guiding experienced research project managers in extending collaborative plans across the European Southern Neighbourhood. Archetypes better illustrate what pattern of expert circle encounters supports European Union external action, in what settings, and for how long the European Union science diplomacy projection unfolds through shared 'kn/own/ables' and new initiatives offered to the European Southern Neighbourhood through European 'technoscientific gifts'.

The enthusiasm to develop European Union external action studies by employing various theoretical and conceptual elements and methodological approaches is important not solely for this emerging field of studies. Seen more broadly, this receptiveness to various stances and the processing of diverse empirical material bring continuous intellectual dynamism to the more than century-old thinking on international relations. European Union external action studies, such as this one, may serve as a source of inspiration for other compartments of international relations and indicate prospective pathways for reinvigorating research agendas with a fresh look at classics and European integration as a reinvented and reinvigorated tradition.

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