Editorial

Innovating Responsibly—Challenges and Future Research Agendas

Tatiana Iakovleva [1,*], John Bessant [1], Elin Oftedal [2] and Luciana Maines da Silva [3]

1   Department of Innovation, Marketing and Management, Stavanger Business School, University of Stavanger, 4036 Stavanger, Norway; johnrbessant@googlemail.com
2   Department of Media and Social Sciences, Faculty of Social Sciences, University of Stavanger, 4036 Stavanger, Norway; elin.m.oftedal@uis.no
3   Unisinos Business School, Unisinos University, Porto Alegre 90470-280, Brazil; LUCIANAMAINES@unisinos.br
*   Correspondence: tatiana.a.iakovleva@uis.no

Innovation involves creating value from ideas, but this raises the question of for whom is the value created? Especially when there is growing recognition of global challenges such as poverty, inequality, aging population or availability of quality healthcare [1], responsible research and innovation (RRI) is suggested to govern innovation development. The core principles of RRI suggest broader stakeholder inclusion during the decision-making process, the anticipation of societal needs and reflection of concerns and a capacity to build flexibility into innovation wherever possible [2–4]. Aligning with these principles calls for new innovation policies [5,6] without which there may be problems; in particular the failure of institutions to include all layers of society into decision-making processes can lead to a sense of an individual powerlessness. The expression of anger and mistrust at this situation can become amplified through the widespread use of digital media platforms and sometimes lead to fundamental instability, such as the "yellow vests" in France, protests against Brexit, and the unpleasant divisions surrounding US politics.

While the theoretical development has focused on normative models of RRI, relatively few empirical studies exist. Further, the literature mostly concerns early stage research projects rather than their implementation at the firm level [7,8]. Despite the recognition of the importance and value of stakeholder-inclusion in the product development process, RRI often involves articulating a process of governance with a strongly normative loading, without clear practical guidelines toward implementation practices [9].

While several conceptual models of RRI have been developed, there is still a need to examine what these frameworks mean for practitioners [9–11]. Work referring to responsible research and innovation (RRI) often looks at the scientific aspect and the development process in 'grand challenges' like climate change, resource depletion, poverty alleviation, ageing societies, etc. Thus, the RRI concept may follow the same path as the concept of Corporate Social Responsibility, which has been criticized for being employed at the level of corporate philanthropy. At the same time, it was originally meant to shape the corporate identity of companies [12] strategically.

The term responsibility has a long heritage as a field of research and practice. Today the discussion focusses on key themes such as sustainability, ethics and social responsibility in a wide range of books and journal [6,13]. For example, [7] finds that involving stakeholders in the process is challenging for innovation processes. Grand challenges require complex solutions and stakeholders are often very diverse. Therefore, stakeholder inclusion might slow down the innovation process. Another barrier is that social outcomes are difficult, and openness and transparency are limited because innovators and investors value exclusive information.

The principles of RRI direct us to involve the user early in the innovation process, but they lack direction on whom to involve, how to involve them, and at what stage [8]. While

several researchers claim that RRI is advantageous for businesses [14], other studies point to the negative effects of RRI on innovation processes [15].

With this background, we suggest that responsibility lies with individual actors [10] and that responsible decisions need to be undertaken at the firm level [16]. We suggest there is scope for 'responsible innovation' (RI) approach, which has a more fine-grained focus on the innovation itself [17,18] and may be more amenable to operationalization.

In this SI we invited theoretical and empirical contributions that focus on how firms organize their entrepreneurial and innovation process to ensure responsible outcomes. This Special Issue includes seven articles that all address firm practices.

The first article by Carla Gonzales-Gemio, Claudio Cruz-Cázares and Mary Jane Parmentier entitled "Responsible Innovation in SMEs: A Systematic Literature Review for a Conceptual Model" provides a bibliometric analysis of 102 articles collected between 2000 and April 2020 from the Web of Science. Gephi and NVivo software were applied to perform the systematic literature review. The study presents an overview of the articles, authors, identifies the most influential journals and research clusters, and provides a solid conceptual framework to be applied in this field and in the context of SMEs.

The next article, by Arnt Fløysand, Emil Tomson Lindfors, Stig-Erik Jakobsen and Lars Coenen "Place-Based Directionality of Innovation: Tasmanian Salmon Farming and Responsible Innovation" explores the place-based conditions enabling and constraining the directionality of responsible innovation in the Tasmanian salmon farming industry. Authors combine literature on responsible research and innovation (RRI), regional innovation system (RIS) and discourse theory. The article address innovation as a territorial complex consisting of a material dimension in terms of technologies and resources, an organizational dimension in terms of innovation systems and regulations, and a discursive dimension in terms of narratives in play. The Tasmanian case analyzed in this article highlights the point that the directionality of responsible innovation arises from a rather mature and well-organized regional innovation system, which allows multiple stakeholders to articulate their narratives. Under such circumstances, responsible innovation becomes a multidimensional, interactive, and co-created phenomenon consisting of several dilemmas. Although the contextualization of responsible innovation is highlighted, this study also acknowledges that certain "universal" characteristics continue to play a role. In particular, authors argue that context sensitivity must not supersede the fact that place-based responsible innovation is always subject to some generic dynamism: under all circumstances there will be a territorial innovation complex at play.

The article by Agata Gurzawska entitled "Responsible Innovation in Business: Perceptions, Evaluation Practices and Lessons Learnt" seeks to gain insights about the integration of the responsible innovation (RI) concept into companies' practices based on twenty four interviews with companies and business experts. The article unlocks how companies apply principles, frameworks and evaluation practices related to RI. The results emphasize the confined character of companies' RI practices in the context of corporate social responsibility (CSR), sustainability and ethics. Moreover, the results indicate two main types of RI evaluation and control among companies: assessment and guidance. This paper discusses the theoretical and practical implications of discrepancies in understanding and evaluating RI for large corporations and small and medium-sized enterprises (SMEs). Consequently, new approaches to RI in business are proposed, calling for strategic and responsible innovation management.

The article by Beniamino Callegari and Olga Mikhailova entitled "RRI and Corporate Stakeholder Engagement: The Aquadvantage Salmon Case". It addresses the problems that firms meet while working with radical innovations, such as genetically modified products. The principles of RI often contradicts with firm practices, and this duality is enlightened in the present research. The authors argue that reducing external interaction with stakeholders, focusing on exclusive communication with the scientific community and legal authorities while avoiding the social spotlight highten the risk of social backlash, being undesirable from the perspective of both the organizations involved and society. Stakeholder

engagement remains necessary to gain the minimum social acceptance required for contentious innovative products to enter the market. However, stakeholder engagement must be selective, focused on pragmatic organizations whose aims and interests are sufficiently broad to align with corporate interests potentially. Strategic stakeholder engagement offers a meeting point between the transformative aspirations of RRI framework proponents and legitimate business interests.

The article by Tatiana Iakovleva, Elin Oftedal and John Bessant entitled "Changing Role of Users—Innovating Responsibly in Digital Health" looks in particular on stakeholder inclusion in innovation process. Based on 11 cases of firms innovating in digital health and welfare services, it looks at firm practices for user integration into their innovation process, as well as how the user's behavior is changing due to new trends such as availability of information and digitalization of services. Findings indicate that users are not a homogenous group—rather, their willingness to engage in innovative processes is distributed across a spectrum, ranging from informed to involved and, at extreme, to innovative user. Further, the authors identify the user and stakeholder inclusion signs in all our cases in different degrees. The most common inclusion group involves users, and firms' practices vary from sharing reciprocal information with users to integration through focus groups, testing, or collecting more formative feedback from users. Although user inclusion into the design space is perceived as important and beneficial for matching with market demands, it is also a time-consuming and costly process. The article concludes by debating some policy impacts, pointing to the fact that inclusion is a resource-consuming process, especially for small firms, and that policy instruments have to be in place to secure true inclusion of users into the innovation process.

The article by Milena Gojny-Zbierowska and Przemysław Zbierowski "Improvisation as Responsible Innovation in Organizations" looks at improvisation as a method of responsible innovation in organizations. It provides interesting linkages between theories of responsible Innovation, improvisation and entrepreneurial orientation. The authors use a framework of improvisation as a three-dimensional construct: creativity and bricolage, ability to function and excel under pressure and in stress-filled environments, and spontaneity and persistence. Entrepreneurial orientation is presented as a three-dimensional construct (innovativeness, proactiveness, and risk taking). Using the data from 567 senior managers from medium and large organizations this study found that improvisation has moderate effect on entrepreneurial orientation. Importantly, different dimensions of improvisation shape EO components in different ways: Creativity and bricolage positively impact innovativeness and proactiveness, and the ability to function and excel under stress impacts the propensity to take the risk. The study has implications for the theory of responsible innovation by highlighting the potential of improvising to generate more responsive and stakeholder-involving behavior and, consequently, more responsible innovation.

The last study, conducted by Thammarat Koottatep, Krisakorn Sukavejworakit and Thanaphol Virasa "Roadmap for Innovators in the Process of Innovation for Development" provides valuable insights into the process of innovation for development on the example of case "Reinvent the Toilet Challenge". This case describes an initiative of the Gates Foundation in Thailandto create sustainable sanitation solutions for the 2.5 billion people across the globe who lack access to safe and affordable sanitation. By gaining insights into how innovators interact with key stakeholders, this study analyze the process of innovation for development and the role of innovation brokers in the innovation process. Authors suggest a roadmap from the perspective of responsible research and innovation (RRI) to guide innovators, project leaders, industry partners, local government, and policy makers in the process of innovation for development.

This Special Issue demonstrates emerging 'best' practices and dilemmas and challenges of implementation of the responsible innovation principles. While acknowledging that broader stakeholder involvement might benefit the innovation process, it becomes obvious that firms alone have challenges implementing such involvement fully. The article by Callegari and Mikhailova clearly describes such dilemmas for the Salmon case and a

similar argument is present in the study by Fløysand et al., where the authors describes changes of responsible innovation for the Tasmanian case. The study by Iakovleva et al. describes user involvement for cases in digital health, outlining best practices and debating the design space and front end of innovation as crucial for the responsible innovation process. In a broader investigation by Gurzawska of 24 companies, she also outlines resources and time constraints that firms meet. Challenges might include but are not limited to a conflict of interests, fear of loss of power over the process, fear about the relationship between secrecy and transparency, and operational aspects such as time consumption and other resources.

This opens the way for future research to address how companies can resolve these dilemmas in the best possible way. Some of our cases, such as the article by Koottatep et al., provide excellent illustrations for possible solutions. Typically, development of products or services is considered a complex process that requires the management of several factors at different stages, running from concept, through project design and testing to product launch and marketing. To ensure that principles of responsible innovations are considered, it is imperative to engage users and broader stakeholders in the process. In the article by Gojny-Zbierowska and Zbierowski, improvisation is suggested to increase innovative, proactive solutions that firms can offer into the market. That interesting take on process allows the organization to pivot and reflect on the needs of the market to ensure the best possible diffusion of innovations.

Although many good examples of firm practices were analyzed in this SI, there remain questions that need to be addressed in future research. Innovation can take many forms—for example product innovation (change in products/services offered by a company), process innovation (change in the way products/services are offered or presented to the consumer), the innovation of position (change in the context in which the products/services are introduced in the market) and paradigm innovation (change in the basic mental models that guide the actions of the company). This raises a question: how can stakeholder's participation contribute to innovation in these different forms? Who are the agents who might orchestrate stakeholder's participation?

The articles presented in this Issue describe the practical implementation of responsible innovation principles and add to the development of a coherent theory of responsible innovation. The breadth of the RI field can be clearly seen by a review provided by Gonzales-Gemio et al., where the authors provide an interesting and complex conceptual model of RI that includes firm performance as an outcome variable. Several other articles presented in this SI provides interesting extensions of the theory of responsible innovation into other fields. For example, the study by Fløysand et al. combines region innovation systems theory and RI theory, and the study by Gojny-Zbierowska and Zbierowski merges concepts of entrepreneurial orientation and responsible innovation. Such attempts bring new perspectives into the debate of responsibility. In this fashion, other established research areas (for example, strategic management, knowledge management, entrepreneurship domain, or the geography of innovation) might be beneficially used as lenses while debating responsible innovation and vice versa.

Although firms might try their best to behave responsibly, there are limits on what a single economic actor might implement. Thus, it is becoming important to focus on future research on the firm's practices and how a broader network and economic eco-system in regions or nations can become supportive of the responsible innovations. Regional and national initiatives can include developing organizational networks, clusters, and conglomerates, aiming to make user inclusiveness less time and resource-demanding for each economic actor. There may also be scope for innovation lab type environments enabling co-creation and facilitation of entry to the mainstream system. There is a need to look on enabling approaches—it might be a physical context, a toolkit or a framework methodology—through which stakeholders can be actively involved in the innovation process.

Future studies should consider the broader innovation environment—the specific networks of actors, the interactions and flows of knowledge between them, and the in-

stitutional settings these are embedded in, such the innovation eco-system [19]. Such an eco-system approach is a determining factor in innovation clusters emerging around digital platforms [20], providing specific conditions for possibilities and limitations to involve users, regional innovation clusters, or even due to particular structures and practices that have emerged around key innovation players. The eco-system approach might help provide a more robust framework within which different actors can explore ways to create and capture shared value.

References

1. Adner, R.; Kapoor, R. Innovation ecosystems and the pace of substitution: Re-examining technology S-curves. *Strat. Manag. J.* **2015**, *37*, 625–648. [CrossRef]
2. Blok, V.; Lemmens, P. The Emerging Concept of Responsible Innovation. Three Reasons Why It Is Questionable and Calls for a Radical Transformation of the Concept of Innovation. In *Responsible Innovation 2*; Springer: Berlin/Heidelberg, Germany, 2015; pp. 19–35.
3. Da Silva, L.M.; Bitencourt, C.C.; Faccin, K.; Iakovleva, T. The Role of Stakeholders in the Context of Responsible Innovation: A Meta-Synthesis. *Sustain. J. Rec.* **2019**, *11*, 1766. [CrossRef]
4. Iakovleva, T.; Oftedal, E.; Bessant, J. Responsible innovation as a catalyst of the firm innovation process. In *Responsible Innovation in Digital Health: Empowering the Patient*; Edward Elgar Publisher: Cheltenham, UK, 2019; pp. 9–22.
5. Koch, S.; Kerschbaum, M. Joining a smartphone ecosystem: Application developers' motivations and decision criteria. *Inf. Softw. Technol.* **2014**, *56*, 1423–1435. [CrossRef]
6. Kuhlmann, S.; Rip, A. Next-Generation Innovation Policy and Grand Challenges. *Sci. Public Policy* **2018**, *45*, 448–454. [CrossRef]
7. Laudal, T. Drivers and barriers of CSR and the size and internationalization of firms. *Soc. Responsib. J.* **2011**, *7*, 234–256. [CrossRef]
8. Leminen, S.; Nyström, A.G.; Westerlund, M.; Kortelainen, M.J. The effect of network structure on radical innovation in living labs. *J. Bus. Indust. Mark.* **2016**, *31*, 743–757. [CrossRef]
9. Lubberink, R.; Blok, V.; Van Ophem, J.; Omta, O. Lessons for Responsible Innovation in the Business Context: A Systematic Literature Review of Responsible, Social and Sustainable Innovation Practices. *Sustain. J. Rec.* **2017**, *9*, 721. [CrossRef]
10. Oftedal, E.M.; Foss, L.; Iakovleva, T. Responsible for Responsibility? A Study of Digital E-health Startups. *Sustain. J. Rec.* **2019**, *11*, 5433. [CrossRef]
11. Owen, R.; Bessant, J.; Heint, M. *Responsible Innovation: Managing the Responsible Emergence of Science and Innovation in Society*; John Wiley & Sons Ltd.: Hoboken, NJ, USA, 2013.
12. Owen, R.; Macnaghten, P.; Stilgoe, J. Responsible research and innovation: From science in society to science for society, with society. *Sci. Public Policy* **2012**, *39*, 751–760. [CrossRef]
13. Ribeiro, B.E.; Smith, R.D.J.; Millar, K. A Mobilising Concept? Unpacking Academic Representations of Responsible Research and Innovation. *Sci. Eng. Ethic* **2017**, *23*, 81–103. [CrossRef] [PubMed]
14. Rivard, L.; Lehoux, P.; Miller, F.A. Double burden or single duty to care? Health innovators' perspectives on environmental considerations in health innovation design. *BMJ Innov.* **2019**, *6*, 4–9. [CrossRef]
15. Silva, H.P.; Lehoux, P.; Miller, F.A.; Denis, J.-L. Introducing responsible innovation in health: A policy-oriented framework. *Health Res. Policy Syst.* **2018**, *16*, 1–13. [CrossRef]
16. Silva, H.P.; Lefebvre, A.A.; Oliveira, R.R.; Lehoux, P. Fostering Responsible Innovation in Health: An Evidence Informed Assessment Tool for Innovation Stakeholders. *Int. J. Health Policy Manag.* **2020**, *10*, 181–191.

17. Stahl, B.C.; Coeckelbergh, M. Ethics of healthcare robotics: Towards responsible research and innovation. *Robot. Auton. Syst.* **2016**, *86*, 152–161. [CrossRef]
18. Thapa, R.K.; Iakovleva, T.; Foss, L. Responsible research and innovation: A systematic review of the literature and its applications to regional studies. *Eur. Plan. Stud.* **2019**, *27*, 2470–2490. [CrossRef]
19. Wickson, F.; Forsberg, E.-M. Standardising Responsibility? The Significance of Interstitial Spaces. *Sci. Eng. Ethic* **2014**, *21*, 1159–1180. [CrossRef] [PubMed]
20. Von Schomberg, R. A Vision of Responsible Research and Innovation. In *Responsible Innovation*; Wiley: Hoboken, NJ, USA, 2013; pp. 51–74.