Chapter 1
Introduction

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Abstract The concept of Responsible Research and Innovation (RRI) originates in discourses on emerging technologies and research ethics in contested innovative fields, such as nanotechnologies or geo-engineering, and has been predominantly driven by European research and innovation policy over the past 10 years. The concept was initially developed and introduced by policy makers and social scientists, but recent studies have aimed to shed light on the implementation of responsible research and innovation practices in business. The contributions collected in this book are a result of work conducted by seven partner organisations in the European funded Horizon 2020 project "COMPASS – Evidence and opportunities for responsible innovation in SMEs". In combination, they illustrate that responsible innovation (RI) has been emerging as a new field in the ongoing discourse on the role and responsibility of business in society.

Keywords Responsible innovation · RRI · RRI introduction · Responsible business · COMPASS project

1.1 A Brief Introduction to Responsible (Research and) Innovation

The concept of Responsible Research and Innovation (RRI) originates in discourses on emerging technologies and research ethics in contested innovative fields, such as nanotechnologies or geo-engineering, and has been predominantly driven by European research and innovation policy since 2011 (Owen et al. 2012). A first working definition of RRI was proposed by von Schomberg (2011: 9) as:

> "[a] *transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and*

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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)".

After a period of debate about the definition of RRI (Stilgoe et al. 2013) and the concept's continuous development (Blok and Lemmens 2015), a common, general agreement about the meaning and key aspects of RRI has developed in the form of the four dimensions of anticipation, reflection, inclusion/deliberation and responsiveness (Stahl et al. 2017). Integration of these four dimensions in research and innovation processes should lead towards more responsible innovation output (Owen et al. 2012, 2013; Stilgoe et al. 2013). At the same time, the European Commission has been promoting RRI by funding projects on the thematic elements of ethics, gender and diversity, public engagement, open access, and science education through the previous and current European Framework Programmes for Research and Innovation, "FP7" and "Horizon 2020". For the upcoming Framework Programme "Horizon Europe" (2021–2027), the European Commission proposes that the programme "[…] should engage and involve citizens and civil society organisations in co-designing and co-creating responsible research and innovation agendas and content, promoting science education, making scientific knowledge publicly accessible, and facilitating participation by citizens and civil society organisations in its activities."; both across the programme and through dedicated activities (European Commission 2018: para 26). It remains to be seen to what extent the different elements of the RRI concept as described above, and its basic aim to increase positive societal impact and minimize potential risks for individuals, the society and the natural environment will be implemented in the Horizon Europe programme and in the research and innovation projects it funds.

The RRI concept was initially developed and introduced by policy makers and social scientists (Lubberink et al. 2017), but recent studies have aimed to shed light on the implementation of RRI practices in business. These studies indicate that businesses in Europe still seem to be operating without an awareness of the concept itself (Blok and Lemmens 2015; Davies and Horst 2015; Khan et al. 2016), but that extant practices, processes and purposes exhibit indications of responsible innovation (Asante et al. 2014). Moreover, a growing body of literature has been dealing with questions of how to incentivise or drive companies to adopt either the concept (Auer and Jarmai 2018; Gurzawska et al. 2017; Chatfield et al. 2017), or particular responsible innovation principles (Iatridis and Kesidou 2018; Iatridis and Schroeder 2016). First good practice examples of implementation of RRI in business provide a diverse set of company practices; ranging from inclusive governance and a general orientation of company research and innovation towards tackling societal challenges, through institutionalized opportunities for anticipation and reflection, to targeted activities aimed at increasing gender balance or fostering science education (Schroeder 2014, 2017).

The discourse about embedding responsibility in corporate innovation processes has evolved from aiming to implement the RRI concept, as defined by European Commission, to linking it to extant responsibility concepts such as Corporate Social Responsibility (CSR) or tangible company practices throughout the innovation

process. In the course of these developments, the use of the simpler term "responsible innovation" (RI) has emerged, which has been used synonymously with the abbreviation "RRI". The term responsible innovation is more common in communities that deal with responsibility in corporate innovation processes but are not directly influenced by the European Commission's Research Programmes. This is reflected, for example, by the launch of a Special Interest Group for Responsible Innovation by the International Society for Professional Innovation Management (ISPIM)[1], the foundation of the "Virtual Institute for Responsible Innovation"[2] hosted by the Center for Nanotechnology in Society at Arizona State University in the US and, last but not least, the title of the first academic journal concentrating on the assessment and governance of innovation, namely the Journal of Responsible Innovation[3].

1.2 Business Opportunities Through Responsible Innovation? A Response in Six Chapters

The contributions collected in this book are the results of work conducted by seven partner organisations in the European funded Horizon 2020 project "COMPASS"[4]. The overall objective of the project was to develop tools to support Small and Medium-Sized Enterprises (SMEs) in the implementation of RI. Main project outputs include an online self-check tool that allows companies to find out what they already do that qualifies as RI and what other actions they can take, a methodology to develop a company-specific action plan for RI, and sector-tailored roadmaps for companies working with nanotechnologies, in cyber security, or in biomedicine. In the process of co-developing these tools together with companies, sector experts, funding organisations and civil society representatives, the members of the project consortium used their expertise to support companies that were looking for ways to increase their positive impact on society while at the same time aiming to discover the benefits of applying RI principles that are measurable in terms of revenue.

This book is tailored towards the interests of innovation managers, entrepreneurs and academics. For innovation managers and entrepreneurs, it will provide inspiration and ideas about what RI can look like in practice and what the possible benefits might be. For readers with an academic interest, it offers discussion of potential company incentives for RI and suggestions as to how to communicate its essence to companies in a useful and comprehensive way. In Chap. 2, Jarmai and colleagues tackle the challenge of embedding the responsible innovation concept in a business context and suggest a five step strategy on how a company can engage with RI. In Chaps. 3 and 4, Jarmai and Antoniou, respectively, connect RI to sustainability-

[1] https://www.ispim-innovation.com/responsible-innovation

[2] https://cns.asu.edu/viri

[3] https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=tjri20

[4] https://innovation-compass.eu/

oriented innovation and social innovation to illustrate what responsible innovation can learn from connecting with these two approaches, which are better established in a business context. In Chap. 5, Schroeder presents real-life case studies of companies that have implemented RI practices, and discusses reported benefits. In Chap. 6, Flick and colleagues give a first-hand account of challenges and successful strategies for co-creating RI strategies with companies. In the concluding Chap. 7, Schönherr and colleagues summarise the most important lessons learned from the contributions in this volume, and develop the outlines of a business case for responsible innovation.

In combination, the chapters in this volume illustrate that responsible innovation is emerging as a new field in the continuing discourse on the role and responsibility of business in society. Success in economic terms cannot be guaranteed, but the willingness of an SME to innovate in areas that have positive societal impact in addition to profits can bring business benefits and add additional value such as higher employee satisfaction, retention of skilled personnel or reputational gains.

References

Asante, K., Owen, R., & Williamson, G. (2014). Governance of new product development and perceptions of responsible innovation in the financial sector: insights from an ethnographic case study. *Journal of Responsible Innovation, 1*(1), 9–30.

Auer, A., & Jarmai, K. (2018). Implementing responsible research and innovation practices in SMEs: Insights into drivers and barriers from the Austrian medical device sector. *Sustainability, 10*(1), 17.

Blok, V., & Lemmens, P. (2015). The emerging concept of responsible innovation. Three reasons why it is questionable and calls for a radical transformation of the concept of innovation. In B.-J. Koops, I. Oosterlaken, H. Romijn, T. Swierstra, & J. van den Hoven (Eds.), *Responsible innovation 2: Concepts, approaches, and applications* (pp. 19–35). Cham: Springer.

Chatfield, K., Iatridis, K., Stahl, B. C., & Paspallis, N. (2017). Innovating responsibly in ICT for ageing: Drivers, obstacles and implementation. *Sustainability, 9*(6), 971.

Davies, S. R., & Horst, M. (2015). Responsible innovation in the US, UK and Denmark: Governance landscapes. In B.-J. Koops, I. Oosterlaken, H. Romijn, T. Swierstra, & J. van den Hoven (Eds.), *Responsible innovation 2: Concepts, approaches, and applications* (pp. 37–56). Cham: Springer.

European Commission. (2018). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination. COM(2018) 435 final. https://eur-lex.europa.eu/resource.html?uri=cellar:b8518ec6-6a2f-11e8-9483-01aa75ed71a1.0001.03/DOC_1&format=PDF. Accessed 18 Dec 2018.

Gurzawska, A., Mäkinen, M., & Brey, P. (2017). Implementation of responsible research and innovation (RRI) practices in Industry: Providing the right incentives. *Sustainability, 9*, 1759.

Iatridis, K., & Kesidou, E. (2018). What drives substantive versus symbolic implementation of ISO 14001 in a time of economic crisis? Insights from Greek manufacturing companies. *Journal of Business Ethics, 148*(4), 859–877.

Iatridis, K., & Schroeder, D. (2016). *Responsible research and innovation in Industry. The case for corporate responsibility tools*. Heidelberg: Springer.

Khan, S. S., Timotijevic, L., Newton, R., Coutinho, D., Llerena, J. L., Ortega, S., Benighaus, L., Hofmaier, C., Xhaferri, Z., de Boer, A., Urban, C., Strähle, M., Da Pos, L., Neresini, F., Raats, M. M., & Hadwiger, K. (2016). The framing of innovation among European research funding actors: Assessing the potential for 'responsible research and innovation' in the food and health domain. *Food Policy, 62*, 78–87.

Lubberink, R., Blok, V., van Ophem, J., & Omta, O. (2017). Lessons for responsible innovation in the business context: A systematic literature review of responsible, social and sustainable innovation practices. *Sustainability, 9*(5), 721.

Owen, R., Macnaghten, P., & Stilgoe, J. (2012). Responsible research and innovation: From science in society to science for society, with society. *Science and Public Policy, 39*(6), 751–760.

Owen, R., Stilgoe, J., Macnaghten, P., Gorman, M., Fisher, E., & Guston, D. (2013). A framework for responsible innovation. In R. Owen, J. Bessant, & M. Heintz (Eds.), *Responsible innovation, managing the responsible emergence of science and innovation in society* (pp. 51–74). Chichester: Wiley.

Schroeder, D. (2014). *D1.2 Case study descriptions. Deliverable of the FP7 project RESPONSIBLE-INDUSTRY*. http://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxyZXNwb25zaWJsZWluZHVzdHJ5d2Vic2l0ZXxneDoyZjdkYmZkNWJmMzVhYzkx

Schroeder, D. (2017). *D1.2 case study descriptions*. Deliverable of the Horizon 2020 project COMPASS. https://innovation-compass.eu/wp-content/uploads/2017/07/Deliverable-1_3-Compass-Case-Study-Descriptions.pdf. Accessed 20 Sept 2018.

Stahl, B., Obach, M., Yaghmaei, E., Ikonen, V., Chatfield, K., & Brem, A. (2017). The responsible research and innovation (RRI) maturity model: Linking theory and practice. *Sustainability, 9*(6), 1036.

Stilgoe, J., Owen, R., & Macnaghten, P. (2013). Developing a framework for responsible innovation. *Research Policy, 42*(9), 1568–1580.

von Schomberg, R. (2011). *Towards responsible research and innovation in the information and communication technologies and security technologies fields*. Directorate general for research and innovation. https://doi.org/10.2139/ssrn.2436399.