

PRISMA

D3.3 Lessons from the pilots

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List of abbreviations

< PRISMA >	< Piloting RRI in Industry: a roadmap for tranSforMAtive technologies >
< CSR >	< Corporate Social Responsibility >
< CEO >	<Chief Executive Officer >
< RRI >	< Responsible Research and Innovation >
< SME >	< Small or Medium-sized Enterprise >
< KPI >	< Key Performance Indicators >
< R&D >	< Research and development >
< WP >	< Work Package>
< PPP >	< Public-Private Partnerships >

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1 Introduction

In this deliverable, we draw lessons about drivers and barriers for RRI from our pilot studies. These lessons are based on a reflection on other PRISMA deliverables, in particular D2.4 (outcomes of the pilots), D3.1 (the RRI KPIs for the pilots) and D3.2 (comparative analysis of the eight pilots). Also insights from the roadmap for RRI that we developed (D5.1 and D5.2) were used.

Since PRISMA is Coordination and Support Action, rather than a research and innovation action, research is strictly speaking not part of the PRISMA project. Consequently, the lessons are more lessons from practice than based on a strict research design with a predefined research question and research design. Rather than following a strict methodology, we reflected on what we learned from the pilots, and report these lessons in this deliverable. Still, our pilots are one of the still sparse experience with RRI in industry and therefore worth drawing some lessons from.

In this deliverable, we also present a reflection on RRI strategies and tools, and we formulate some recommendations for the future implementation of RRI in industry.

2 RRI drivers and barriers¹

2.1 RRI drivers

The drivers for RRI in industry we encountered in the PRISMA project can be categorized in three main categories::

1. **The willingness to do good**

In several of the pilots, people in the pilot companies expressed that they saw RRI as a way to do good. Also, the personal values of the CEO and/or others in company sometimes were a clear motivation to engage in the RRI pilots. In this respect, it is also useful to connect RRI to CSR (Corporate Social Responsibility), a

¹ See also Deliverable 5.1, in particular the SWOT analysis on page 21

concept known by most companies. Many companies already have a CSR policy and it may be useful to present RRI as CSR for the innovation process.

2. License to operate

The “license to operate” refers not only to the formal permission (by a regulatory body) of the operations of the company but rather to a general acceptance and a perceived (moral) acceptability of the company and its products (Nielsen, 2013). It thus contributes to trust in the company and a perceived legitimacy of company operations. This is in the interest of the company not only because it may prevent (additional) government regulation but also because it contributes to acceptance of the company and its products not only by its clients but also by other stakeholders and the public.

3. Commercial gain

Some of the pilot companies saw RRI not only as an opportunity to do good or to contribute to the company’s license to operate, but also as potentially commercially attractive. For example, in one of the pilots, better cleaning in hospitals using the potential of IoT was seen as addressing a societal challenge, but also as offering a business opportunity for the company. In fact, the motivating factor was the potential for improved corporate image or profile. This is associated with increased profits, as it may provide a competitive edge. More generally, Porter and Kramer (2006) have argued that social responsibility should be connected to corporate strategy to be effective and to be beneficial for both the company and society. Their argument is made for CSR but it applies equally to RRI (van de Poel et al., 2017).

2.2 RRI barriers and challenges

In implementing RRI and in particular in starting up the 8 pilots, we witnessed two perceptions that made it more difficult to implement RRI (or to interests companies for a pilot):

1. Unclear added value of RRI.

Most companies have not yet heard of RRI. Companies that have heard or know RRI often perceive the language accompanying it as academic, abstract and full of jargon (Dreyer et al., 2017). Moreover, the (claimed) benefits of RRI are not so clear to companies. In the PRISMA, we did a number of things to overcome this challenge. We produced a leaflet explaining RRI in accessible language and what the advantages of RRI would be. We used this leaflet also to interest companies for our pilots; it therefore also contained an explanation of what it meant to engage in one of the PRISMA pilot. We further found that it might be helpful to connect RRI to CSR in explaining it to companies (RRI as CSR for the innovation process) and to connect to values (see below).

2. Tension with commercial interests.

RRI may be perceived as being at tension with the commercial interests of companies. An important way to counter this perception may be to point out that RRI may contribute to a company’s license to operate and to commercial interests as explained above under RRI drivers. Still, there may also be some real tension with commercial interests that we will discuss below under barriers.

The barriers for RRI uptake in industry that we witnessed in the PRISMA project can be summarized under the following headings:

1. Lack of resources and capacities for RRI

Obviously RRI requires both resources (financial, time) as well as specific expertise (see also van de Poel et al., 2017). We witnessed that particularly smaller companies felt that they have limited resources to spend on RRI. They also typically lack the expertise that is required for RRI. This means that the pilot companies needed to rely on the PRISMA partners to bring in the various kinds of required expertise. While the pilot companies were willing to engage in RRI initiatives with the help of PRISMA partners, it may be doubted whether they would also do so on their own. In fact the tension for these companies is the challenge of how to balance the need to achieve financial profit with the resources needed to conduct their activities in a responsible manner.

2. Limited influence of single companies

In the pilots we witnessed that in particular smaller companies feel that they have a limited influence, in particular when they are part of a long value chain. Indeed, in such circumstances companies alone cannot make the difference and more collective or institutionalized RRI efforts may be required, for example at the level of a branch or industry sector.

3. Innovation is crucial for many companies to gain a competitive edge

Innovation is often key to a companies' competitive strategy vis-a-vis other companies (although there are big differences between different sectors here (Pavitt, 1984; van de Poel et al., 2017)). This, on the one hand, offers companies the opportunity to connect RRI to corporate strategy and identity. At the same, it makes innovation an area in which companies want to be in control (which may be at tension with for example stakeholder involvement) and the strategic importance of innovation may also mean that the company does not want to fully reveal its innovation strategy to outsiders, which may make RRI more difficult to implement.

4. Lack of level playing field

Although there may be opportunities for RRI to contribute to corporate strategy and to create a competitive edge, there are also clearly situations in which acting more responsibly than competitors is commercially not attractive for companies (van de Poel et al., 2017). In such cases, there may be a need to create a level playing field with respect to RRI, i.e. a situation in which all companies are somehow expected, or even forced, to meet some minimal standards of responsible conduct. This may be done by government regulation, but there have also been attempts to create a level playing field through a voluntary code for an entire industry; an example of the latter is Responsible Care in the chemical industry (Moffet, Bregha, & Middelkoop, 2004).

3 Reflection on RRI strategies and tools

Here we reflect on the most salient experiences we gathered with respect to RRI strategies and tools. We group these under the following headings:

- Stakeholder engagement
- Broadening (current) assessment
- Identifying value tensions
- Lead users and experimentation

- Building trust and legitimation
- RRI monitoring

3.1 Stakeholder engagement

In the RRI literature, stakeholder involvement is usually considered a crucial element of RRI (e.g. Owen, Bessant, & Heintz, 2013). What is particularly important for RRI is that stakeholder involvement already starts during the early stages of innovation (and not after a product has been brought onto the market) and that it is organized in such a way that it can impact the Research & Development (R&D) process.

In all pilots, attempts at improving stakeholder engagement were made, but with different degrees of success. A critical evaluation of the pilots (as described in D2.4) shows the following barriers to successful stakeholder engagement:

- Companies may lack the resources, financially as well as organizationally, to organize stakeholder involvement. Seriously engaging stakeholders from early on requires quite some organizational efforts and can come with considerable financial costs for a company. In particular, for smaller companies the investments required might be too constraining. In such cases, stakeholder engagement can perhaps better be organized at the level of, for example, branch organizations rather than at that of individual companies.
- Stakeholders may not be interested or motivated to engage in stakeholder involvement. In particular, early on in the innovation process, it may be unclear what is at stake with a proposed innovation. This may not only make it difficult to identify potential stakeholders, also potential stakeholders may feel that there is too little at stake (for them) to engage in a stakeholder discussion. They may for example expect an innovation to be unproblematic, or they may (still) have little interest in an innovation, because they do not see the need to innovate.² Something of the latter happened in one of the pilots, where it turned out to be impossible to interest a hospital (and related stakeholders) in a workshop.
- Another barrier is that commercial interests may make it more difficult to engage stakeholders, for example because certain information is sensitive or to be kept secret for commercial reasons³, which may hinder an open stakeholder dialogue. Also, if companies want to acquire a patent or intellectual property rights, it may be impossible to share certain information with stakeholders.
- A final reason that surfaced is that the relation with certain stakeholders is sometimes so sensitive or that a relation of trust is lacking, that engagement with these particular stakeholders becomes practically impossible or unproductive. For example, in one pilot the company felt that the public criticism voiced by some NGOs towards the kind of product they work on was so misguided, strong and resolute, that an open stakeholder dialogue with such parties would be virtually impossible.

² Of course, this could also be an indication that engagement is already too *late* or wrongly focused. That is to say, RRI is also about developing societally beneficial innovations that meet societal needs. If there is no interest, this might be an indication of a lack of (experienced) needs that are met with the innovation at issue.

³ This does not just concern cases in which IPR (intellectual property rights) or patents are at stake. In fact, in cases in which companies do not (aim to) acquire IPRs or patents, keeping an innovation secret may even be more important to stay ahead of competitors than in cases in which companies acquire a patent.

3.2 Broadening assessment

In most pilots, some form of technology assessment – implicitly or explicitly – already took place. This can be risk assessments (sometimes also required by law), environmental assessment or some other form of technology or impact assessment. Even if no formal assessments are part of the regular process of a company, in many cases informal assessments or forecasts – for example in the form of expectations – were in place.

This means that in many cases, RRI in companies can build on existing activities in companies. The added value of RRI in such circumstances is not to introduce assessment as such, but rather to broaden the current scope of technology assessments, particularly in the following, related senses:

- Currently, assessment is often limited to commercial or legal risks and liabilities, or to safety, health and sustainability issues, and/or issues for which some form of assessment is required by law. In the light of RRI, such assessment can be broadened to include impacts on other value dimensions (like privacy, fairness, or equality, to name some) or related to broader societal issues. In light of the recourses and expertise required for such assessment, the question can be asked whether such broader assessments should probably be done at the branch level rather than by the individual company.
- Assessments, in particular more formal ones, may often only be done to show that firms meet regulatory requirements, rather than using insights from assessment to improve the company's innovations. For example, in one of the pilot projects, life cycle analysis (LCA) was done at the end of product development and an RRI opportunity would be to move such analysis more upfront so that it can inform innovation and product development.
- Assessments can also be broadened by including (more) outsider perspectives in the assessment. This might be done by organizing a stakeholder dialogue, but even if such stakeholder engagements turn out to be difficult (see previous point), it may be worthwhile to include outsider perspectives in assessment content-wise. This will often improve the quality of the assessment and may prevent unpleasant surprises when products are brought onto the market.

3.3 Identifying value tensions

The language of RRI is not (yet) familiar in industry. Rather, RRI language is perceived as academic and full of jargon (Dreyer et al., 2017). Therefore, in order to successfully implement RRI in industry, language is needed that does justice to the ideas behind RRI but that communicates better than many of the current RRI frameworks. One candidate here would be the terminology of 'values.' Values denote things that are good and worth striving for.⁴ Examples are safety, sustainability, integrity, openness and fairness. Companies often use values not only in their Corporate Social Responsibility (CSR) policies, but also in their mission statements or in their corporate strategy. For these reasons, the language of values seems to resonate well with companies and seems an opportunity to connect RRI to CSR and corporate strategy. Values also have the communicative advantage that they denote what is positive and desirable rather than what might go wrong or is risky.

⁴ RRI is in a sense prescriptive on what values should matter to companies – democracy, inclusivity, morality, sustainability, openness, transparency, etc. Our plea for a language of values should not be read as implying that any values would do. On the contrary, it should be taken to imply that some values cannot be neglected from a normative (or moral) point of view. The points here is mainly about communication.

One way to better realize RRI activities in companies is to draw attention to value tensions, i.e. to values that are at tension with each other in innovation because they cannot be both realized at the same time. In several of the pilots, we witnessed indeed such value tensions. Identifying value tensions, then, seems to be a practically feasible way to engage companies in RRI. From an RRI perspective, one would want to require that companies become aware of value tensions both in their normal operations as well as in their innovation processes. In many cases, there may be disagreement about how value tensions should be dealt with (or resolved) and/or there may not be one obviously best way to address them (van de Poel, 2015). Nevertheless, from an RRI perspective, one would minimally expect companies to be transparent and accountable for how they choose to deal with value tensions and why they did so. It might in fact also have advantages for companies not only to accept accountability for how value tensions are dealt with but, also to actively communicate how they deal with value tensions. Such communication might also contribute to the corporate image of a company and so help its business strategy.

3.4 Lead users and experimentation

Companies are sometimes reluctant to introduce innovative technologies because they are unsure of the reactions of the public and other stakeholders. This uncertainty may result in so-called waiting games (Robinson, Le Masson, & Weil, 2012). For example, in one of the pilots, uncertainty about public expectations and particularly about (future) regulatory frameworks hindered the introduction of new applications. This was partly due to the fact that the current regulatory framework was not fit for the new technology, or outright forbade certain applications. In such cases, new regulatory frameworks or new standards may be required to successfully and responsibly introduce new technology. However, without experience with the new technology, also regulatory bodies or governments may be reluctant to take a step.

To break through such impasses, mechanisms are needed to gain experience with the new technology and to reduce uncertainty. An important way in which this can be done is by finding lead users for new innovative technologies and to engage in different forms of (small-scale) niche experimentation (Kemp, Schot, & Hoogma, 1998). Such initiatives also offer a potential for RRI. Experimentation by lead users, for example in living labs or regulation-free zones, not only offer a possibility to learn about the technology but also about how stakeholders react to a technology and potential ethical issues raised by a technology. Experimentation, in other words, is not only technical but also institutional and moral practices (Van de Poel, 2018). RRI then can (and should) be part of such experimentation from the start and small-scale experimentation may teach those involved more and less successful ways of addressing RRI issues for a specific technology or application.

3.5 Building trust and legitimacy

In particular for some new emerging technologies that raise societal concern or even controversy, gaining trust and legitimacy is often considered an important aim by companies. An example is synthetic biology, a technology that raises a range of societal concerns (see also D2.4). In one of the pilots, the company felt that at least some of the concerns are misperceived, or are already properly addressed. At the same time, it may be clear that without public and stakeholder trust, such a message will be very hard to communicate.

In general, RRI may contribute to building trust and legitimacy. It does so by, amongst other things, involving stakeholders and ensuring that innovation meets a range of procedural criteria (like accountability, responsiveness, and anticipation) and respects a range of more

substantive values (like sustainability, fairness, and safety). This means that RRI strategies may be attractive for companies to help build trust and legitimation for their innovations.

From an RRI perspective, trust should be more than an attractive instrument for companies to get their innovations accepted. Rather, trust is needed for deliberation and reflection on the desirability of an innovation and what considerations to take into account in the R&D and innovation process. Obviously, this requires not just consumers, NGOs and the public to trust companies, but also requires that companies are willing to trust these other stakeholders. Proper RRI in this sense requires a situation of mutual trust between all parties involved. One of the things we witnessed is that in some cases, such trust is very hard if not impossible to build (see the Evolva case in D2.4).

There seem to be two more general reasons why trust is so hard to create in this type of situations.

One is that if one starts making RRI attempts in a situation of mutual distrust, RRI - rather than being part of the solution - may become part of the conflict. NGOs that oppose a technology may perceive the RRI strategy of a company as a strategic move to gain public trust rather than as a genuine effort. Companies, on the other hand, may be reluctant to become more open and inclusive, as RRI would require, because they may fear that will fuel the controversy and offer additional opportunities to criticize them to already opposing NGOs. One thing we experienced, then, is that experimenting with RRI in company pilots may be more difficult for controversial technologies, even if it could be argued that RRI is most needed for such technologies.

Another important caveat has to do with the nature of trust. Trust is something that is difficult to earn and easy to lose. Moreover, trust is essentially a by-product of (normal) interactions between parties. If we ask somebody to trust us, the effect may well be counterproductive. Such a message on the hand seems to diagnose the current situation as one of distrust (which need not be productive in building trust). Moreover, it may give the false impression that trust can be delivered at will, while it is something that has to grow and to be gained. If trust is indeed a by-product, strategies that deliberately and explicitly aim at trust may not only misfire, but even be counterproductive.

The above does not imply that RRI cannot contribute to building trust. It merely means that one should be careful with formulating trust as an explicit goal of RRI activities, because doing so may create the impression that RRI is merely done for strategic or instrumental reasons, so eroding rather than building trust.

3.6 RRI monitoring

Another important way in which RRI in companies may be stimulated and implemented is through monitoring of RRI performance. Within the PRISMA project we have developed a tool that helps companies to formulate Key Performance Indicators (KPIs) that may be useful to this end. This is described in detail in D3.1.

Formulating KPIs may stimulate and help companies to think about what they want to achieve with RRI, and subsequently to monitor whether their RRI activities indeed help to achieve such objectives. This also allows an adaptation or reformulating of the company's RRI strategy and activities if appropriate.

One broader question here is whether such RRI monitoring should be done by the company itself or should include some form of external auditing. Both would seem to have their advantages and disadvantages. Internal monitoring may be more easy to implement and less sensitive for a company; moreover, as the company takes the initiative itself it may be more open to learn from experiences. On the other hand, only internal monitoring may raise

doubts in the outside world whether RRI activities are merely a form of windows-dressing or whether there is a real commitment to RRI.

This is underlined by the experiences with *Responsible Care*, a voluntary self-regulatory code for the chemical industry (Givel, 2007; King & Lenox, 2000; Moffet et al., 2004). Responsible Care aims at improving the environmental and safety performance of the chemical industry, also in innovation; it is therefore an early example of *de facto* RRI. However, it has also been criticized as an attempt to postpone government regulation (Givel, 2007). One of the lessons is that it is important to have some form of external auditing to check whether companies indeed live up to voluntary self-regulatory codes (King & Lenox, 2000; Moffet et al., 2004). Nevertheless, voluntary internal monitoring might be a useful first step, also to gain experience with the RRI KPI tool and to further improve it. In relation to the above, also the issue of standardisation is relevant. In the PRISMA project, we took the initiative to further develop the PRISMA RRI road-mapping methodology (see deliverable 5.2) as a EU-based consensus document acknowledged by the European Committee for Standardization (CEN).

3.7 Conclusions on RRI strategies and activities

We have discussed several RRI strategies that emerge from our PRISMA pilots and that may be more generally applicable. The main lesson, however, is the importance of attuning RRI strategies to the specific needs of the company, instead of providing “one size fits all” tools and strategies. This does not mean that general methodologies are not possible or that common indicators for RRI are not possible, but rather that they should be so devised that they can be adapted to the specific company or context.

In particular, it would seem important to pay attention to three types of differences between companies, namely: 1) differences in types of products and services and in underlying technologies (because different technological domains, and different applications raise different types of RRI issues), 2) differences in resources and expertise (with respect to RRI) in companies. (There are not only large differences between small and large companies in this respect, but also between different companies of the same size.) 3) different companies follow different business strategies, which may create different opportunities (and constraints) for RRI.

The roadmap methodology that we develop in PRISMA (see deliverables 5.1 and 5.2) is particularly apt for dealing with differences between companies as it allows companies to develop a tailor-made RRI strategy that is attuned to the specific challenges, resources, expertise, commitments etc. of a company. Also the approach for developing RRI KPIs (deliverable 3.1) allows finetuning such KPIs to the company.

4 Recommendations

On basis of the experiences that we have gathered in the PRISMA project, we make three recommendations for the further process of implementing RRI in an industry context. In addition, we recommend to do further research on RRI in industry, in order to come to better insights.

1. Continued Experimentation with RRI in industry

One recommendation is to further experiment with RRI in an industry context. The PRISMA project (and similar EU projects) have delivered useful experiences with and insights into implementing RRI in industry. They have led to the identification of drivers and barriers for RRI industry and to concrete tools and strategies, like in the PRISMA project the RRI KPIs

(D3.1) and the Roadmap methodology (D5.2). At the same time it is clear that the road to broad adoption of RRI in industry is still long. Continued experimentation with RRI in industry is therefore essential to gain more experience and to overcome some of the current challenges and barriers. If our observation is right that RRI in industry cannot be implemented by one-size-fits-all tools, this also implies that companies need to go through their own experimental and learning process in implementing RRI. Such continued experimentation would also need some form of external funding, at least to provide companies with the external support and expertise to experiment with RRI.

2. Cooperative efforts

The PRISMA project deliberately focused on implementing RRI in individual companies, as there was little experience with that. This has led to useful new experiences and insights. Still, in order to implement RRI more widely in industry, in particular for smaller companies more cooperative or collective RRI efforts are key. There are two main reasons for this. One is the limited resources and expertise on RRI within individual companies; cooperation or more collective efforts at the branch level could be helpful here. Second, some RRI issues are technology- or sector-specific rather than company-specific. Moreover, addressing them might require efforts at the branch level or the level of the entire value chain.

The above should not conceal that there are also good reasons to continue at the same time with a focus on individual companies when it comes to implementing RRI. First, for large companies, the mentioned reasons for more cooperative efforts may not be apply. They may be large enough to collect the required resources and expertise. Moreover, they may alone have enough influence to set new trends. Second, as we have seen one of the drivers for RRI in industry is to connect to it corporate strategy, and innovation is often key for a company to gain competitive advantage. Obviously, this is at tension with more collaborative RRI efforts.

Future efforts should, then, both be directed at the level of individual companies, as well at the level of industry branches and value chains. These different levels may require different RRI tools and strategies.

3. RRI support

As we have seen, companies usually lack RRI expertise. Therefore, there is a need for RRI support. We therefore recommend to develop and experiment with new institutional forms of RRI support and consultancy. In particular, we want to suggest four possible institutional forms -- although our list should not be seen as limiting:

- RRI in public-private partnerships
- RRI consultancy firms
- Branch organizations and CSR organizations
- Embedded ethicists

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