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Responsible innovation in venture creation and firm development: the case of digital innovation in healthcare and welfare services

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ABSTRACT

The increasing adaptation of digitalisation has engendered numerous venture ideas and entrepreneurial opportunities. Many of these ideas bear the potential to address grand societal challenges. However, perceived opportunities can be elusive, especially in the context of complex problems. Opportunity confidence (OC) can be essential to venture creation and firm development. OC depends on evaluating socioeconomic, socio-ethical, and socioecological factors, which are not straightforward. Responsible innovation (RI) can be a viable approach to building OC. However, whether or how firms and entrepreneurs pursue RI to build OC needs to be clarified. Accordingly, we explore these issues through a case study of nine for-profit firms in digital healthcare and welfare services. The findings reveal that although the firms do not integrate RI principles in innovation and entrepreneurial activities per se, they practice them to varying degrees. This helps them to build OC. The study contributes to theory, practice, and policy.

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Responsible innovation; venture creation; firm development; entrepreneurship; opportunity confidence

Introduction

Responsible innovation (RI) has become a hot topic on political, industrial, and academic agendas. Broadly, it refers to the governance of innovation and entrepreneurship that aligns with stakeholders' and society's needs, values, and expectations and as a way to make sure science, technology, and innovation address the major societal challenges (von Schomberg 2013). While this has dominated the policy discourse, including innovation policies (Fitjar, Benneworth, and Asheim 2019), it also applies to innovation and entrepreneurial activities. These activities can be impactful if entrepreneurs and firms are responsive to stakeholders' concerns, needs, values and expectations (Owen, Macnaghten, and Stilgoe 2012; von Schomberg 2013; Wickson and Carew 2014). Also, the RI discourse argues that public deliberation and responsiveness must be prioritised to deal with 'questions of uncertainty, motivations, social and political constitutions, trajectories and directions of innovation' (Stilgoe, Owen, and Macnaghten 2013, 1570). Areas

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for consideration include the anticipated positive and negative impacts of innovations, the societal and ethical dimensions of technological development and the inclusion of diverse stakeholders in the innovation and entrepreneurship processes (Owen 2014; Ribeiro, Smith, and Millar 2017).

Recognising the value of stakeholder inclusion in the product-development process, the application of RI in firms is often a process of governance with a strongly normative loading. Still, clear and practical guidelines for implementing it are lacking (Lubberink et al. 2017). Similarly, theoretical studies have focused on normative models of RI, and relatively few empirical studies of RI in practice in corporate settings exist (Owen and Pansera 2019; Timmermans et al. 2020). (See also Asante, Owen, and Williamson 2014 Journal of Responsible Innovation article of RI in financial services as an example) (Asante, Owen, and Williamson 2014). Thus, despite nearly a decade of study of RI in industry, its influence in business communities is still far from being fully understood. One of the reasons van de Poel and colleagues (Poel et al. 2020) indicated in their study was that companies struggle to understand the value of their investment in RI. As such, the companies do not fully appreciate how the adoption and practice of RI in innovation and entrepreneurship can enhance their goals and objectives (Poel et al. 2020). Firms could be motivated to adopt and practice RI if they see the benefits of implementing RI in enterprises.

Related to the discourse on RI, there are growing public concerns about the underlying motivations for using digital technologies in healthcare and welfare services (Owen, Bessant, and Heintz 2013; von Schomberg 2011). Arguably, the potential for digitalisation to improve healthcare and welfare benefits will depend at least in part on how entrepreneurial activities are conducted (Bessant et al. 2017; Iakovleva, Oftedal, and Bessant 2019b). Addressing these issues is neither easy nor straightforward. Healthcare and welfare service issues are complex because they involve diverse interest groups: patients, healthcare professionals at different levels and organisations (hospitals, nursery homes, GP, specialist care), equipment providers, governments and governmental institutions on municipal, regional and national levels, insurance companies, as well as entrepreneurs and innovators who come up with new products or services (Iakovleva, Oftedal, and Bessant 2019b). Therefore, a classic linear techno-scientific approach often results in rejection of the innovation due to difficulties of their integration into existing systems, scepticism from healthcare professionals or lack of user-friendliness (Timmermans et al. 2020; Marschalek et al. 2022).

Moreover, the healthcare sector is a sensitive and heavily regulated system (Oftedal, Iakovleva, and Bessant 2019). Thus, ignoring societal concerns about novel technologies can result in the abandonment of many promising ventures (Oftedal, Foss, and Iakovleva 2019). Therefore, the potential societal effects of digital technologies and digitalisation in healthcare and welfare services require detailed exploration.

Digital technologies can engender entrepreneurial opportunities (Nambisan 2017; von Briel, Davidsson, and Recker 2018) and inspire new economic activities and industries (Davidsson 2015; Parker, Alstyne, and Jiang 2017; Porter and Heppelmann 2014; Shane 2012). Moreover, if developed and deployed correctly, new ventures employing digital technologies solve many societal challenges, including healthcare and welfare services (Steinhubl and Topol 2015). In particular, digitalisation might lower the costs of healthcare services, facilitate the provision of services in remote areas, and increase the efficiency and effectiveness of care (Iakovleva, Oftedal, and Bessant

2019a). At the same time, with the growing surge in digitalisation, entrepreneurs and firms have seen potential opportunities for new ventures and businesses within digital healthcare and welfare services. Exploiting these opportunities requires entrepreneurial initiatives to be inclusive, anticipatory reflective and responsive in order to address potential adverse societal effects that add to the chorus of concerns about the direction of innovation and entrepreneurial activities (Iakovleva, Oftedal, and Bessant 2019b)

Opportunities can be defined as a pool of venture ideas (Dimov 2010). However, not all venture ideas are good for society; concerns about the negative externalities and the dysfunctional effects of entrepreneurship are increasing (Lazonick 2014; Soete 2019; Zahra and Wright 2016). At the same time, opportunities are essential to entrepreneurship in general (Eckhardt and Shane 2003), and digital innovation and entrepreneurship (Nambisan 2017; Nambisan et al. 2017) in particular, but they are not enough to explain these phenomena (Davidsson 2015; Davidsson, Gregoire, and Lex 2018).

Recent studies have suggested that opportunity confidence (OC) might provide a better explanation than the mere presence of opportunities for entrepreneurial venture creation (Davidsson 2015; Davidsson, Gregoire, and Lex 2018; Davidsson, Grégoire, and Lex 2021). 'OC refers exclusively to an Actor's evaluation—from negative to positive—of a stimulus that may be relevant to the creation of new economic activity. It denotes not what the Actor sees but their evaluation of it' (Davidsson 2015, 685). OC provides deeper insight into the process of identifying potential venture ideas, evaluating them, and deciding to take action in the venture creation process (Davidsson 2015; Dimov 2010; Foss et al. 2008; Klein 2008). Exploring how entrepreneurial firms create OC is crucial to understanding venture success and firm development. In common with RI, firms must address users' and stakeholders' concerns and expectations to build OC (Dees and Anderson 2006; Gemmell, Boland, and Kolb 2012; Nicholls 2009).

Building OC in the context of digital technologies in healthcare and welfare services is demanding (Jirotka et al. 2017; Lehoux et al. 2018). Recent discussions on RI and its implications for innovation indicate that RI is a framework that can be crucial to building OC (cf Flipse and van de Loo 2018; Iakovleva et al. 2021; Long et al. 2020; Scholten and Van Der Duin 2015; Thapa, Iakovleva, and Foss 2019; Voegtlin et al. 2022). However, RI is still evolving. It is not well integrated into the corporate world, and industrial actors can perceive it as complicated and ambiguous (Dreyer et al. 2017; Lubberink et al. 2017; Oftedal, Foss, and Iakovleva 2019). While most of the discussion around RI relates to the governance of the research process in the university and research sector (Silva et al. 2019), we look at entrepreneurs and firms. Entrepreneurs explore and exploit opportunities and contribute to socio-economic change (Choi and Shepherd 2004; Clough et al. 2019). They are increasingly recognised as change agents (Choi and Gray 2008; Lubberink et al. 2019; Nicholls 2009). Similarly, firms are the drivers of innovation, their role in contributing to grand societal challenges is critical (Blok et al. 2015; Long et al. 2020; Thapa and Iakovleva 2019).

It is, therefore, necessary to understand whether and how firms adopt RI in the venture creation process and how the integration of dimensions of RI can contribute to OC for venture creation and firm development. Therefore, the paper seeks to answer the following research question:

To what extent does an RI approach contribute to building OC in venture creation and firm development?

Accordingly, the paper explores the extent to which RI dimensions of inclusion, anticipation, reflexivity and responsiveness contribute to building opportunity confidence of firms and entrepreneurs in new venture creation and firm development. It examines the venture creation process in general and OC specifically and the role of RI approaches in evaluating potential venture ideas that build OC to act for desirable outcomes. Overall, it contributes to the discourse on RI by addressing the value of responsible entrepreneurship.

The remainder of the paper is structured as follows. Section 2 describes venture creation in digital healthcare and welfare services and RI and its dimensions. Section 3 presents the research design. The research findings are presented in Section 4, the discussion in Section 5, and the conclusion in Section 6. Section 6 also describes the paper's contributions, the theoretical and practical implications of the findings for entrepreneurs and policymakers and the limitations of the research.

Venture creation in digital healthcare and welfare services

There is a growing belief that digitalisation can enable venture opportunities in various sectors, including healthcare and welfare services (von Briel, Davidsson, and Recker 2018). Thus, digitalisation is evolving with unprecedented velocity, offering innovators and entrepreneurs new ways of gaining knowledge, enhancing capabilities for innovation and entrepreneurship and enabling faster data collection, aggregation, and analysis (e.g. Brynjolfsson and McAfee 2014; Steinhubl and Topol 2015). Digital platforms have brought together an ecosystem of producers, users, customers, and complimentary service providers, enabling them to co-create products and services (e.g. Dufva et al. 2017; Frey, Lüthje, and Haag 2011). Furthermore, digitalisation has enabled novel functions in products with a remarkable price/performance ratio (Yoo 2010; Yoo, Henfridsson, and Lyytinen 2010). Therefore, harnessing the potential of digitalisation could enable not only new venture opportunities but also quality products and services at a reduced cost (Yoo 2010), new economic activities, new industries (Nambisan 2017; Parker, Alstyne, and Jiang 2017; Porter and Heppelmann 2014) and solutions to grand societal challenges (Christensen and Fogg 2017; Dufva et al. 2017).

There has been a surge in venture creation of digital artefacts, platforms, and infrastructure by entrepreneurs and firms in the digital healthcare and welfare service sector (Nambisan 2017; Parker, Alstyne, and Jiang 2017; Porter and Heppelmann 2014). eHealth, defined as the use of modern information and communication technologies to meet the needs of citizens, patients, healthcare professionals, healthcare providers, and policymakers (European Commission 2016), can be taken as an example.

The ultimate goal of entrepreneurship is to create new ventures that stimulate economic development and employment and provide profits for their shareholders. Despite its increased recognition as a driver of economic development, concerns have been raised due to the adverse effect of entrepreneurship in society (Nicholls 2009; Zahra and Wright 2016). This is especially true for digital healthcare sector, where ventures within digital healthcare and welfare services can create negative impacts, such as

public concerns about privacy and security due to digitalisation (Hofmann 2013; Jirotka et al. 2017). Thus, entrepreneurship scholars have raised concerns about how opportunities are discussed and interpreted in entrepreneurship research (Davidsson 2015; Eckhardt and Shane 2003; Klein 2008; Gras et al. 2020; Scheaf et al. 2020).

The interpretation of opportunities can be ambiguous and even elusive in complex problems, especially in healthcare and welfare contexts (Davidsson 2015; Hsieh, Nickerson, and Zenger 2007; Gras et al. 2020). Entrepreneurs see opportunities and take actions that might not achieve desired outcomes or abandon potential opportunities that bear socio-economic values. OC has been proposed as an important construct in the venture creation process. It makes one of the four primary constructs of the venture creation process, thus, alongside venture ideas, action and outcomes (Davidsson 2015). Although all the constructs are vital in the venture creation process, OC is crucial since it largely determines its success. It denotes entrepreneurs' evaluation of venture opportunities (Davidsson 2015). It depends on different socio-economic, socio-ethical and socioecological factors (Gemmell, Boland, and Kolb 2012) key to developing belief in the feasibility of the opportunity and start-up self-efficacy (Dimov 2010). For example, opportunity feasibility belief depends on the ability of entrepreneurs and firms to make customers, users and stakeholders believe in their offerings and gain confidence in attracting resources essential to building competitive advantages over others (Dimov 2010; Eckhardt and Shane 2003). Similarly, start-up self-efficacy is the entrepreneurs' and firms' confidence regarding creating new ventures (Bandura 1982; Dimov 2010) and can be enhanced through social interactions and mutual and experiential learning (Gemmell, Boland, and Kolb 2012; Kolb and Kolb 2009; Lorsbach and Jinks 1999; Timmermans et al. 2020). The rationale is that the entrepreneurial actions taken with OC will likely lead to desirable outcomes since it facilitates the evaluation of venture ideas available to entrepreneurs.

It is increasingly recognised that entrepreneurial success depends on whether or not the solutions offered by the firms meet the needs, values and expectations of the users, customers and stakeholders in the entrepreneurial ecosystem (Zahra and Wright 2016). Further, the adoption of solutions provided by entrepreneurs and firms depends on the users', customers' and stakeholders' perceived confidence about the solutions and belief that offered products would solve their problems (Bowen and Chen 2001). Moreover, Kuester, Konya-Baumbach, and Schuhmacher (2018) argue that users' and consumers' adoption of a product or service relies on their trust in the entrepreneurial firms producing and offering it. Thus, building OC for socially responsible venture creation and sustainable firm development, entrepreneurs and firms need to consider not only the positive externalities but also the adverse or dysfunctional effects of entrepreneurial activities in society (Zahra and Wright 2016). How firms and entrepreneurs develop OC in the context of digital healthcare and welfare services is unclear and needs further exploration. RI could be a viable approach in this context.

Responsible innovation (RI)

According to Stilgoe, Owen, and Macnaghten (2013), 'Responsible innovation means taking care of the future through collective stewardship of science and innovation in the present' (1570). RI is about collectively directing innovation and entrepreneurial

trajectories to align them with the values, needs and expectations of stakeholders and society at large (Owen et al. 2013; von Schomberg 2013). For this purpose, integrating the dimensions of the RI framework—inclusion, anticipation, reflexivity and responsiveness (Stilgoe, Owen, and Macnaghten 2013) in venture creation and business development is an emerging approach (Iakovleva, Oftedal, and Bessant 2019c).

Inclusion dictates that stakeholders and the public be engaged as soon as innovation and entrepreneurial activities are initiated (Owen, Macnaghten, and Stilgoe 2012). It allows active democratic participation, which brings knowledge diversity to the problem of identifying and agreeing on the most necessary steps to take to alleviate social and environmental issues. Entrepreneurs should ensure the inclusion of a broad group of stakeholders from the very beginning of the innovation and entrepreneurial process, including representatives of the public sector, non-governmental organisations, citizen groups, users and customers. Such inclusion facilitates broader knowledge accumulation on society's needs and integrates the views and interests of different societal actors. It provides a platform for open innovation (Chesbrough 2006; Long and Blok 2018) and helps entrepreneurs to identify potential venture ideas (Davidsson 2015), builds consensus for legitimacy (Irwin 2006; Hajer 2009) and provides opportunities for diffusion (Asveld, Ganzevles, and Osseweijer 2015) of products and services.

Anticipation consists of systematic thinking about the potential intended and unintended consequences of a particular innovation or venture (Guston 2014). It encourages critical thinking about possibilities, opportunities and feasibility (Martin 2010; te Kulve and Rip 2011). Anticipation should be directed not just to questions of financial risk or gain but also to the positive and negative externalities of innovation and entrepreneurial activities in society at large (Zahra and Wright 2016).

Reflexivity in the innovation and venture creation process is about the value proposition offered to the stakeholders, environment and society (Stilgoe, Owen, and Macnaghten 2013). Entrepreneurs and firms need to be mindful of their value propositions. Exaggerating them creates higher expectations in customers, users, and stakeholders. Failing to meet those expectations when the product or service is introduced would shake stakeholders' confidence in the venture, reducing its likelihood of success. Therefore, reflexivity is essential in establishing and maintaining sustainable relationships in networks, collaborations, and partnerships. Reflective entrepreneurs are more likely to build their societal image and reputation (Lee and Kim 1999; Stahl 2013).

Responsiveness is the willingness of innovators and entrepreneurs to show respect and care towards stakeholders and societal actors during venture creation and business activities (Meijboom, Visak, and Brom 2006). It enables co-responsibility when shaping need-based ventures for alleviating societal problems. Social expectations of businesses have changed, and entrepreneurs must change their value creation horizons to incorporate societal and environmental well-being in addition to profit (Zahra and Wright 2016). Venture creation attempts merely incentivised by entrepreneurial opportunity might lead to venture failure and result in a lose-lose situation for entrepreneurs and society.

Despite the potential benefits of integrating RI policies into innovation and entrepreneurship, it remains unclear how RI can be employed in a firm's everyday activities (Armstrong et al. 2012; Blok et al. 2015; Dreyer et al. 2017; Lubberink et al. 2017).

For RI practices to become part of innovation and entrepreneurial processes, firms and entrepreneurs must know why and how such practices should be adopted and what value such initiatives add to them (Long and Blok 2018).

For this study, we considered two aspects of integrating RI dimensions into innovation and business activities. First, we focused on assessing the extent to which RI is practiced by firms and entrepreneurs in new venture creation and firm development. Secondly, we examined how the RI approach facilitates building OC in venture creation and firm development.

The potential role of RI and OC in venture creation and firm development

Despite their contributions to economic development, employment and social well-being, firms and entrepreneurs are criticised for not doing enough for society at large (Lazonick 2014). There is growing sentiment that entrepreneurs need to take social responsibility for their products and services and move beyond profit maximisation to consider the intended and unintended consequences of their entrepreneurial activities (Owen et al. 2013; Zahra and Wright 2016). Due to the increasing negative externalities of innovation and economic activities in society, such as climate change, public health and disparity, concerns have been raised about societal values, risks, and benefits of innovation and entrepreneurship (Thapa, Iakovleva, and Foss 2019). If these concerns are not addressed, there is a danger that an already existing crisis of mistrust of stakeholders and users towards the business community could hinder the adoption of innovative solutions (Dreyer et al. 2017). Therefore, innovators and entrepreneurs must align their innovation and entrepreneurial activities with society's values, needs, and expectations to avert any danger of losing stakeholders' and public trust in innovation and entrepreneurship in the wake of widening grand challenges (Ashworth et al. 2019; von Schomberg 2013). This also means that firms and entrepreneurs need to consider socio-economic, socio-ecological and socio-ethical factors in venture creation and firm development activities (Flipse and van de Loo 2018; Long et al. 2020; Zahra and Wright 2016).

Therefore, start-ups and incumbent firms need to identify, understand, and critically evaluate the potential social benefits and hazards of innovation and entrepreneurial activities (Markus and Mentzer 2014; Zahra and Wright 2016) before making decisions about venture creation. Failing to consider the socio-economic and socio-ethical factors in venture creation and firm development activities will affect firms and entrepreneurial success (Brand and Blok 2019).

Arguably, firms and entrepreneurs need to build OC to evaluate the opportunities resulting in successful and sustainable ventures. While social interaction is the base to build OC (Gemmell, Boland, and Kolb 2012), the dimensions of RI principles can play an instrumental role. Thus, they may help evaluate socio-economic, socio-ecological and socio-ethical factors to build OC that enables sustainable and responsible venture creation and firm development (Long and Blok 2018; Lubberink et al. 2019; Wickson and Carew 2014; Voegtlin et al. 2022).

The inclusion of a diverse range of stakeholders and users early in the venture creation process allows entrepreneurs and firms to identify heterogeneous expectations, needs and concerns (Stilgoe, Owen, and Macnaghten 2013; von Schomberg 2013). It provides access to a diversity of expertise that may be crucial in venture creation and

firm development. The direct interaction with a diverse group of stakeholders, customers and users provide knowledge about the reverence of venture ideas, access to potential collaboration, networking, resources, experiential learning environment and refinement of their venture ideas (Timmermans et al. 2020; Marschalek et al. 2022). Moreover, inclusion enables the communication of otherwise inaccessible tacit knowledge (Shane 2000; Carayannis and Campbell 2014), resulting in the co-creation of potential solutions to societal problems (Long and Blok 2018). The deliberate inclusion of stakeholders and potential users, on some occasions, empowers vulnerable stakeholder groups (Brand and Blok 2019; Iakovleva, Oftedal, and Bessant 2019a). These opportunities will facilitate firms and entrepreneurs in developing feasibility beliefs about the products and services, ultimately increasing venture success (Davidsson, Gregoire, and Lex 2018; Dimov 2010).

Anticipation enables entrepreneurs and firms to make subjective judgments about the potential consequences of venture ideas that go beyond financial risk to include societal and environmental risks (Guston 2014). It allows them to foresee alternative solutions (Martin 2010; Gudowsky and Peissl 2016) that are desirable and enhance the impact of the innovation and ventures (Rhisiart, Störmer, and Daheim 2017). Arguably, anticipation allows firms and entrepreneurs to think out of the box and will enable them to critically consider the unintended consequences of their innovation and ventures in society beyond financial profit and loss. Further, it keeps firms and entrepreneurs updated with the expectation of the stakeholders and users in the entrepreneurial ecosystem. Thus, anticipation enhances product and service efficacy and self-efficacy to decide and launch the venture confidently.

Reflexivity enables entrepreneurs and firms to keep themselves open and transparent about their capabilities and activities in venture creation and firm development (Weber and Rohracher 2012). Reflexive firms and entrepreneurs can maintain trustworthy relationships among stakeholders and users, ensuring their support and increasing the likelihood of adaptation of their product and services (Asveld, Ganzevles, and Osseweijer 2015; Kuester, Konya-Baumbach, and Schuhmacher 2018). Further, reflexivity aids firms and entrepreneurs in reputation building (Lee and Kim 1999; Stahl 2013) and enhances the stakeholders', users and potential users' confidence about their offerings which enables in adoption and diffusion of their products and services (Bessant et al. 2017; Rogers 1995). Thus, reflexivity can ensure firms and entrepreneurs' feasibility belief about the ventures and enhance self-efficacy belief in venture creation and firm development.

Finally, responsiveness enables entrepreneurs to develop a dynamic capability (Eisenhardt and Martin 2000; Teece, Pisano, and Shuen 1997) to provide solutions to grand societal challenges and stakeholders and users' needs and expectations in ways that go beyond their legal obligations (Owen et al. 2013; Pellizzoni 2004; Pellizzone et al. 2015). Responsiveness allows firms and entrepreneurs to listen to the concerns of stakeholders and users very carefully and enables them to take care of their users and stakeholders (Stilgoe, Owen, and Macnaghten 2013). Through responsiveness, firms and entrepreneurs can enhance their reputation in society and establish themselves as responsible entities, enhancing their sustainability (Wicks and Berman 2004). Thus, responsiveness enhances their feasibility and efficacy belief in venture creation and firm development.

Research design

The aim of this study is to explore the extent to which firms and entrepreneurs practice RI in venture creation and firm development, and whether RI practices facilitate to build OC. The context of the study is digital healthcare and welfare services. Both RI and digital venture creation in healthcare and welfare services are new and emerging fields. Both these social phenomena warrant a detailed understanding of how firms and entrepreneurs practice RI dimensions in venture creation and business development and how such incentives enable them to build OC in socially responsible and sustainable ventures and firm development (Yin 2014).

Therefore, we chose an explorative qualitative approach (Edmondson and McManus 2007) and employed a multi-case study design to carry out in-depth investigation and data triangulation from multiple sources, including secondary data sources (Eisenhardt 1989; Eisenhardt and Graebner 2007).

Case selection and data collection

We considered nine firms at different life stages, including three start-ups, three recently launched ventures and three established firms. The firms are part of the 194 members of the Norwegian Smart Care Cluster (NSC), located in the Stavanger region in Norway and engaged in digitalising healthcare and welfare services. S1, S2 and S3 are Start-ups at the prelaunch stage that are prototyping and testing their products or services. L1, L2 and L3 are Start-ups at the launched stage that have moved beyond the testing phase to launch products into the market. Established firms have recognised products on the market. E1, E2 and E3 are established firms promoting digital healthcare and welfare products and services as a separate business unit or have introduced it as an incremental innovation by incorporating digital components such as software or additional hardware into existing products. Our purpose in adopting multiple case studies was to understand the similarities and differences between the cases and enable us to analyse data within and across cases (Gustafsson 2017).

The cases were selected following a purposive sampling strategy (Patton 2002), adopting the following criteria: (1) Start-up firms or innovative projects within small or medium-sized firms in the early stage of development. (2) All the firms engaged in digital innovation in healthcare and welfare services. The head of NSCC provided a list of 20 firms meeting our criteria. We contacted all the firms, and nine firms showed a willingness to participate in the research project. Table 1 provides an overview of the case firms participating in this study.

Data were collected longitudinally through two rounds of semi-structured in-depth interviews with CEOs and project managers of the firms and other stakeholders associated with eHealth promotion in the region. In the first round, between autumn 2016 and spring 2017, we conducted 11 interviews with nine firms and 14 interviews with other actors associated with healthcare and welfare service innovation in the region. We chose CEOs and project managers, and directors for the interviews. We believe they could better reflect on their experiences, approaches and strategies in venture creation and firm development. The other actors included representatives from a regional cluster of firms in welfare technologies, employees of home care services that use

Table 1. Description of the case firms, their status and sources of data.

Firms	Established	Products/Services	Purpose	Target groups/ customers	Interview[a] data Round 1	Interview data Round 2	Status
S1	2015	Digital Platform where care providers, administrators and external suppliers of e-learning materials interact and update their knowledge and monitor their progress.	Competence building	Healthcare workers	CEO and Project manager	CEO	Start-up pre-launched
S2	2014	Digital application (app) for collecting and owning personal experience data that can be shared or even traded.	Empowering Users	Publics	Project manager	Project manager and CEO	Start-up pre-launched
S3	2016	Digital platform for interaction and coordinating services.	Coordination competence building	NGOs and volunteer organisations in healthcare services	CEO	CEO	Start-up pre-launched
L1	2012	Digital self-health assessment application (app) for monitoring lifestyle to improve and maintain physical and mental well-being.	Healthy and active living	Students, employees, senior citizens	CEO	CEO	Start-up launched
L2	2015	Smartwatch-based automatic health alarm with two-way communication capacity in a compact package.	Minimising health risk	Individual user	CEO	CEO	Start-up launched
L3	2012	GSM-and GPS-based security alarm.	Safety solution	Older citizens living alone at homes/ care homes	Project manager	Project manager	Start-up launched
E1	1998	Digital platform for clinical collaboration and security services	Quick, improved quality and cost-effective healthcare delivery/ e-health	Offshore businesses	Project manager	Project manager	Established
E2	1980	Integrated digital comments in comfort wheelchairs/ smart wheelchairs.	Independent living	Handicapped individuals	CEO	CEO	Established
E3	1940	Integration of digital components to patients' simulators for increased risk-free training in emergency care.	Help save lives	Healthcare professionals Healthcare educators Publics	Technical director-patient care & Project manager	Technical director & Quality assurance (QA) director	Established

[a]Interview data of 14 stakeholders in round 1 and 2 stakeholders in round 2 were also included. The stakeholder group is common for all the firms since they are from the same region and same cluster.

welfare technologies and the head of a regional strategic planning organisation. In addition, the president of a retirement organisation was interviewed as a representative of retired older people; retirees represent a significant number of potential digital healthcare and welfare service users. Each interview lasted for 60–80 min.

The second round of interviews was conducted a year later, in 2018–19. It comprised 11 interviews (40–60 min each), nine with the case firms and two with other stakeholders. In the second round, we interviewed the same individuals as in the first round, except for firm S3, where we interviewed the Quality assurance (QA) director as recommended by the previous interviewee. The purpose was to share our analysis from the first interview and get updated information associated with venture creation and firm development activities. The two new stakeholders were identified as influential in the digitalisation of healthcare and welfare services and interviewed.

All the interviews were recorded with permission from the interviewees. In addition to the interviews, we collected secondary data from the firms' home pages, documents and presentations they provided and press releases about their products and services. Data were also collected from official documents on eHealth policy and future healthcare policies in Norway, two international eHealth conferences, two international smart-city conferences hosted in Norway and three regional workshops related to the digitalisation of healthcare and welfare services.

The semi-structured interviews provided a relatively open method for collecting data. As part of the interview, participants were asked to reflect on narratives of their venture creation and firm development processes. They were then asked specific questions to reflect on their motivation and engagement approaches, value proposition and responses to stakeholders' concerns about their offerings to understand the integration of RI and its implications for venture creation and business development activities. The additional data provided stakeholders' and users' opinion about digitalisation of healthcare and welfare services, firms engaged in digital innovation in this sector and their offerings.

Data analysis

The audio-recorded interviews were transcribed verbatim, allowing analysis of the transcripts.

We used a manual coding approach (Saldana 2015) to code the contents of the transcriptions. Initial coding involved searching for references for RI dimensions of inclusion, anticipation, reflexivity and responsiveness. Specifically, examining nuances like who was included in the venture creation and when, what they perceive about the unintended consequences of their product and services, the motivation behind venture creation, their value proposition and how they respond to the users' and stakeholders' values, needs, concerns and expectations based on their feedback. Next, sub-themes were drawn out under the different RI dimensions and how they facilitated OC in venture creation and firm development. We inspected the themes for internal and external homogeneity across the codes and the entire data corpus to ensure that relevant data was not omitted. Finally, we chose data excerpts to include in the presentation of the results to augment the transparency and trustworthiness of the analysis.

Findings

In this study, we investigated the entrepreneurial activities of nine firms operating in the digital healthcare and welfare service sector to explore the value of applying the principles of RI in firms and examine whether such initiatives facilitate them in building OC. In this section, we will discuss the findings of firm practices alongside four RI dimensions: inclusion, anticipation, reflexivity and responsiveness. Both advantages of such practices and challenges related to implementing these practices will be highlighted.

In line with previous studies on RI in the industry (e.g. Blok et al. 2015; Long et al. 2020; Lubberink et al. 2017; Stahl et al. 2017), our findings also suggest that all the firms studied were not familiar with RI principles per se. However, looked at through the lens of RI, they integrate and practice RI dimensions of inclusion, anticipation, reflexivity and responsiveness to varying degrees. Furthermore, like previous studies(e.g. Blok et al. 2015; Dreyer et al. 2017; Oftedal, Foss, and Tatiana Iakovleva 2019; Poel et al. 2020), we identified several obstacles to the adaptation and practice of RI in venture creation and firm development processes, especially in the case of early-stage start-ups.

Table 2 shows how firms and entrepreneurs, in our cases, practiced inclusion, anticipation, reflexivity, and responsiveness. We viewed such practices through the lenses of six pillars. The first pillar refers to 'who': who was involved in the four above-mentioned RI dimensions. The second is 'when': at what stage of the entrepreneurial journey these processes happened? Further, we considered 'what': what was included, anticipated, reflected, and responded to. Then, we considered the 'how': how firms practiced these RI activities. Finally, we clarified the 'outcomes' and 'implications for Opportunity Confidence': what such RI activities resulted in and how such practices facilitated building OC in innovation and entrepreneurial activities.

We will now explain the table by considering firm practices of the four dimensions of RI: inclusion, anticipation, reflexivity and responsiveness and how such practices lead to building OC in venture creation and firm development.

Inclusion: The firms studied include a range of stakeholders in venture creation and business development activities. They engage stakeholder groups in varying degrees. For example, firms L2 and L3 have mainly customers, investors, suppliers, designers, and experts in their networks. Others extended their networks to include users and potential users as well. In the case of firms S3 and L3, however, the firms considered their priorities in weighing the inclusion of stakeholders, choosing those they believed could directly add value to their ventures or the company's development and whom they perceive to be trustworthy. The entrepreneurs and firms practised stakeholder inclusion through workshops, opinion polls, open innovation, and open networking approaches.

All the firms indicated that engaging diverse stakeholder groups allowed them access to knowledge about the perspectives of those stakeholders: their needs and expectations and their attitudes towards innovative venture ideas. Inclusiveness enabled firms to be closely acquainted with stakeholders' needs, opinions, and expectations about the solutions. It allowed the firms to know the feasibility and scope of their offerings from diverse perspectives. As the quality assurance (QA) director of firm E3 emphasised the value of inclusion:

> Mapping the customer journey is all about identifying customers' need, and really understand what customers' needs because asking the customers not always sufficient. We need

Table 2. Findings on RI practices and contribution to building OC in venture creation and firm development.

RI dimension	Who	When	What	How	Outcomes	Implications for Opportunity confidence
Inclusion	Customers Experts Consumers/Users Investors Potential users Next of kin of potential users	At different stages of venture creation	Ideas, opinion, emotions, knowledge and experience	Workshops Surveys Open innovation Open network Crowdsourcing	Access to new knowledge/ resources Experiential learning Knowledge Sharing/creativity Mutual benefits Empowerment	Feasibility belief: knowledge, resources, potential success, alternatives options, investment, partnership, collaboration opportunities Self-efficacy belief: Mutual and experiential learning, interactions Trust building Reputation
Anticipation		Mainly at the beginning	Risk Privacy Uncertainty Safety Expectations Potential benefits	Forecasting Scenario analysis Probability Technology assessment	Awareness of consequences, but mostly limited to financial risks	
Reflexivity		Throughout	Purpose Motivation Scope Quality Value	Business model Mission statement Impact	Customer relationship Support Ripple effect	
Responsiveness		At different stages, but most commonly in the testing phase	Users and stakeholders' feedback concerns worries	Change in design Constant modification and improvement of products Chang in business models	Mutual understanding Respect Care Adaptive capability Dynamic capability	

> to go out, observe and spend time with them to really understand their needs. QA Director, E3.

Similarly, the firm S1 introducing an e-learning platform for healthcare workers explained their purpose of stakeholder and user inclusion in their venture creation process:

> The system they had in oil sector or other sectors through years and years, you can't just transform that to home or care sector. You need to ask them what they need because you have to start from scratch and get the system that adapts well in everyday life and their work today. CEO, S1

The inclusion of stakeholders and users in the venture creation process could provide mutual benefits for the firms and stakeholders. The stakeholders and users who were frustrated not getting the solutions to their needs and expectations thought that engaging with firms developing solutions could benefit both. The health educator, one of the influential stakeholders in the healthcare and welfare sector, expressed her thought:

> I want them to make something that I can use. I am more interested in helping them, making something that I can actually benefit from and actually use in my tutoring to students. Health Educator

Data analysis also showed that firms include stakeholders at different stages of their venture creation process. Those who managed to have a diversity of stakeholders, including the users' group, were advantaged by getting the opportunity of familiarising with the root cause of the problems and appropriate solutions early on, accumulating confidence of appropriateness of their offerings to the users, customers, and stakeholders. Firm E shared the significance of user inclusion while developing solutions:

> We have user-centred teams because our thinking is that this team is responsible for these users and they have continuity in the team, they regularly go out and visit customers, getting feedback, and over time, they would build that understanding of customers. So, that again reduces the chances of going all wrong with the products. Technical director, E3

The stakeholders' information, particularly at the beginning of the venture creation process, provided significant value for the firms as they were the sources of knowledge and inspiration to continue their ventures. In some cases, the inclusion of diverse stakeholder groups early in the ideation phase enabled firms to develop solutions in collaboration with the experts, users, and service providers. They leveraged these opportunities to co-design products, make users and stakeholders more confident about their solutions and even empower users.

Firm L1 shared their failure story of trying to push the solutions to users and how they succeeded by users' inclusion in designing and testing the solutions.

> When we introduced a digital self-assessment platform for the employees in municipalities, they did not like our solution. Instead, they preferred the traditional paper version. However, they began to love it when we worked closely with them and designed the platform accordingly. CEO, L1

Firm E3 also shared their success story of new product development through the early inclusion of users in the venture creation process:

> Without working together with our partners, who are experts in emergency care and users of our solutions, we would not have been able to develop such successful solutions for emergency care. Project director, E3

However, in some cases, firms L2 and L3, for example, the entrepreneurs and firms, seemed to overlook the inclusion of users earlier in the venture creation and firm development process. Users are a marginalised stakeholder group with the least decision-making power in these cases. In other words, they are considered passive recipients of the solutions. Hence, they were included in the testing or launch phase to assess the efficacy of a product and gain legitimacy for it. However, as a result of such late inclusion, the potential users in these cases denied the acceptance and adoption of the first version of innovative solutions since the products did not meet users' expectations regarding the products' design. The firms needed to redesign and reproduce the product to their specification, which incurred firms extra time and investment.

Data analysis also revealed that some of the firms, especially the early start-ups with limited access to resources and external knowledge networks, are unable to invest in engagement activities, despite recognising the benefits of a diversity of stakeholders and users in the venture creation and firm development process.

In some cases, for instance, in firm S3, the entrepreneurs were hesitant to include influential corporate actors whom they perceived as competitors in their network. They feared that they would steal their ideas and lose their opportunity.

Further, as noted in the case of firms S3, L1 and L2, entrepreneurs felt that interacting with policymakers and decision-makers who had the purchasing power in municipalities was very challenging. First, firms experienced difficulties in getting access to the decision-makers. In the cases mentioned above, influential stakeholders (policymakers and decision-makers) either turned down the firm's invitation showing their busy schedules or cancelled the meetings at the last minute. Thus, firms believe they have no or negligible influence on such decision-makers. During our study, we also interviewed influential stakeholders. We found that healthcare and welfare service providers often do not believe in the product efficacy offered by early start-up firms. They feel responsible for providing robust and proven solutions to citizens with at least three years of track record. For many entrepreneurs, such a condition was an impossible requirement.

Anticipation: The firms we studied anticipated risk. Despite major concerns about risk on investment, many firms and entrepreneurs expressed concern over the impact their solutions will have on the public.

> If appropriately implemented or used as tools to facilitate healthcare technologies, it could save time and resources, increase efficiency, and increase the level of emergency care. Technology can be a support mechanism in healthcare since it facilitates resource allocation to improve healthcare quality. Health educator

The quote illustrated the need and expectations of stakeholders who were also potential users of digital healthcare and welfare technology. It indicates that the firms should anticipate stakeholders' and users' needs and expectations. Further, they need to anticipate the unintended impact of digital technology and reflect on the measures they are taking to prevent possible damage due to the implementation of technologies in society.

Data analysis indicated growing practices among the case firms and entrepreneurs on anticipation beyond financial risks including unintended consequences that the digital

technologies might cause to the stakeholders and users. Therefore, the firms and entrepreneurs anticipate the privacy, security, and ethical issues accompanying digitalisation. They have adopted different forecasting, scenario analysis, probability, and technology assessment strategies. Moreover, case firms have thought about backup solutions to overcome the negative consequences that might cause due to the digitalisation of services.

> With all this data, you would have to plan for privacy. How will you handle it? and the way we have solved it is that the customers owe their data. Also, we are using encryptions and blockchain technology to keep it safe. Manager S2

Data analysis also showed that anticipating and reflecting on alternative solutions to overcome the undesired effects of digitalisation can enhance security, transparency, traceability of shared data, and trust across entrepreneurial ecosystems. Thus, anticipating socio-economic and ethical risk enabled product or service adoption confidence among the potential users and stakeholders. Also, it helped firms and entrepreneurs develop OC about the service efficacy and feasibility of new ventures and businesses.

Reflexivity: The entrepreneurs came up with venture ideas from their own experiences, as in the case of S2, L2 and E2. Firms S1, L1, E1 and E3 got the venture ideas from their professional experiences. The venture ideas of the firms S3 and L3 came from customers' needs. All the venture ideas aimed to promote healthcare and welfare services in the region and contribute to the socio-economic transformation of the region.

Further, the firms and entrepreneurs are reflective in their value propositions to the stakeholders and users, although the degree of reflexivity varies. Some firms emphasised and reflected on the technical efficacy of their solutions but overlooked other issues associated with healthcare efficacy. Others exaggerated the efficacy of the solutions they developed. From the perspective of healthcare experts, these firms had overstated their value propositions—and this can be problematic because they cannot live up to the promises they initially made. These firms managed to convince their customers and investors to a certain extent but failed to convince healthcare workers, experts and users. However, many firms believed they could retain good relationships with stakeholders and users as long as they were reflexive in their commitments. Firm E3 elaborated on how they reflect on their value propositions to the stakeholders:

> Our key challenge is to deliver on time and cost. Some of us thought it was not ready to deliver, but the push was so hard that we must because we promised to. So, we shipped around forty units and discovered problems later. (… .). The thing is that it is acceptable as long as you do it in the right way. You respect your customers, inform them, visit them and fix the problems. QA Director E3

Data analysis revealed that the reflexive firms and entrepreneurs could maintain a trust relationship that enabled certainty about venture and business development feasibility.

As the project manager of firm E1 expressed his experience of winning stakeholders' trust and support being reflexive on the efficacy of their offerings:

> The senior management team was sceptical about our value proposition. However, when we demonstrated that it works efficiently, they trusted our solution and decided to implement it. We always focus on the quality of our services and customers' satisfaction. This is the reason why we could retain our high customer retention rate. Project manager (E1).

Data analysis revealed that case firms value openness and transparency in their value propositions to the stakeholders and users. As clearly specified by one of the respondents:

> We are not making medical equipment; that is very important to know. Our equipment is to make people feel more secure. CEO, L2.

Responsiveness: All the firms expressed a commitment to take care of stakeholders' concerns and acknowledged the importance of responding to their concerns. They emphasised the importance of addressing the stakeholders' concerns to retain customers, establish the brand reputation and increase impact and profits through innovation and entrepreneurship. Many emphasised their responsibility to take care of others beyond profitability. Firms respond to stakeholders' and users' needs, concerns and expectations by constantly modifying product or service design and business models. Their response to pivot from the original decisions was based on stakeholders' and users' feedback and specifications. For instance, several times, firms S1, S2, L2, and E3 changed product design. Firms S3 and E3 modified their business models. Firms meant that they need to do their best to address stakeholders' and users' concerns, worries and expectations until they are addressed, which was described by the respondents:

> We work together with our customers and constantly design and redesign our solution as per their feedback and recommendation, CEO, Firm S1.

> Embrace customers' responsiveness as this is to work very close to the customers to meet the challenges we have and listen closely to what we can help with. This is highly focused. Project manager, E3

Firms also mentioned that they could develop better solutions refined and developed with constant feedback from the stakeholders, which are more desirable as specified by another respondent:

> The customer was expecting an app which we had just mentioned to them … they wanted another localisation unit that they had already used from another firm, so we decided to implement that product as well in our portfolio, Project manager, Firm L3.

In the case of firms S1, L1, L3, E1 and E3, being responsive to stakeholders' and users' values, needs, concerns and expectations enabled firms to design and develop solutions that could address stakeholders' and users' problems. Firm L1 explained that it gained many new customers and users through existing users, a ripple effect in spreading and recommending solutions to peers and organisations.

Discussion

The aims of our study were, first, to assess the extent to which firms and entrepreneurs practice RI in venture creation and firm development processes. Our second aim was to analyse whether such practices facilitate building OC. The context of our study is digital innovation and entrepreneurship in the healthcare and welfare service sector in the Western region of Norway. We now discuss each of these aims in light of our findings.

Our review of the literature articulated that firms and entrepreneurs should adopt and practice RI principles in innovation and entrepreneurial activities to achieve ambitious goals of RI (Flipse and van de Loo 2018; Lubberink et al. 2017; Stahl et al. 2017; Brand

and Blok 2019; Blok et al. 2015). However, the industrial community do not fully appreciate how RI can enhance their goals and objectives (Lubberink et al. 2019). Many still struggle to understand the value of their investment in practising RI (Poel et al. 2020). One of the reasons that the literature highlighted and our findings revealed is that many firms are unaware of the term RI (Blok et al. 2015; Lubberink et al. 2017; Poel et al. 2020). Further, the literature emphasised that RI should stem from existing business practices, not a completely new and complicated approach (Dreyer et al. 2017; Long and Blok 2018; Poel et al. 2020; Long et al. 2020). Moreover, they should see the perceived benefit of adopting and practising RI in innovation and entrepreneurial activities (Poel et al. 2020). This study, thus, brings to the fore the way firms and entrepreneurs can integrate RI and the need for them to pursue the RI approaches in venture creation and business development.

Our analysis suggests that despite low awareness of the RI term itself, firms and entrepreneurs practice RI dimensions of inclusion, anticipation, reflexivity and responsiveness in venture creation and firm development. They engage with diverse stakeholder groups in the entrepreneurial ecosystem, anticipate risk, uncertainty, and alternatives, reflect on the purpose of ventures and respond to the stakeholders' and users' values, needs and concerns. However, the degree of RI practices among the case firms varied and was influenced by their resources, motivation and access to the external networks (Blok et al. 2015; Dreyer et al. 2017; Oftedal and Foss 2019; Poel et al. 2020). Besides, a lack of commitment, especially from the influential stakeholders, to engage in innovation and entrepreneurship can challenge RI practices. A mutual commitment between firms and stakeholders is essential to successfully implementing the RI framework.

Our sample cases suggest that increasing acceptance and adoption of digitalisation engenders numerous venture ideas (von Briel, Davidsson, and Recker 2018). These ideas can contribute to grand societal challenges, such as healthcare and welfare services (Peeters et al. 2016), if developed and deployed responsibly (Jirotka et al. 2017). It also means entrepreneurial opportunities (Nambisan 2017). However, the opportunities associated with these innovations can be elusive, especially in the case of complex problems (Davidsson 2015; Gras et al. 2020). It may be necessary to build OC to ensure that these ideas can be realised in socioeconomic, socio-ethical and socio-ecological value creation through successful venture creation and firm development (Davidsson 2015; Davidsson, Gregoire, and Lex 2018; Davidsson, Grégoire, and Lex 2021). Therefore, developing OC for successful venture creation and firm development will be critical in the context of healthcare and welfare service sector (Gras et al. 2020). Failing to assess the opportunities can lead to overconfidence, tempting to invest in a venture that may bear a higher risk of failure (Koellinger, Minniti, and Schade 2007). Moreover, there is a danger that entrepreneurs might abandon the promising venture ideas due to misjudgement of their capability to carry out the ventures (Dimov 2010; Scheaf et al. 2020). OC is enhanced by socioeconomic factors and social interactions (Gemmell, Boland, and Kolb 2012). Our sample focused on the roles of the RI framework in OC building activities in venture creation and firm development. It expanded the understanding of this social phenomenon. Further, our work explores that RI dimensions of inclusion, anticipation, reflexivity and responsiveness provide a mechanism to build OC beyond proving technical feasibility and efficacy to include socio-ethical feasibility and efficacy.

Our analysis illuminates that all four dimensions of RI, inclusion, anticipation, reflexivity, and responsiveness, practiced iteratively, facilitate OC in venture creation and firm development. By including the diversity of stakeholders and users early in the venture creation process, firms and entrepreneurs can access heterogeneous needs, concerns, and expectations of stakeholders and users (Owen et al. 2013; Stilgoe, Owen, and Macnaghten 2013). They can learn closely about the root cause of the problems and the frustrations that the users and stakeholders face with the existing solutions (Gemmell, Boland, and Kolb 2012; Timmermans et al. 2020; Marschalek et al. 2022). Further, firms and entrepreneurs get access to knowledge, expertise, external resources and collaboration opportunities to support the further development of venture ideas (Thapa, Iakovleva, and Foss 2019). Moreover, the inclusion of users early in the venture creation process enabled entrepreneurs to communicate tacit knowledge (Carayannis and Campbell 2014). This resulted in co-creation, as noted in some of the cases of our samples. Firms assessed product and service feasibility and efficacy which enabled them to decide whether to consider the venture idea or pivot them.

In line with previous literature, our analysis suggests that firms and entrepreneurs who are open and transparent on their purpose and true to the efficacy of their offerings to the stakeholders can increase trust among stakeholders (Asveld, Ganzevles, and Osseweijer 2015) and likelihood of adoption of their offerings (Kuester, Konya-Baumbach, and Schuhmacher 2018). Thus, they can advance feasibility belief about their ventures and self-efficacy belief in venture creation and firm development. Moreover, firms and entrepreneurs who listen and take it seriously about stakeholders' and users' actual needs, values, expectations and concerns can develop dynamic capability (Teece, Pisano, and Shuen 1997). They modify their products and service design to accommodate users' and stakeholders' needs and expectations, thus making optimal desirable solutions which are sustainable and responsible (Owen et al. 2013; von Schomberg 2013). Firms and entrepreneurs who are responsive towards stakeholders and users can increase their social reputation (Zahra and Wright 2016). Thus, firms can boost their venture feasibility and efficacy belief, hence OC in venture creation and firm development.

Including a diversity of stakeholders and users early in the venture creation and development enables firms to develop venture feasibility through knowledge diversity, resources and collaboration opportunities. Similarly, anticipation enables subjective judgement on firms' and entrepreneurs' self-efficacy and venture efficacy. Finally, reflexivity and responsiveness enhance venture feasibility and efficacy beliefs, ultimately advancing firms' and entrepreneurs' OC. Moreover, our analysis shows that practising RI in venture creation and firm development empowers users and stakeholders (Brand and Blok 2019; Iakovleva, Oftedal, and Bessant 2019a). Such initiatives also increase stakeholders' confidence about the efficacy of the offerings, who can recommend the solutions to others resulting in ripple effects.

Conclusion

We sought to explore the extent to which RI dimensions of inclusion, anticipation, reflexivity and responsiveness contribute to building OC in venture creation and firm development. The motivation was that despite the growing interest in RI in recent years, its

application in the business context remains limited. Accordingly, we argued that firms and entrepreneurs could incorporate the RI principal dimensions in innovation and entrepreneurial activities to ensure their ventures are responsible and sustainable, which helps build OC critical for reducing the risk of failure.

The findings reveal that although the firms and entrepreneurs have not integrated RI in innovation and entrepreneurship per se, they practice RI in varying degrees in venture creation and firm development activities. The findings also reveal that the dimensions of RI principles: inclusion, anticipation, reflexivity and responsiveness enabled firms and entrepreneurs to make a subjective judgement about the feasibility and efficacy of innovative products and services. Specifically, RI helped them judge the socioeconomic, socio-ecological and socio-ethical feasibility and efficacy of innovative ideas and decide whether or not to consider such ideas for venture creation and firm development. Thus, it enabled them to build OC in venture creation and firm development activities, thus reducing the risk of failure. Early start-ups and entrepreneurs, however, find adopting and practising RI principles challenging due to resource constraints and fear of losing opportunities to competitors, despite their willingness to do so. Nonetheless, those who could incorporate the RI dimensions in their innovation and entrepreneurial activities were more confident about their venture success.

In line with previous debates, the findings allow us to argue that the RI framework facilitates start-ups and incumbent firms to identify, understand, and critically evaluate the potential social benefits and hazards of innovation and entrepreneurial activities (Markus and Mentzer 2014; Zahra and Wright 2016). They can build OC in venture creation and firm development, thus increasing firm and entrepreneurial success (Scholten and Van Der Duin 2015; Brand and Blok 2019). Moreover, the RI framework plays an instrumental role in interacting with socioeconomic, socio-ethical, and socioecological factors (Long and Blok 2018; Lubberink et al. 2019; Wickson and Carew 2014; Voegtlin et al. 2022) critical to building OC in venture creation and firm development (Gemmell, Boland, and Kolb 2012).

Our study adds to this ongoing debate about RI in the industry by providing empirical evidence of the RI approach to building OC for entrepreneurial ventures, bridging the RI and entrepreneurial literature. Further, the findings indicate real practical benefits and encourage entrepreneurs and firms to leverage RI in their venture creation process. They also point out the need to relook at policies aimed at supporting entrepreneurs and firms. Engaging potential users, the public, funding bodies, insurance companies, healthcare professionals, and policymakers early on ensured access to funding, facilitated collaboration and enabled OC to carry out the potential venture creation process in the health and welfare sector.

However, entrepreneurial firms often need more mechanisms, time, and resources to engage stakeholders. Policy initiatives are needed to facilitate the RI approach in business to make them more affordable and available. Such policies include creating boundary innovation spaces such as living labs, social labs, and accelerators where firms will get support in finding and engaging with different stakeholders. Besides, funding initiatives supporting deliberate stakeholder inclusion in the firm innovation process might be helpful. Lack of knowledge about responsible innovation and its underlying dimensions and the value of practising them could also be overcome by providing training and help in building structured engagement processes.

While the above holds, this research is not without limitations. Although it allows studying firm practices, it is limited to the same region and industry, limiting its geographic and industry diversity. Future studies should consider RI practices in other contexts and regions. Although all the firms in our research have managed to achieve some measure of OC through RI, firms still perceive RI to be difficult to implement in business activities. Therefore, some of their behaviours may not represent the best RI practices. Moreover, most case firms have not yet scaled up their products/ services, and hence the effects of practising the RI approach on firms' market success or innovation diffusion is beyond the scope of the present study. Hence future research should focus on longitudinal design to explore the effects of the RI approach in the industry.

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