Releasing the power of users - articulating user interests to accelerate new innovative pathways in digital health and welfare sector

PART 1: Knowledge needs

Innovation involves creating value from ideas, but this raises the question of for whom is the value created? At a time when there is growing recognition of Global Challenges (Lund declaration, 2009), responsible research and innovation (RRI) is suggested as a way to govern innovation development to address challenges populations face, such as poverty, inequality, aging population and availability of quality healthcare (European Commission, 2012). Such principles suggest a broader stakeholder inclusion into the decision-making process, anticipation of societal needs and reflection of concerns (Owen et al, 2012), which calls for new innovation policies (Kuhlmann and Rip, 2017). The failure of institutions to include all layers of society into decision-making processes can lead to a sense of an individual powerlessness. Combined with digital media platforms, this can give rise to fundamental instability, such as the “yellow vests” in France, protests against Brexit, division in the US politics.

Despite the recognition of the importance of stakeholder inclusion into decisions about new solutions offered to society, RRI has stalled at the point of articulating a process of governance with a strongly normative loading, without clear practical guidelines toward implementation practices (Ribeiro et al, 2018). Work referring to responsible research and innovation (RRI) often looks at the scientific aspect and the development process in ‘grand challenges’ like climate change, resource depletion, poverty alleviation, ageing societies, etc. But we suggest there is scope for ‘responsible innovation’ (RI) approach which has a more fine-grained focus on the innovation itself (cf. von Schomberg 2013, Blok and Lemmens, 2015) and may be more amenable to operationalization. This model of RI will be the focus of the present application.

In similar fashion there is an increasingly critical stream in the corporate social responsibility (CSR) literature, suggesting that it suffers from ‘three curses’ - that it is incremental, peripheral and uneconomic (Wisser, 2012). It is therefore imperative to understand how all levels of society can be included in deliberative innovation processes, which offer solutions to the ‘Grand Challenges’ which society faces.

Our proposed project focuses on the inclusion of diverse users in innovation processes and creating of innovative eco-system for co-creation of innovations in the context of digital health and welfare (e-health).

We build on our earlier work in this field - findings from the project “Digitalize or Die: Dynamic Drivers of RRI in health and welfare services” (DoD)1, where we attempted to understand how the concept of ‘Responsible Innovation’ could be used and understood in a practical setting, such as among patients, providers, the government sector and industry in the health care and welfare sector. Our findings confirm that the healthcare industry tends to rely on traditional and linear models of innovation: basic and applied research followed by development and commercialization (Iakovleva, Oftedal, Bessant, 2019). Through the review of different healthcare systems around the world, we conclude that patients have the most vulnerable role and their voices are hard to hear (Oftedal et al., 2019 Laudal and Iakovleva, 2019). This finding echoes the long-standing insight from studies on user knowledge in innovation that despite the plethora of user involvement approaches, integrating users continues to be a challenge (van Loon, 2014; Mäkinen, 2019; Peine, 2012).

We furthermore found that new digital technologies open up opportunities for change. Digitalization of healthcare allows empowering patients to shape and direct the technologies in their own interests (Iakovleva et al, 2019). New technologies empower the patient to become a part of innovation process. In our project, we found a new type of user distributed across a spectrum in terms of their willingness and their capability for involvement in innovation and implementation of new ideas (Oliveira et al., 2018; Bessant et al., 2019):

1) the 'informed patient', equipped to use technology based on improved understanding;
2) the 'involved patient', playing an active role within a wider healthcare delivery system and enabled to do so by technology;
3) the 'innovating patient', providing ideas of their own based on their deep understanding of their healthcare issue.

In this project proposal, we aim to go deeper into the new type of user, to understand how responsible innovation in digital technologies can mobilize the knowledge and resources in each user, enabling them to play a larger role in the emerging new health paradigm.

1 Project number 247716, Norwegian Research Council, SAMANSVAR program
PART 2: The project

Objectives
In this project we will develop and extend the RRI and the CSR frameworks to make them accessible and useful tools for practitioners. In particular, our proposed project focuses on the inclusion of diverse users in innovation processes and creating of innovative eco-system for co-creation of innovations in the context of digital health and welfare (e-health). This will be achieved through several sub-goals.

First, this proposal aims to understand the range of different modes of user participation to anticipate their needs and expectations. Secondly, the project aims to create an enabling approach – a physical context, a toolkit and a framework methodology – through which users can be actively involved in the innovation process. In particular we will explore methods to enable users to articulate their needs (‘voice’) and to work together with other stakeholders in the design and co-creation of innovative products and services (‘action’). Thirdly, we will move beyond user involvement per se, but consider the broader innovation environment – the specific networks of actors, the interactions and flows of knowledge between them, and the institutional settings these are embedded in, such the innovation ecosystem (Adner, 2016; Adner and Kapoor, 2010). Such eco-system approach shown to be a determining factor in innovation clusters emerging around digital platforms (Koch and Kerschbaum, 2014), providing specific conditions for possibilities and limitations to involve users due to characteristics of health and welfare systems, regional innovation clusters, or even due to particular structures and practices that have emerged around key innovation players. The eco-system approach will help provide a more robust framework within which different actors in the social healthcare innovation ecosystem - system integrators, municipalities, healthcare professionals, small and start-up entrepreneurs and end users can explore ways to create and capture shared value.

Our proposal involves the setting up of a prototype laboratory (the SIF-Lab, Shared Innovation Futures) which will not only enable users to engage in co-creation, but where other stakeholders can work with them to develop a robust framework for shared value business models which embed RI principles around inclusion. Within innovation studies and the wider world of innovation practice there has been growing interest in the concept of ‘safe’ boundary spaces within which experimentation, prototyping and other activities can take place (Groves and Marlow, 2016). Such environments are often labelled as ‘Labs’ drawing on the analogy with research labs in which controlled experimentation, learning form failure, and prototyping. happens (Bloom and Faulkner, 2016). We suggest that there would be significant benefit from extending this laboratory context to creating a space within which users can be enabled to participate actively in innovation. An important element of our proposal is the plan to develop and test such an environment within the field of social healthcare. This lab would provide both a physical space (in collaboration with ongoing project within Norwegian Smart Care Cluster (NSCC)) and an “enabling toolkit” drawing on both methods and prototyping tools. There would also be facilitation and coaching around emerging projects, making use of learning methodologies.

The project is organized in four work packages; **WP1 Understanding users side** address the first project objective of understanding the range of different modes of user participation though identifying attitudes, concerns and expectations of users in relation to welfare technology, **WP2 Creating a boundary innovation space** address the second project objective of creating an enabling approach and develops ‘design specifications’ for an ‘innovation space’ to help to accelerate user involvement. It furthermore undertakes interventions and pilot the “SIF Lab” and builds on that learning. **WP3 Enhancing the ecosystem** address the third project objective of developing a robust framework for ‘shared value’ business models. It identifies stakeholder’s motivations and suggests collaborative business models for ‘free innovation’, in particular, it will assist user-inspired innovative micro businesses to generate value in collaboration with system providers, municipalities, investors, and health enterprises to generate socially desirable outcomes. **WP4 Open learning arena** deals with dissemination of results and communication with virtual national centre for RRI activities in the form of providing an open learning arena for all participating project partners and national centre participants.

3. Frontiers of Responsible Research and Innovation
The term responsibility has a long heritage as a field of research and practice. Today the discussion focusses on key themes such as sustainability, ethics and social responsibility in a wide range of books and journals (Owen, 2009, Owen, Bessant, Heintz, 2013; Stilgoe, Owen, Macnaghten, 2013). Different theoretical concepts have developed. Corporate Social Responsibility (CSR) is concerned with ways how companies can act as
responsible citizens towards their stakeholders. While CSR practices may be mistaken for corporate philanthropy and donations (Cutlip et al., 2006), a good CSR strategy may also strategically shape the corporate identity of the company. Laudal (2011) argues that companies engage in CSR when they integrate social and environmental concerns into their business operations and, thereby, improve human welfare and fulfill or exceed the requirements of international CSR standards.

However, in our view ‘responsibility’ in both RRI and CSR has lost meaning as a standard against which differentiation can be made between good and bad activity (Ribeiro et al., 2018; Wisser, 2012), therefore hindering progress towards generally more responsible aggregate outcomes. Further, RRI has stalled at the point of articulating a process of governance with a strongly normative loading. The principles of RRI direct us to involve the user early in the innovation process. However, it lacks direction of how to involve patients in particular in health and welfare sector. This project suggest developing a methodology to listen to and translate the user voice into clues for the front end of innovation.

Finally, there is a tendency for technology actors to dominate social actors in responsibility processes, reducing the ‘citizen’ to one common actor because of the difficulties of translating messy social voices. Arguably, a radical transformation of CSR would involve principles like creativity, scalability, responsiveness and locality (Wisser, 2012). By engaging an eco-system in the co-creation of innovations, which create both social and commercial value, we would develop a template for RRI that offering the potential for creating radical innovations, which have significant economic potential and fit the core strategy of enterprises involved.

If the promise of responsibility in RRI and CSR is to be realised and to unleash a real transformation, there is a need to: (i) listen to citizens directly and allow them to articulate their own values as the basis for innovation processes (ii) stimulate the development of innovations that incorporate citizens’ value judgements on a basis of mutual respect. (iii) develop standards and measures that hold other partners to account based on these articulated citizen values. By understanding the above principles, we can develop and extend the RRI and the CSR frameworks to make them accessible and useful tools for practitioners.

4. Tasks, approaches and methods
The present project will consist of four work packages described below. We employ diverse methods, including surveys, interviews, longitudinal case studies and action-based methods (interventions) in this project.

WP1. Understanding user’s side
In the first part of the project we will elaborate and populate our ‘spectrum model’ of user engagement, including informed, involved and innovative users, identified in our prior project (Iakovleva et al., 2019; Bessant et al, 2017). We aim to answer following RQ: What are attitudes, concerns and expectations of users in relation to welfare technology? This knowledge will help to coordinate, channel, and orchestrate latent user knowledge and interests to create coherent innovation demands. We will draw upon a multidisciplinary stream of literature on attitude-behaviour relationship models (Perrugini & Bagozzi, 2001), business ethics and corporate social responsibility (DesJardins, 2014; Sen, Du, and Bhattacharya, 2016), and consumer trust (Doney and Cannon, 1997; Morgen and Hunt, 1994) to explore and identify potential users’ expectations and concerns related to usage of new digital health-care solutions in welfare sector.

In this WP we choose to concentrate on the elderly population. This growing group are seen as most urgent from the Grand Challenges perspective. As estimates suggest, if the current trends for care do not be changed, Norway will have to triple the number of people working in the care sector (Bygstad and Lanestedt, 2014). Thus, many digital solutions are targeted toward this population.

Table 1 Tasks, methods and deliverables WP1

<table>
<thead>
<tr>
<th>Task</th>
<th>Method</th>
<th>Deliverable</th>
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<tbody>
<tr>
<td>Identify attitudes, concern, expectation of users of welfare technology</td>
<td>(1) in-depth interviews with representatives of the elderly population (65-85 years), 20 interviews</td>
<td>Tacit knowledge to integrate to survey</td>
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<td></td>
<td>(2) survey of representative sample of stakeholders - elderly population (65-85), relatives of those, respondents in the age 60-65, 1000 respondents in total (in collaboration with the Pensioner Union), Telefone surveys based on structures questionnaire</td>
<td>Knowledge about attitudes, concerns, expectation and behavior of users</td>
</tr>
<tr>
<td></td>
<td>(3) ‘serious gaming’ process (Deterding et al., 2011) by allowing ‘pitching’ innovative ideas to a panel of users informed from survey (several interactions) during the “hackatone” events organized by Valide</td>
<td>Anticipation of stakeholders needs as ‘orchestrated voice’ in the front end of innovation process</td>
</tr>
<tr>
<td>Develop and test methods of integrating their ‘voices’ in ‘front end’ of innovation process</td>
<td>(4) employment of techniques as design thinking, empathic design, storytelling, patient journey, constructive technology assessment</td>
<td>Scientific papers and knowledge sharing</td>
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<tr>
<td>Codify obtained knowledge into replicable methods with documented results</td>
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**WP2 Creating boundary innovation space (the SIF-Lab)**

In this WP we aim to answer following RQ: *How to create a boundary innovation space to activate user driven or user-inspired innovations?* This part of the project involves establishing a working space - the Shared Innovation Futures Lab (SIF-Lab) within which multiple stakeholders work together with users and potential users to help articulate their ideas and co-create the innovative solutions. It will draw on ongoing process within NSCC and will be based on existing experiences of Innovation Labs and Living Labs around the world and emerging best practices within them, and will offer a ‘boundary space’ within which articulation, prototyping, pilot and scaling activities can take place, in parallel with development of inclusive business models.

Our previous findings indicate that users are often involved as an afterthought (firms tend to close their innovation window too soon and so this can increase the costs of user involvement), or very selective/opportunistic in terms of the number of people approached, or they can have a different perspective, not the profit but the dignity (Oftedal and Foss, 2019; Silva et al, forthcoming). In this WP we will explore ways to involve users more systematically and in more co-ordinated fashion, to improve the interaction pathways to better involve the user voices in the innovation process. Situating ourselves in the learning community which has emerged around the Norwegian Smart Care Cluster (NSCC), we will be active in foregrounding the issues of user interest in the experiments within the lab. NSCC includes 115 companies and 45 municipalities. It focuses on research, innovation and business development in Smart Care (eHealth, mHealth, integrated care, health ICT and related smart care disciplines) as a means of improving health and homecare services. NSCC with Norwegian Smart Care Lab (NSCL) is a part of HelseCampus Stavanger- a new physical facility, a new meeting place for sharing experiences, research, and innovations across professional environments with different stakeholders – municipalities, hospital, ambulance and others are present. This physical space for testing and prototyping already in place from September 25th 2019, and we will secure the development of techniques that NSCL will apply to enhance their work on user inclusion into innovation process.

In this WP we will also work closely with the Citizen Lab in the Netherlands. The TechMed Centre of the University of Twente, in collaboration with health organizations, patient organizations, municipalities and employer’s organizations, is in the process of setting up a Citizen lab aimed at facilitating the co-creation of innovations for healthy living, taking the situation and perspective of citizens as the starting point. We will also gain insights from other Innovation Labs such as UnternhemerTüM in Munich, Germany and the Fraunhofer ‘Josephs’ Lab in Nuremburg, Germany, where Professor John Bessant has a consulting position.

*Table 2 Tasks, methods and deliverables WP2*

<table>
<thead>
<tr>
<th>Task</th>
<th>Method</th>
<th>Deliverable</th>
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<tbody>
<tr>
<td>Identify suitable techniques and methods for user inclusion in different Labs</td>
<td>(1) studying ‘best practices’ of user involvement by literature review, by observing in-depth emerging Labs in Stavanger and Twente, by visiting established Labs in Munich and Nuremberg</td>
<td>Overview and evaluation of techniques and tools applied in different context</td>
</tr>
<tr>
<td>Develop suggestion for intervention</td>
<td>(2) based on (1) and on inputs from WP1 develop a set of techniques suitable for implementation in Labs in Stavanger and Twente</td>
<td>‘design specification’ for an ‘innovation space’ to help to accelerate user involvement development of a robust template for wider use by innovative firms interested in developing more inclusive approaches to working with users in social healthcare innovation, scientific publications, knowledge dissemination</td>
</tr>
<tr>
<td>Intervention: take in use techniques</td>
<td>(3) develop a prototype of digital web-based solution in Stavanger Lab to allow to recruitment and communication with users who will be testing innovations developed by the members of the NSCC, Citizen Lab or other collaborative partners</td>
<td></td>
</tr>
<tr>
<td>Codify obtained knowledge into replicable methods with documented results</td>
<td>(3) implementation of techniques suggested in WP (2), tests digital portal</td>
<td></td>
</tr>
<tr>
<td>(5) Analysis and description of methods and techniques used</td>
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**WP3 Enabling the ecosystem**

In any innovation ecosystem there are two key questions – are all the relevant players represented and do they work well together? We aim to answer following RQ: *How to enable the eco-system to ensure diffusion of responsible digital innovations in welfare sector?* This WP identifies motivations of different stakeholders within the eco-system and suggest collaborative business models for “free innovation”, in particular it will
assist user-inspired innovative micro businesses (Oftedal et al, forthcoming 2019; Konrad et al. forthcoming 2019) to generate value in collaboration with system providers, municipalities and healthcare providers to generate socially desirable outcomes. The underpinning research around the theme of ‘free innovation’ (von Hippel, 2005; 2016) sees a partnership between engaged users on the one hand and established ‘producer’ organizations on the other. Engaged users contribute ideas, insights and prototyping and give access to ‘sticky’ information about compatibility issues likely to affect downstream adoption and diffusion. This information reduces the uncertainty and risk associated with exploring novel markets by innovative firms. ‘Producer’ organizations contribute expertise in scaling up, in mobilising critical resources and charting a pathway to market. The emerging collaborative business model is a ‘win-win’ arrangement, which builds on the complementary strengths of both sets of players.

For RI to take place it is imperative to both retain the citizen/user interest in the innovator trajectories via connecting the different “codes of knowledge”. It requires the ability to demonstrate an understanding or the different perspectives and requirements of all stakeholders. Therefore, WP3 aims to identify the conditions under which responsible innovation and user interests can be retained in the procurement processes in the innovation eco-system. These procurement processes are an entanglement of laws and regulation, norms and procedures and established knowledge that are forming an “institutional wall” (Oftedal and Foss, 2019). The institutional wall is effective in filtering the new products and services that are arriving to secure a reliable, predictable resource for the user. It may also cement old norms and knowledge and locks them into different “codes of knowledge” depending on their position in the ecosystem. As such, the wall also may effectively hinder improved products and services. Drawing on the innovation trajectories and citizen perspectives mobilised in WP1 and methods developed in WP2, WP3 will develop a viable platform environment for stakeholders and businesses to support a user-centred mode of co-creation in innovation within this eco-system.

**Table 3. Tasks, Methods and Deliverables WP3**

<table>
<thead>
<tr>
<th>Task</th>
<th>Method</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand social and economic value of innovations for eco-system payers (system integrators, original equipment manufacturers, healthcare works in municipalities)</td>
<td>(1) Ecosystem fieldwork (interviews, stakeholder analysis and participant observation) within Stavanger and Twente Labs. Learnings from WP1(users) and WP2 (innovative firm) will be integrated</td>
<td>Knowledge about challenges and opportunities eco-system players associate with innovation</td>
</tr>
<tr>
<td>Develop methods of accessing social, economic and environment value of innovations</td>
<td>(2) Suggesting evaluation criteria for innovations that would help clarify social, economic and environmental values</td>
<td>Set of indicators for assess ‘triple’ value of innovation</td>
</tr>
<tr>
<td>Develop value models for creating constructive partnerships</td>
<td>(3) Suggesting ‘shared value’ business model for partnership</td>
<td>Scalable model of cooperation between innovative firm that incorporate user voices, and broader eco-system (system integrators, municipalities etc.)</td>
</tr>
<tr>
<td>Intervention: take in use assessment tools and new partnership model</td>
<td>(4) implement suggestions from (3) and (4)</td>
<td></td>
</tr>
<tr>
<td>Codify obtained knowledge into replicable methods with documented results</td>
<td>(5) Analysis and description of methods and techniques used</td>
<td>Scientific papers and knowledge sharing</td>
</tr>
</tbody>
</table>

**WP4 Open learning arena**

This WP deals with dissemination of results and transfer knowledge to other sectors via collaboration with national virtual RRI centre. It facilitates learning across international and national research partners, stakeholder groups of this project and with other communities of RRI and CSR researchers, businesses and policymakers. The present project is based on generating knowledge not only though pure research, but also via action-based approach based on intervention with patients, entrepreneurs, system integrators, healthcare organizations, municipalities, investors, regional clusters and other actors. We wish to make the whole process of such interventions, including techniques and tools applies during this process, open and applicable in other fields and sectors. We believe that techniques for user involvement, methods for integrating their voices into early design space as well as throughout the innovation process are universal and applicable in any sector. Moreover, development of “free innovation” business model based on eco-system approach can be also useful in many other context.
In order to ensure the transferability of knowledge, we suggest a series of three two-day workshops at each “reflective” stage of our three WP. These workshops will be open for partners and their stakeholders in the national virtual RRI centre. On the first day, the progress of research will be reported, including analyses and reflection on tools and methods applied for interventions. On the second day, participants will practice the innovation tools. For each of three workshops the focus would be on 1) getting the user voices 2) integrating for innovation and 3) free innovation business models. This workshops may be intergared into WP2 “laboratories for RI” of the AFIOS prosjekt (national hub project). Further, we will contribute to the WP 3 “The AFINO research school” by providing a module of user-inclusion in innovation management.

Table 4. Implementation plan

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
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<tbody>
<tr>
<td>Quarter</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

WP1 Understanding users side
- Interviews with users
- Survey of users
- Intervention: Serious gaming
- User involvement techniques, review/trials
- Reflection

WP2 Innovation space (the SIF-Lab)
- Review of Living Labs practices
- Developing methods for ‘shared innovation space’
- Development of digital solution
- Intervention: implement methods and digital solution suggested
- Reflection

WP3 Enabling the ecosystem
- Ecosystem fieldwork (interviews, stakeholder analysis)+inputs wp1,2
- Develop new value models for “free innovation”
- Intervention: taking in assesment tools and new partnership mod
- Reflection

WP4 Open learning arena
- Open workshops with stakeholders, national virtual RRI centre
- Module for research school

5. Organisation and project plan

Data collection are to be performed in accordance with the implementation plan. Daily management and knowledge sharing will be performed through quartile skype video sessions, annual workshops/conferences, by field visits abroad and by constant updates of the project web-page. University of Stavanger team is also responsible for data management plan (DMP). The project will include two PhD students (one subject to RCN funding and another own-funding) and one postdoc (Netherlands).

Table 1: Project organization and cooperation*

<table>
<thead>
<tr>
<th>WP</th>
<th>Title</th>
<th>National research partners</th>
<th>International Research partner</th>
<th>Supporting partner/User</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP1</td>
<td>Understanding users side</td>
<td>Leader: Chunyan Xie (HVL) Paul Benneworth (HVL) Tatiana Iakovleva (UiS) PhD candidate 1</td>
<td>Helena Conhao (NOVA Medical School, Portugal) Richard Bagozzi (University of Michigan, USA)</td>
<td>The Pensioners’ Union NSCC (Valide)</td>
</tr>
<tr>
<td>WP2</td>
<td>Innovation space (the SIF-Lab)</td>
<td>Leader: Elin Oftedal (UiS) Elisa Thomas (UiS) Tatiana Iakovleva (UiS) Paul Benneworth (HVL) PhD candidate 2</td>
<td>Pedro Oliveira (Copenhagen Business School, Denmark) John Bessant (Exeter, UK) Kornelia Konrad, Klaasjan Visscher, post-doc (University of Twente, Netherland)</td>
<td>NSCC (Valide), Citizen Lab (Netherland), UnternehmerTUM and Fraunhofer “Josephs’ Lab (Germany)</td>
</tr>
<tr>
<td>WP3</td>
<td>Enabling the ecosystem</td>
<td>Leader: Tatiana Iakovleva (UiS) Participants Elisa Thomas (UiS) Thomas Laudal (UiS) Elin Oftedal (UiS) Paul Benneworth (HVL) PhD candidate 2</td>
<td>John Bessant (Exeter, UK) Kornelia Konrad, Klaasjan Visscher, post-doc (University of Twente, Netherland)</td>
<td>NSCC(Valide), stakeholders: Atea, Siemens, Sensio, Norengros, Innocom, The Pensioners’ Union, Stavanger, Randaberg, Klepp municipalities, Citizen Lab and their stakeholders (Netherland)</td>
</tr>
<tr>
<td>WP4</td>
<td>Open learning arena</td>
<td>Leader: Elisa Thomas (UiS)</td>
<td>All research partner</td>
<td>NSCC and all stakeholders,</td>
</tr>
</tbody>
</table>
The project is delivered by a team with substantive international expertise in RRI and CSR in the field of welfare technologies. Many members of our consortium participated in DoD project, contributing to the academic outputs, as well as having substantive RRI publishing records of accomplishment in their own right. An important element of the internationalisation of the project is drawing on international experts to support the practical interventions within the framework of supporting user-led innovation in all three major project work packages. We also use national and international scientific panel to ensure quality and enhance dissemination in this project.

Project leader, Professor Iakovleva, has broad experience from managing several projects funded by RCN and RRC, including “Digitalize or Die” (DoD) project (NRC, Samansvar program), which successfully identified innovation pathways for implementing health and welfare technologies. Iakovleva has over 45 publications in peer-reviewed international journals and books, and is an editor of a forthcoming book “Responsible Innovation in Digital Health: Empowering the Patient” (forthcoming July 2019 with Edward Elgar Publisher), together with Oftedal and Bessant, who are also partners in the current application.

In WP1 we have two researchers from Western Norway University of Applied Sciences (HVL) as well as assistant researcher involved. Professor Benneworth has participated as a co-investigator in RCN-funded DoD project and Idélab network, as was involved in around 60 funded research and consultancy projects. Benneworth’s expertise is within research policy and networking for RRI. We have added expertise in corporate governance, consumer research and CSR by collaborating with Professor Chunyan Xie from the same institution, who will lead this WP. Iakovleva will participate in WP1 as well as a PhD student. Helene Canhao, a physician and professor of Medicine, cofounder of the Patient Innovation Platform, who has undertaken a nationwide survey of patients in Portugal regarding patient innovativeness and participated in DoD project, will act as international expert. She will guide on the development and analysis of the user survey. Professor Richard Bagozzi from Michigan University, with expertise in consumer-based research and CSR, will also join with valuable advice. We collaborate with The Pensioners’ Union to run survey and with NSCC to make user-games and interventions.

WP2 will be led by dr. Elin Oftedal who holds her main position in Arctic University of Tromsø and will be connected by a bi-position to UiS. Dr. Oftedal is one of major contributors in DoD project, co-editor of the coming book on Responsible Innovation in Digital Health and has deep expertise in entrepreneurship and innovation field, with a focus on commercialization activities. She will guide a team of UiS and HVL researchers with relevant expertise, including Dr Elisa Thomas who researched on knowledge types and collaboration, Dr Benneworth, Dr Iakovleva and two PhD students. This WP have comparative design with Netherland, thus Dr Konrad from Twente University, who earlier collaborated in DoD project, and her two colleagues with relevant expertise in transformative CSR and STS will join forces. Dr Konrad and colleagues have studied the role of users and user-led innovation in the development and implementation of eHealth and other digital applications and developed tools for facilitating RRI in technology research and development. We utilize expertise of such international experts as Dr Pedro Oliveira, professor of innovation at Copenhagen Business School, founder of the Patient Innovation Accelerator. Dr Oliveira has extensive experience in patient-led innovation processes; he will provide guidance on supporting firm innovation/growth for patient-led innovation. We will collaborate with NSCC and their innovative firms in Norway and Citizen Lab in Netherland, which allows interventions, and will visit and observe Labs in Germany for best practices.

Professor Iakovleva leads WP3 in collaboration with colleagues Dr Thomas Laudal, who was a part of DoD project and has expertise in particular on transformative CSR and large corporations, Dr Elisa Thomas, Professor Benneworth and Dr Oftedal. This WP has as well comparative design with partners from Twente University and in addition utilize expertise of Professor John Bessant: professor of innovation at Exeter University (UK) with a second position at UiS. Bessant has extensive experience in research and consultancy to large innovative companies in innovation and RI field; he will provide support on understanding the innovation needs of the system integrators to assist innovative firms to sell to these large firms. We will collaborate with NSCC and a range of system integrators and other stakeholders in eco-system in Norway and our Netherland partner will collaborate with Citizen Lab and their partners.
WP4 is led by Dr Elisa Thomas with support of all research and collaborative partners and will establish collaboration with national virtual RRI centre. In particular and to secure the later, we will recruit national expert panel from national virtual RRI centre. This panel will meet 3 times during the life of the project (during regular project meetings) to attune the project direction and findings to the wider network and to maximise its contribution to the national knowledge base.

An international expert panel whose role is to ensure quality of the research as well as to help disseminate findings supports our consortium. Professor Jill Kickul (USC, US) with a specific expertise in social entrepreneurship and a Director of USASBE organization (US Association for Small Business and Entrepreneurship), dr. Barbara Ribeiro (Manchester University, UK), who has expertise in RRI field, Professor Per Davidsson (Queensland University, Australia) with expertise in digitalization and entrepreneurship and influential role in Academy of Management community.

6. Costs incurred by each research-performing partner (NOK 1 000)
This overview is presented in the project specification (table cost plan). Research partners in this project were described in section 5 while other partner described in section 7.

7. Other collaboration
Apart with collaboration with NSCC who also contribute with own resources into this project, we have many supporting partner that confirmed their participation in the project.

Established Organization: Bridge, Investor, Collaborator: Atea. With 7,200 employees and 4,000 consultants located in 87 offices across seven countries. Atea is an important system integrator in the health sector Sensio. Sensio is the leading provider of welfare technology and helps more than 160 large and small municipalities with quality and efficient operation of their care services, while providing comfort and security in the thousands of homes. Norengros is a nationwide chain of 13 companies with local owners, with 40 wholesale store and is Norway's largest supplier of consumer goods. Its comprehensive product range includes welfare technology and e-health products. Siemens. With 360,000 employees in more than 190 countries, the company uses digitalization to further improve the electrical and automated solutions.

User-Groups organizations: The Pensioners' Union is an organization that works to give the country's pensioners a clear voice. Union engage in the areas of health, finance, culture, security and accessibility, in matters that matter to your everyday life as a pensioner.

Municipalities: Stavanger, Randaberg, Klepp The municipalities are responsible for providing good and sound health and social services to everyone who needs it, regardless of age or diagnosis.

Living Labs: UnternehmerTUM offers founders and start-ups a complete service, from the initial idea all the way to IPO. A team of experienced entrepreneurs, scientists and managers supports founders with the development of their products, services and business models. The experts accompany them actively with building up their companies, market entry and financing – also via Venture Capital. Citizen lab is part of the ‘Societal Impact’ strand of ‘TopFit’, a regional open innovation programme in the health cluster in the Eastern part of the Netherlands, linking universities, medical hospitals, a cluster of companies in health technology, care providers, insurances, municipalities and other actors from the health sector.

PART 3: Project impact

8. Importance for national knowledge base
Norway is working at the frontier of innovative and responsible health care. Its unique social compact with its inclusive welfare provision is a source of strength but it also depends on successfully adapting to new technological opportunities and threats. If welfare technologies develop solely on the basis of technological possibilities rather than societal preferences, then this risks damaging the necessary consensus for mass welfare provision. In the past the inclusive nature of Norwegian society has meant that has been a satisfaction with the delivery of mass welfare products and services, but the increasing need for tailoring to individual needs and the widespread introduction of new technologies creates a risk that the shift towards e-health might unwittingly drive social inequality and lead to social disquiet. Our project addresses this by creating conceptual understanding and practical tools to better incorporate citizen voices into innovation processes in digital health.

We will develop a methodology for incorporating mass user interest into welfare innovation, which in turn facilitates its absorption and uptake by system-integrations and broader eco-system in welfare sector. This methodology has two elements; (1) a demonstration facility, which will show how to enhance eco-system to integrate voices of users, small and start-up entrepreneurs, system integrators, municipalities and healthcare professionals. (2) a set of scalable techniques, which will allow the wider implementation of more inclusive and responsible innovation in welfare technologies. Thus, addressing a substantive lacuna in welfare
technology innovation Norway will continue to develop basic and applied knowledge in this field, as well as enabling it to benefit from its implementation of innovation.

In addition, this project will make a useful contribution to moving a theoretical discussion around CSR/RRI forward. By engaging an eco-system in the co-creation of innovations, which create both social and commercial value, we hope to develop a template/prototype for RRI that tries following the principles of creativity, scalability, responsiveness, glocality and circularity. The participating Norwegian universities (UiS and HVL) have all placed responsible research and innovation at the heart of their innovation strategies, and will embed it in their teaching and research activities. RRI is one of the two strategic foci of the UiS Centre for Innovation Research, and the findings from the project will be incorporated into the existing innovation Ph.D. programme at UiS. HVL have recently been awarded a new Doctoral Training programme on Responsible Innovation and Regional Development, and Professor Benneworth is leading this training programme for the Faculty of Economics and Social Sciences;

The project will also be embedded within Norwegian RRI research. Both Norwegian universities are engaged with the construction of the new NRC-funded national virtual centre for RRI Research. We will work with this centre to identify 3 national experts within the wider network to constitute a national advisory group; We will also make the Demonstrator project open to other centre participants (for example as a site for further research) and actively share the emerging knowledge within the centre network through suggested activities in WP4.

9. Relevance for Norwegian industry

The Norwegian R&D-based industry supplying new healthcare solutions comprises approximately 500 companies with about 15,000 employees. The total turnover is around 30 billion NOK, thus constituting an important industry for Norway. This project has been designed in close collaboration with innovative SMEs from the NSCC, addressing specific challenges in moving digital innovations to market. Providing a tool to help bridge the gap between proof-of-concept and pilot-implementation and scalable growth by incorporating user voices, articulating social, economic and environmental values of innovations to stakeholder in ecosystem will be a valuable contribution. The project develops new reporting standards and a whole-supply chain solution to centre users in welfare technology innovation processes, from aggregating user preference signals to corporate reporting and recognition of user-centric CSR. This approach has potential applications outside the welfare sector, and its wider deployment via upscaling will allow Norwegian industry to better respond to user needs in developing responsible innovations, and reporting that responsibility within corporate governance frameworks. This can position Norway both as a leading responsible innovator but also help to stimulate wider global change (and position Norwegian industry to preferentially benefit from that change). This will be delivered by showcasing potential corporate governance innovations that can help drive CSR through RRI and creating Norway as a centre of knowledge excellence in that change.

Benefits to major stakeholder are outlined in the table below:

<table>
<thead>
<tr>
<th>Innovative firms</th>
<th>assisted to upscale by providing them with tools to articulate their wider societal value in terms of their improved fit with user needs as an antecedent to wider uptake (and greater sales).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipalities</td>
<td>supported to reduce their long-term costs whilst sustaining and improving health care in terms of affordability, availability and efficiency.</td>
</tr>
<tr>
<td>Systems integrators.</td>
<td>equipped to better articulate how engaging with patient-led home care technology businesses contributes to their overall corporate social responsibility</td>
</tr>
</tbody>
</table>

PART 4: Other aspects

10. Other socio-economic benefits and contribution to sustainable development in society

The primary socio-economic benefits from this project come from the contribution to Norwegian social cohesion, specifically by addressing the tensions that the increasing drives to find technological solutions to spiralling welfare budgets place on the Norwegian societal compact. There are benefits for recipients of social care in that they are able to influence the development of the technologies that will ultimately provide welfare services to themselves and their loved ones. There are benefits for employees in the Norwegian healthcare sector in providing them with an arena to shape the technologies that will ultimately affect their working environment. The project will also contribute to a) delivering gender equality by helping to improve workplace dignity and control in a working environment dominated by female employment. b) building responsibility repertoires and standards within Norwegian welfare technology businesses. c) realise the National Government’s intentions in the 2012 welfare reforms to cut costs and for Norwegian municipalities to deliver the best welfare solutions for long-term care residents. d) addressing the Sustainable Development Goals.
comes through SDG 12.6 (Sustainability reporting) and 12.A (R&D for sustainability), although there is clearly a contribution to SDG 3.8 (access to healthcare). The corporate governance mechanisms for responsibility are currently extremely weak and revolve around corporate philanthropy rather than being able to reward more responsible behaviour directly. This project seeks to better understand how corporate innovative supply chains can be better coordinated towards the delivery of responsible welfare solutions. This will provide a template for understanding those governance/coordination mechanisms and also for how corporate governance observers (e.g. pressure groups) can seek to shape action to encourage more responsible behaviour by the system integrators whose input is essential to deliver widespread societal transition in support of the SDGs.

11. Dissemination and communication

Specific plans for scholarly and popular science dissemination activities are outlined in the electronic grant application form. In short, the project will generate 10 scholarly publications in high-ranked international journals (including open access journals), in addition to numerous conference presentations and popular science presentation. An edited book with tentative title “Releasing the power of patients – towards innovative eco-system in healthcare and welfare services” will allow us to explicitly show the breadth and complexity RI issues with focus on user involvement across countries and will suggest best practices for policymakers as well as practitioners. Dissemination will happen as well via web page, and in collaboration with national virtual RRI centre and through specifically designed workshops to involve different stakeholder, described in WP4.

12. Ethical perspectives and gender issues

The data for this project will be collected from members of The Pensioners’ Union, from firms in the e-health sector, from municipalities. The project will be reported to the Norwegian Social Science Data Services (NSD) and Regional committees for medical and health research ethics (REK) before starting the empirical fieldwork. Data will be handled in line with the principles laid down by the National Committee for Research Ethics in the Social Sciences and the Humanities (NESH). The Norwegian research team has an equal number of female and male members. The project leader is female. When recruiting informants and respondents, the project will ensure inclusion of both men and women. The project will also contribute to delivering gender equality by helping to improve workplace dignity and control in a working environment dominated by female employment.

References

Iakovleva, T., Ofredal, E. and Bessant, J. (forthcoming July 2019) Responsible Innovation in Digital Health: Empowering the Patient, Edward Elgar Publisher