Responsible-Industry

GA 609817

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Authors	Emad Yaghmaei Alexander Brem	2nd Revision Date:	11.11.2014
Contributors	Bernd Carsten Stahl Michael Obach Veikko Ikonen	3rd Revision Date:	11.12.2014
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Case Study Protocol - Work Package 3 – Analysis, Reflection and Recommendations

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1. Introduction

The nature of research question(s) is probably the most fundamental rationale behind choosing right research method (Yin, 2009). In essence, research question(s) should be traced over time in dealing with studies operational links. For contemporary research areas where we have relatively little knowledge about the topic as well as adequate literature with profound practical experience is missing, investigation on that phenomenon within its real-life context in-depth through a concrete research question would be suggested (Yin, 2009). In these cases, theory building from case study research is an appropriate way to create a theoretical basis using empirical evidence (Eisenhardt and Graebner, 2007). In other words, the case study method is used when we are seeking to understand a real-life phenomenon in-depth to distinguish the boundaries between that phenomenon and context clearly (Yin, 1981). In light of this issue, since both phenomenon and the context are highly pertinent to each other, understanding fundamental contextual conditions helps to carry on designing case studies and distinguish this method from the other research methods. Hence, the logic of design is covered in case study research method.
In addition, nevertheless case studies and other research methods may overlap, the case study unique position is secured as it could be dealt with a full variety of evidence – documents, artefacts, interviews, and observation- beyond what might be investigated in the other research methods. To highlight case study position, one may imply other technical characteristics of case study including data collection and data analysis strategies in which they contribute to clarify the boundaries between phenomenon and the context in real-life situation more clearly.
Furthermore, the interpretive perspective in case study research method provides the inductive research of connecting theory and data, relies on multiple source of evidence, and guides data collection and analysis strategies. That means the aim of the researcher should be to build the theory from the generated data by detecting patterns within the findings and afterwards hypothesize, which is consistent with case study research (Farquhar, 2012).
Collectively, the case study research covers the logic of design, follows data collection techniques, and conducts specific data analysis approaches to study on a contemporary phenomenon in depth within its real-life context, which all these aspects fit to our study aims when we are seeking to address how to implement the contemporary phenomenon of responsible research and innovation (RRI) along the value chain of information and communication technology (ICT) for health, demographic change and wellbeing.

Putting all argument together we are going to choose case study research as our main method to study on this project. The purpose of this report is thus to design a robust case study protocol with its relevant guidelines (action plans) for applying during the responsible-industry project to collect, present, and analyze data fairly in domain of ICT for health, demographic change and wellbeing. A further focus of case study protocol in this project is to provide the necessary academic rigor to record, analyze and synthesize the comparative cases to assess the value of the RRI implementation plan. It defines the information that needs to be gathered from the cases, the way this data is to be analyzed and the processes

of reflections to be undertaken. The step of rigorous scientific observation and analysis is necessary to demonstrate potential benefits for industry at large to follow up on such an example. Moreover, case study protocol tends to offer an excellent basis for further qualitative research on RRI implementation plan in industry.

Case Study Protocol

The process of conducting a case study protocol in WP3 includes major process steps covering different design components, which provides an overview of the process of building theory:

- **Case study design:** Objectives of study and research questions are defined and case study is getting started
- **Data collection design:** procedures and protocols for data collection are defined, unit(s) of analysis is/are specified. Case selection criteria are determined. In addition, plausible data collection tools are considered.
    - ✓ **Collecting evidence:** The logic linking the collected data to the RRI implementation plan is identified.
- **Analysis of collected data:** After collecting data from each individual case, cross-case pattern would be applied besides using divergent techniques to interpret the findings and analyze data.
- **Reporting:** Conclude and report

Such process must have a flexible design strategy where a numerous iteration steps are applied to reach theoretical saturation and assess the value of the set of outcomes from WP1 and WP2, in essence assess the value of the project implementation plan.
Accordingly, this work reflects the guidelines for conducting case studies from the outset of case study research to the final point.

The purposes of below checklists are to guide readers in determining when, where, and how case studies activities are fulfilled and who is responsible for those. Items that be considered
(1) Case study design (2) Data collection (3) Data analysis (4) Case study reporting

2. Case Study Design

The Responsible-industry case study protocol design contains a set of activities, instruments, procedures, and general rules, which we will describe in subsequent tables. In essence, case study design assists us to protect objectivity by providing explicit descriptions of the steps to be taken. Such design contains information on the specific questions addressed by the study, the case(s) that is the focus of the study, the search strategy for identification of relevant studies, and the criteria for inclusion and exclusion of studies in the review (Davies and Crombie, 2000). Moreover, SDU as work package leader collaborate with consortium partners to review the protocol design during its preparations. Consortium review on case study design will mitigate the risk of missing relevant data sources, optimize interview

questions, and address specific roles to include in the research to assure concrete relation between research questions and interview questions. Such feedbacks also seek to integrate WP2 implementation plan into case study design. Finally, to address changes during the research project accurately and track them accordingly, the case study design would be monitored regularly to avoid any mistakes.
We will categorize key findings and the overall focus of the case study design and will summarize a set of items related to protocol design in subsequent tables. The following table illustrates different sections of protocol design. Consequently we elaborate each section separately in its pragmatic manner as well as conduct a Gantt chart as an appendix to provide an action plan for implementing each step that be used by partners involved in task 3.1 (TECNALIA, VTT, DMU, and SDU).

Item	Case Study Protocol Design Checklist Items	Lead partner (leader in bold)	Target month
1	Clear objectives, preliminary research question and hypotheses (if any defined) are set	SDU	M8
2	What are case(s) and its units of analysis? The unit(s) of analysis, including holistic and embedded unit(s) of analysis are defined	VTT, TECNALIA, DMU and **SDU**	M12
3	Contextual events surrounding of these units are defined	SDU	M8
4	Theoretical basis of cases based on existing literature are defined	SDU	M8
5	Invitation letter for participants/candidate cases is conducted	TECNALIA	M11
6	The rationale behind the selection of case(s), subjects, roles, viewpoints, etc. are set	VTT, TECNALIA, DMU and **SDU**	M10
7	Cases are adequately defined in terms of [size, domain, process, subjects, etc.]	VTT, TECNALIA, DMU and SDU	M12
8	If we have any cause-effect relation to the study, we identify cause-effects and distinguish from other factors	SDU	M12
9	Case study design will be embedded by multiple data sources (triangulation) & using multiple methods (method triangulation)	VTT, TECNALIA, and SDU	M12
10	Case study tactics for the quality of research designs are addressed	SDU	M12
11	Integrity of individuals/organization, quality and transparency are noted	SDU	M12

Table 1: Case study design checklist

Case Study Design Checklist

Research question(s), objective(s), and hypotheses
Description
The study objective is how to implement RRI along the value chain of ICT for health, demographic change and wellbeing. This main research question would address along the whole project.
Activities
Qualitative methods literature review by SDU; case study research literature review by SDU; clear objective(s), preliminary research question(s) for WP3 are set
Plan Duration
M1-M8
Which partners are involved? (-led in bold)
SDU

Case(s) and its units of analysis
Description
What are case(s) and its units of analysis? In principle, the embedded unit(s) of analysis would take within WP3. Embedded case studies design, where multiple unit(s) of analysis is studied within a case, is our choice to take for case study protocol. In essence, we look up at four ICT companies as protocol cases while we are seeking to study on four distinctive projects under those companies as units of analysis. All projects, obviously, are in the area ICTs for health, demographic changes and wellbeing sector.

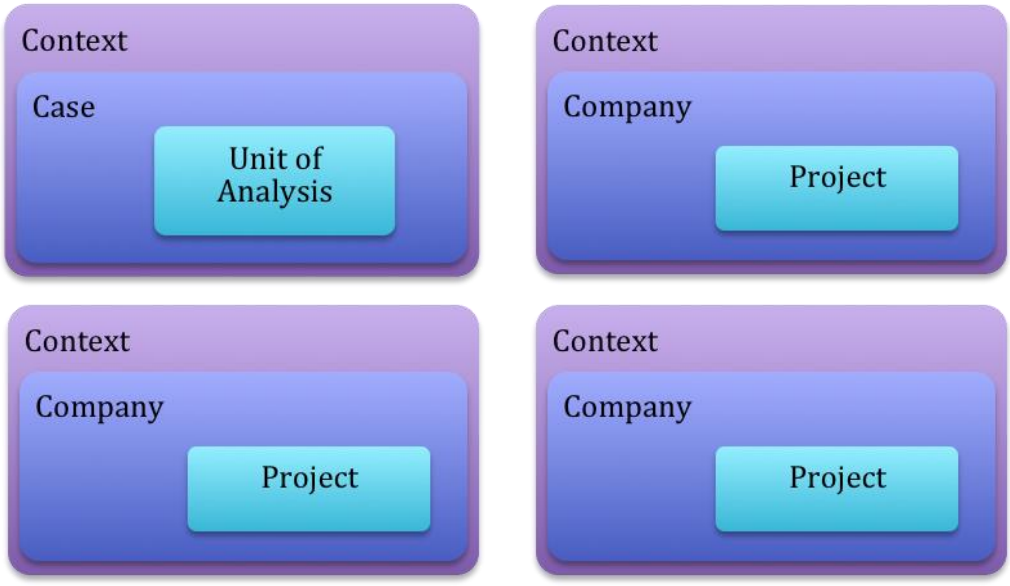

Figure 1: Context: ICT domain for health, demographic changes and wellbeing
Case: ICT companies
Unit of Analysis: an ICT project inside of cases

Since the eligible number of case/units of analysis candidates is large, three-stage screening procedure are taken. The first round of screening holds by VTT and TECNALIA internally to choose candidate cases through their archival source based on primary criteria list.

VTT candidate cases:

- Case 1 - Bewell Cluster
- Case 2 - Actimage
- Case 3 - Kaukomarkkinat
- Case 4 - Mikkelin puhelin
- Case 5 - Alkit

TECNALIA candidate cases:

- Case 1 - Xsens
- Case 2 - Odei S.A.
- Case 3 - IBERNEX
- Case 4 - UNO-LUX NS
- Case 5 - BTS S.p.A.
- Case 6 - Atos Spain S.A.

The second and third round of screening upon cases and units of analysis are set to reduce the number of candidate cases as well as units of analysis to four real cases, one pilot case, and two alternative cases, which will be fulfilled by rigorous criteria method and review by all Responsible-industry partners. In addition, of course, choosing ultimate cases / units of analysis depends on their willingness to engage with in order to assess the RRI implementation plan.

Activities
Define a set of operational criteria for case selection by SDU; select qualified case study candidates by VTT and TECNALIA through first round of screening procedure; apply second round of screening procedure by peer-review of all consortium partners to select final four real cases, one pilot case and two alternative cases by TECNALIA, VTT, and SDU
Plan Duration
M1-M12
Which partners are involved? (-led in bold)
VTT, TECNALIA, DMU, and **SDU**
How will the activities be accomplished?
Use a multiple-case design; take replication logic for sampling; having peer-review in all stages

Contextual events surrounding of cases/units of analysis
Description
Following the ultimate aim of this project, which is to design an exemplar implementation plan of RRI in industry to demonstrate how industry can work together effectively with other societal actors and integrate principles and methodologies of RRI into research and innovation processes, we argue ICT domain for health, demographic changes and wellbeing as protocol context.
Activities
Study on distinctions between phenomenon (implementation plan of RRI) and context (ICT

domain); Analyse contextual conditions in relation to the cases
Plan Duration
M1-M8
Which partners are involved? (-led in bold)
SDU

The rationale behind the selection of case(s), subjects, roles, and viewpoints
Description
The purpose of the case studies is to assess the relevance, quality and usefulness of the implementation plan. A willingness to engage with / implement the plan is thus a key condition for selection of cases / units of analysis. Therefore, the following set of operational criteria for screening rounds is proposed to VTT and TECNALIA by SDU for case selection initiatives. This part is deemed as second and third stages of screening procedure for firstly selecting final real cases and a pilot case to serve and secondly assigning appropriate projects inside of each case as units of analysis to study. In fact, while VTT and TECNALIA will apply 'company level' criteria to choose right final cases, simultaneously they also look up at 'project level' and 'product level' criteria among plausible projects inside of cases to select one final project from each case will serve as unit of analysis. Set of operational criteria: Company level: • Size of company (SMEs, MNCs): • Company business strategy (B2B, B2C) • Company ownership/ legal form (Stock-market, privately owned) • Company age • Source of funding of company (from purely public funded to purely industry funded) • Company RRI awareness level • ICT category (Assistive technologies, technologies for physical prevention, and technologies for rehabilitation Project level: • R&I project type (Hardware-oriented, software-oriented) • R&I project age • Source of funding of project (from purely public funded to purely company funded) • Project RRI awareness level Product level • Product age • R&I product stage - Technology readiness levels (TRLs): we are seeking to assess the value of implementation plan; to do so, the same value chain levels addressed in Delphi study is applied. Therefore, to address the potential

societal risks and ethical issues within cases the following value chain levels is monitored:

- ✓ Early planning stage/Agenda setting
- ✓ Basic technology research
- ✓ Proof of concept
- ✓ Prototype demonstration
- ✓ Product development, engineering and testing
- ✓ Go to market

In fact following the Delphi study, principles of RRI will be determined. Although an authentic implementation plan still needs to have good practice cases for further investigations and assessment of the implementation plan. Given that it is important to give an indication of the type of project that could provide good practice cases and is therefore likely to be pursued. Technology readiness level (TRLs), in particular abovementioned stages of value chain are considered as project indications on which may assist us to integrate social and ethical aspects in research and innovation initiatives and could be traced at product level.

Activities
Set the operational criteria for second round of screening procedure by SDU; integrate Delphi study outputs into the operational criteria by SDU; second round of screening procedure among candidate cases by VTT and TECNALIA to choose final cases; approval of final cases by DMU
Plan Duration
M1-M12
Which partners are involved? (-led in bold)
VTT, TECNALIA, DMU and **SDU**

Definition of cases in terms of size, domain, process, and subjects
Description
Domain: Case selection is focused on companies that are developing a range of ageing ICT technologies using assistive technologies such as support and compensatory technologies for visual and hearing impairments, technologies for physical prevention such as technologies for memory disorders, and technologies for rehabilitation. Size of cases: Small and Medium-Sized Enterprises (SMEs) and Multinational Corporations (MNCs) These final real cases represent an ideal cross-thematic area to better understand and deepen existing approaches to RRI. The pervasive character and novel/peculiar characteristics of abovementioned technologies are profoundly challenging the relationship between science, innovation and society and therefore represent a true test case for RRI, both in the short and in the medium/long term.

Activities
Discussion with VTT and TECNALIA over availability of cases to investigate on by SDU; integrate preliminary Delphi study outputs from WP2 into case study design by SDU and DMU;
Plan Duration
M1-M12
Which partners are involved? (-led in bold)
VTT, TECNALIA, DMU, and **SDU**

Case study tactics for the quality of research designs
Description
We monitor all four quality common tests to judge the quality of research design: • Construct validity: ✓ WP3 involved partners use multiple sources of evidence during data collection (data triangulation). (For more information please refer to data collection section). ✓ Maintaining a chain of evidence in data collection contributes our case study to increase both construct validity and reliability. Given that the reader may follow the obtaining of any evidence from initial research steps to ultimate case study conclusions. ✓ Other consortium partners play key informants role to review case study draft/report. • Internal validity: ✓ SDU in collaboration with VTT and TECNALIA follow pattern matching and explanation building, and a logic model during data analysis. ✓ WP3 partners address rival explanations during data analysis as if it influences on interview questions. • External validity: ✓ Take replication logic for sampling in multiple-case studies we have • Reliability: ✓ SDU develop a case study database within data collection methods to collect all data for further investigation
Activities
Apply multiple source of evidence on data collection by VTT and TECNALIA
Plan Duration
M1-M35
Which partners are involved? (-led in bold)
All partners

Ethical Case Study
Description
The ethical guidelines cover key ethical factors include: • Informed participation (consent) • Integrity, quality and transparency of research • Confidentiality and anonymity • Research participants will take part voluntarily, free from any coercion • Handling of sensitive results related to the information of the company and information of the case study participants • Inducements • The independence of research, any conflicts of interest or partiality must be explicit • Feedback Consent forms with participant information form are handled among studied organizations earlier than any further investigations by VTT and TECNALIA.
Activities
Preparation of consent forms by TECNALIA; protection of collection data is done by SDU
Plan Duration
M1-M35
Which partners are involved? (-led in bold)
VTT, TECNALIA, **DMU** and SDU

3. Specific Action Plan of Case Study Design for Partners Involved in WP3 (reflected in Gantt Chart)

Case Study Design (M1-M15)

Start	Deadline	Activity	Who
Feb 2014	Sep 2014	*Case study research literature review*	SDU
June 2014	Oct 2014	*Identification of interview questions for WP3*	SDU, DMU
Oct 2014	Nov 2014	*Preparation of Interview questionnaire*	SDU
Oct 2014	Nov 2014	*Interview questionnaire draft*	SDU
Sep 2014	Nov 2014	*Preparation of letter of introduction for cases*	TECNALIA
Sep 2014	Sep 2014	*Discussion over case selection criteria draft during consortium meeting in Cyprus*	SDU
Sep 2014	Nov 2014	*Finalize a set of operational criteria by peer-review*	All partners
Oct 2014	Jan 2015	*Screening procedure upon candidate cases by agreed criteria*	All partners
Oct 2014	Jan 2015	*Select 4 real cases, 1 pilot case, and 2 alternative cases among 11 suggested cases by VTT and TECNALIA*	All partners
Jan 2015	Feb 2015	Distribute consent form among cases to participate at case studies	VTT & TECNALIA
Oct 2014	Dec 2014	Prepare primary interview questionnaire for pilot case	SDU

Jan 2015	Mar 2015	Verify applied method by pilot case	SDU
Dec 2014	Mar 2015	Integrate preliminary Delphi study outputs (1st and 2nd round) into case study design	SDU, DMU
Mar 2015	Apr 2015	Develop relevant lines of interview questions by pilot case outcomes	SDU, all partners
Jan 2015	Mar 2015	Judge the quality of the research design by peer-review	All partners
Jan 2015	Mar 2015	Finalize list of cases	SDU
Jan 2015	Mar 2015	Finalize case study design	SDU

Table 2: Action plan for case study design

4. Data Collection

Different data sources will apply in doing our case studies in order to mitigate the risks of one interpretation of one single data source. In essence, our case study protocol takes into account different viewpoints and roles with regards to project path and uses as many sources as possible. Such multiple sources of evidence in our case study data collection allow our investigations to address broader range of relevant issues, converges data in a triangulating fashion, and develops lines of inquiries. We are seeking, therefore, to use an impressive array of sources of evidence and extend our observations, with semi-structured interviews, archival records, and midstream modulation method.

In first scenario, VTT and TECNALIA conduct fully transcribed semi-structured interviews with project leaders in two rounds (M14-M16 and M26-M28), apply two rounds of collecting project documentation and archival records (product flyers/financial reports/archival records) (M14-M19 and M25-M27), and circulate electronic questionnaire among 10 researchers of monitored projects during two periods (M17-M19 and M25-M27).

In an alternative scenario, SDU suggest performing “Midstream Modulation (MM)” as qualitative method and “WIAT+” as quantitative method to integrate RRI implementation plan in their research practices of projects. Both methods plan in 12 subsequent weeks by VTT and TECNALIA to study on 4 assigned project leaders from each selected project (2 assigned project leaders play MM group and 2 remained participants served as comparison group (C-group)). A group of project leaders is assigned to WP3 by VTT and TECNALIA to participate in this study. All four project leaders have a background in the field of ageing, work on the same project but studied different technological aspects of the project.

One of common sources in both scenarios is the semi-structured interview. Interview as a direct method allows our investigators being in direct contact with the subject, assess the RRI implementation plan through interview questions that gained from WP1 and WP2 outcomes, and collect data in real time. VTT and TECNALIA are conducting semi-structured interviews with either project leaders or researchers in projects that assist us to optimize our exploration over studied subjects. Questionnaire is conducted by SDU in a separate

document rather this report. Interview questions are not necessarily asked in the same order as they are listed.

Moreover, we notify interviewees with regards to project ethical approval and ensure them that gained information from interviews, sensitive scientific and technological details of projects will only be used for the Responsible-Industry project and will not be used for any other purpose. Findings from the interviews will be incorporated into project reports and may also be included in publications and presentations about the project and RRI.

Item	Case Study Protocol Data Collection Checklist Items	Lead partner (leader in bold)	Target month
1	Data collection timeframe is set	SDU	M15
2	Data triangulation, method triangulation and investigator triangulation is scheduled	VTT, TECNALIA, and SDU	M35
3	Measurement tools is set fully e.g. interviews questions	SDU	M28
4	Desirable methods and measurements sufficient to fulfil the objective of study are defined	VTT, TECNALIA, and SDU	M28
5	Data collection methods are verified by peer-review	All partners	M15
6	Data collection design is approved by review board and pilot cases outcomes	All partners	M17
7	Informed consent forms for individuals and organizations are conducted	VTT and TECNALIA	M15
8	Authentic linkage of collected data to case study protocol	SDU	M35
9	Unequivocal addressing of collected data to the research question	SDU	M35
10	Observation methods are set e.g. observation during midstream modulation method	VTT and TECNALIA	M28
11	Suitable recorded data, fully transcribed, and where necessary translate it into English	VTT and TECNALIA	M28
12	Sensitive results for the project is evaluated	SDU	M28
13	Maintain the chain of evidence during protocol processes	VTT, TECNALIA, and SDU	M35

Table 3: Protocol data collection checklist

Data Collection Checklist

Data collection Timeframe
Description
SDU is in charge to announce a timeframe as a Gantt chart to VTT and TECNALIA for all

stages of collecting data
Activities
Providing a Gantt chart for data collection; Identification of data collection tools
Plan Duration
M1-M15
Which partners are involved? (-led in bold)
SDU

Triangulation
Description
VTT and TECNALIA are in charge to collect minutes, documents, charts, and other records from real cases to converge data in a triangulating fashion. As we have different evaluators including VTT and TECNALIA researchers, investigator triangulation is met. Multiple sources of evidence which VTT and TECNALIA will collect, allows us to develop data triangulation. Moreover, several different applied methods fulfil method triangulation.
Activities
Meet data triangulation; fulfill investigator triangulation; having method triangulation
Plan Duration
M15-M35
Which partners are involved? (-led in bold)
VTT, TECNALIA, and **SDU**

Interview Questionnaire
Description
Constructing the interview guideline - 4 steps 1. Collect questions 2. Scrutinize questions & reduce questions – eliminate questions asking for facts (or put them aside for checklist/drop off) – do the questions generate narrations (openness)? – put the questions in which describe ‘what do I already know?’ and ‘what would surprise me?’ 3. Sort remaining questions (2 packages) – with regard to timing of events and with regard to applied methods 4. Subsume questions (final structure) – primary questions (narration generating questions, covering a broad range) – mark secondary questions or transform them into key words – Sequencing, warming up-phase (thank you, anonymity, recording) & closing questions (“do you want to add s.th.?” Checklist)
Activities

Conduct a primary interview questionnaire for pilot case by SDU; develop relevant lines of interview questions by pilot case outcomes by SDU; conduct an interview guideline by SDU; verify lines of final interview questionnaire by consortium partners review.
Plan Duration
M9-M15
Which partners are involved? (-led in bold)
SDU is in charge in collaboration with all partners

The Pilot Case Study
Description
The pilot case report is valuable to our protocol since we apply the same determined source of evidence for pilot case to verify applied method; further, our pilot case report explicitly focus on lesson learned for both research design and data collection procedures. In essence, the report from our pilot case illustrates the modification to be attempted in the next real cases and assists to develop relevant lines of interview questions.
Activities
Assess the implementation plan through pilot case by SDU (use the first round of Delphi study results); report of pilot case by SDU to describe, explicitly, lesson learned for both research design and data collection methods; identification of primary codes for data analysis
Plan Duration
M14-M16
Which partners are involved? (-led in bold)
SDU

Data Collection Methods
Description
SDU proposes data collection method for WP3 in which societal and ethical concerns are addressed onto project leaders / researchers decisions to assess the relevance, quality and usefulness of the RRI implementation plan. To conduct such method we specify pragmatic used sources of evidence in doing case studies. Interviews are essential source of case study information (Yin, 2009). At interviews, although VTT and TECNALIA are pursuing a consistent interview guideline, resilient stream of questions in cases are likely to be asked (H. J. Rubin and Rubin 1995). In essence, VTT and TECNALIA will follow line of inquiry conducted by SDU while simultaneously asking their own actual questions in an unbiased manner by which these two operation levels contribute our case study protocol to become more valid and reliable. Moreover, to corroborate and augment outcomes, plus having collected data in a triangulating fashion, we also collect data from different hierarchical levels in leading

projects; firstly, VTT and TECNALIA will observe project leaders' perceptions regarding societal and ethical concerns on their projects before and after lodging the RRI implementation plan report to them–output of WP2. In essence, such interviews identify likely changes on top-down decisions of project leaders regarding societal and ethical aspects. The process starts with a pre-interview at initial weeks of study and end up with post-interview at final weeks. Interviews are performed by VTT and TECNALIA under semi-structured style using an interview guideline that is conducted by SDU. Our investigators (social science or humanities scholars from VTT and TECNALIA) would benchmark awareness of RRI principles amongst project leaders (interviewees) by comparing differences in their answers to the questions given in the pre- and post-interviews. Since getting interview with well-informed interviewees provide insightful inferences and explanations, VTT and TECNALIA are in charge to inform cases /units of analysis regarding to the logic of interviews earlier than conducting interviews. Secondly, to identify bottom-up project decisions changes regarding societal and ethical aspects, SDU suggest circulating an electronic questionnaire among ten researchers working in relevant projects in two rounds before and after lodging the RRI implementation plan report to them in order to see the RRI implementation plan impacts on research practices among not project leaders but also among people who engaged in actual research duties. To do so, A group of researchers is assigned to WP3 by VTT and TECNALIA to participate in this study. All ten researchers have a background in the field of ageing, work on the same project but studied different technological aspects of the project. The line of inquiries for such electronic questionnaire is shaped and developed by SDU through a variety of social, ethical, and RRI factors while simultaneously referring to the outputs of WP1 and WP2. Moreover, VTT and TECNALIA also apply two rounds of collecting project documentation and archival records (product flyers/financial reports/archival records).
Activities
Semi-structured interviews with project leaders by VTT and TECNALIA (M17-M19 and M26-M28); collecting project documentation and archival records by VTT and TECNALIA (M17-M22 and M28-M30); circulate electronic questionnaire among ten researchers of projects by VTT and TECNALIA (M17-M19 and M26-M28); fully transcription of semi-structured interviews by VTT and TECNALIA; Data collection method/tools verified by peer-review
Plan Duration
M14-M28
Which partners are involved? (-led in bold)
VTT, TECNALIA, and **SDU**
How will the activities be accomplished?
VTT and TECNALIA conduct fully transcribed semi-structured interviews with a project leader of each project in two rounds (M17-M19 and M26-M28), and where necessary translate it into English VTT and TECNALIA apply two rounds of collecting project documentation and archival records (product flyers/financial reports/archival records) (M17-M22 and M28-M30)

VTT and TECNALIA circulate electronic questionnaire among ten researchers of monitored projects during two periods (M17-M19 and M26-M28). This electronic questionnaire design by SDU in SurveyMonkey format.

Case Study Database
Description
To compose the actual case study report, we need an authentic database with organized and documented the data collected for case studies. Developed database in our case studies include semi-structured interview transcripts, observations, tabular materials related to documentations, archival records, press articles, and other quantitative data. This archived database can serve as our inputs for the subsequent cross-case analysis. So, to collaborate in real time without the need to merge projects, analyze more data, more securely with larger project sizes and authenticated access, and deliver findings faster, VTT, TECNALIA, DMU and SDU use NVivo 10 with NVivo server for database. SDU in collaboration with DMU play a leader role for final coding decisions for NVivo.
Activities
Use NVivo in all data collection methods by VTT, TECNALIA, and SDU;
Plan Duration
M15-M35
Which partners are involved? (-led in bold)
VTT, TECNALIA, DMU and **SDU**

5. Data Analysis

Qualitative data analysis methods are applied for our case studies as they are commonly used for case study research (Seaman 1999; Runeson et al. 2009). Such analysis contains examining, categorizing, tabulating, and testing to draw empirically based conclusion (Yin, 2009). The basic aim of the project analysis, which is obtaining conclusions from the data, induced by keeping a clear chain of evidence. SDU carry out case analysis in parallel with the data collection processes that proceed by VTT and TECNALIA. In addition, since our case study follows a feedback loop, new insights during the analysis may require us to redesign the original research design. To investigate such new insights and discoveries, VTT, TECNALIA, and SDU update interview questionnaires to gain new data in controversial cases. To reduce biases of analyzing, at initial steps of data analysis peer-reviews by all consortium partners assist us to optimize the authenticity of the process. In fact, the preliminary results from data collection are transferred into a common analysis process and invariably SDU keep tracking and do report at analysis stage to increase the validity of the study.

We apply NVivo as computer-assisted qualitative data analysis software. The tool assists us to code and categorize large amount of collected data as narrative text that conducted by semi-structured interviews, MM, and electronic questionnaire. NVivo also codes and categorizes large volumes of written materials, such as archival records, press articles, etc. NVivo is compatible with SurveyMonkey as data collection tool. Therefore, we use those for both collecting data and data analysis.

The analysis of qualitative data is conducted in a series of steps (Miles and Huberman, 1994). First data is coded, which means SDU put information into different arrays in order to code the text according to certain theme, area, construct, etc. we also add investigators' comments into the coded data (with codes or sub-codes), such as memos. As its result, we make a matrix of categories and locate the evidence within those categories. To examine the data, we create data displays, includes flowcharts and other graphics. Such flowcharts help us to identify a first set of hypotheses. Primary hypotheses could be frequent phrases in different parts of material. These identified hypotheses, which use in parallel with data collection under an iterative process, would be optimized regularly; in turn a small set of generalization can be formulated. These series of steps are executed iteratively to meet the ultimate goal.
Our analysis will show that we utilize all the collected sources of evidence. SDU develop rival hypotheses, cover key research questions, and use as much evidence as available. Likewise, our interpretations would account for all the sources of evidence and our analysis sought to address as many rival interpretations as possible. We address irresponsible research and innovation along the value chain of ICT for health, demographic change and wellbeing and seek to integrate studies on technology readiness levels for both responsible and irresponsible innovation into our analysis and interpretations.
Finally, most significant aspect of case studies would address to reflect our expertise in carrying out the analysis. In a nutshell, we have the careful and detailed analysis work in this section, which is done technically by SDU.

Item	Case Study Protocol Data Analysis Checklist Items	Lead partner (leader in bold)	Target month
1	Analytic strategy, clear roles and review procedures are defined	SDU	M17
2	Follow a traceable interfaces between data and research question	SDU	M35
3	Alternative perspectives and explanations in case analysis is addressed	SDU	M30
4	Pattern matching and rival explanations are set	VTT, TECNALIA, and SDU	M30
5	Analysis outcomes is verified by consortium partners	All partners	M34
6	Clear conclusion from analysis, recommendation for practice and future research are set	SDU and DMU	M35
7	Follow a high-quality analysis is monitored over time	SDU	M35

Table 4: Protocol data analysis checklist

Data Analysis Checklist

Analytic strategy & Clear Roles
Description
SDU carries out case analysis in parallel with the data collection processes that proceed by VTT and TECNALIA. To do so, SDU conducting case study analysis relying on theoretical propositions come from implementation plan (WP1 and WP2 outcomes), case descriptions, collected data including qualitative and quantitative data, and rival explanations (implementation rivals). NVivo 10 is used for case analysis reason by SDU.
Activities
Address alternative perspectives and explanations in case analysis by SDU; address rival explanations (implementation rival) into data collection process according to primary collected data analysis by SDU; verify analysis by peer review (consortium partners)
Plan Duration
M20-M33
Which partners are involved? (-led in bold)
VTT, TECNALIA, DMU, and **SDU**

6. Specific Action Plan of Data Collection and Data Analysis for Partners Involved in WP3 (reflected in Gantt Chart)

Data Collection and Analysis (M15-M35)

Start	Deadline	Activity	Who
Sep 2014	Jan 2015	*Identification of data collection tools*	SDU
Sep 2014	Apr 2015	*Data collection method/tools verified by peer-review*	SDU
Nov 2014	May 2015	*Identification of primary codes for data analysis (priori codes)*	SDU
June 2015	Aug 2015	*1st round of semi-structured interviews with project leaders*	VTT and TECNALIA
July 2015	Oct 2015	*Transcription of 1st round interviews with project leaders*	VTT and TECNALIA
Sep 2015	Jan 2016	*Analysis of 1st round interviews with project leaders*	SDU
June 2015	Nov 2015	*1st round of project documentation and archival records (Product flyers/Financial reports/Archival records)*	VTT and TECNALIA
Nov 2015	Mar 2016	*Analysis of 1st round of archival data*	SDU
June 2015	Aug 2015	*1st round of circulating electronic questionnaire among 10 researchers of projects*	VTT and TECNALIA
Sep 2015	Jan 2016	*Analysis of 1st round of electronic questionnaire*	SDU

Mar 2016	May 2016	*2nd round of semi-structured interviews with project leaders*	VTT and TECNALIA
Apr 2016	July 2016	*Transcription of 2nd round interviews with project leaders*	VTT and TECNALIA
June 2016	Oct 2016	*Analysis of 2nd round interviews with project leaders*	SDU
May 2016	July 2016	*2nd round of project documentation and archival records (Product flyers/Financial reports/Archival records)*	VTT and TECNALIA
July 2016	Oct 2016	*Analysis of 2nd round of archival data*	SDU
Mar 2016	May 2016	*2nd round of circulating electronic questionnaire among 10 researchers of projects*	VTT and TECNALIA
June 2016	Oct 2016	*Analysis of 2nd round of electronic questionnaire*	SDU
Aug 2016	Nov 2016	*Document all data in a specific report*	SDU and DMU

Table 5: Action plan for data collection and data analysis

7. Case Study Reporting

The following items show our efforts to document development of protocol:

Item	Case Study Protocol Reporting Checklist Items	Lead partner (leader in bold)	Target month
1	Case study & its units of analysis is presented	SDU	M17
2	Objectives, interview questions, and corresponding answers are reported	SDU	M17
3	Relations between RRI implementation plan and research question are reported	SDU	M17
4	Protocol developments over time in NVivo server is documented	SDU	M35
5	Data collection procedures is presented	VTT, TECNALIA, and SDU	M30
6	Analysis procedures clearly are reported	SDU	M35
7	Protocol quality and validity of analysis over time is evaluated	SDU	M35
8	Ethical issues are reported	DMU and SDU	M35
9	Conclusion, implication for practice and future research are set	VTT, DMU, and SDU	M42

Table 6: Protocol reporting checklist

8. Specific Action Plan of Case Study Reporting for Partners Involved in WP3 (reflected in Gantt Chart)

Case Study Reporting (M1-M35)

Start	Deadline	Activity	Who
Feb 2014	Dec 2014	*Case study protocol report*	SDU-led
Sep 2014	Feb 2014	*Letter of introduction & consent form*	SDU-led

Oct 2014	Apr 2015	*Interview questionnaire*	SDU-led
Jul 2014	Nov 2014	*Case selection criteria report*	SDU-led
Oct 2014	Mar 2015	*List of final cases and pilot case*	SDU-led
Sep 2014	Apr 2015	*Data collection tools report*	SDU-led
June 2015	Oct 2016	*Semi-structure interviews with project leaders reports*	SDU-led
June 2015	Oct 2016	*Electronic questionnaire result report*	SDU-led
June 2015	Oct 2016	*MM & WIAT+ outputs reports*	SDU-led
Aug 2016	Nov 2016	*Document all data in a specific report*	SDU-led

Table 7: Action plan for case study reports

9. References

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Appendix 1: Summarized Case Study Protocol Checklist in one view

Item	Case Study Protocol Checklist Items	Lead partner (leader in bold)	Target month
1	Clear objectives, preliminary research question and hypotheses (if any defined) are set	SDU	M8
2	What are case(s) and its units of analysis? The unit(s) of analysis, including holistic and embedded unit(s) of analysis are defined	VTT, TECNALIA, DMU and **SDU**	M12
3	Contextual events surrounding of these units are defined	SDU	M8

4	Theoretical basis of cases based on existing literature are defined	SDU	M8
5	Invitation letter for participants/candidate cases is conducted	TECNALIA	M11
6	The rationale behind the selection of case(s), subjects, roles, viewpoints, etc. are set	VTT, TECNALIA, DMU and **SDU**	M10
7	Cases are adequately defined in terms of [size, domain, process, subjects, etc.]	VTT, TECNALIA, DMU and SDU	M12
8	If we have any cause-effect relation to the study, we identify cause-effects and distinguish from other factors	SDU	M12
9	Case study design will be embedded by multiple data sources (triangulation) & using multiple methods (method triangulation)	VTT, TECNALIA, and SDU	M12
10	Case study tactics for the quality of research designs are addressed	SDU	M12
11	Integrity of individuals/organization, quality and transparency are noted	SDU	M12
12	Data collection timeframe is set	SDU	M15
13	Data triangulation, method triangulation and investigator triangulation is scheduled	VTT, TECNALIA, and SDU	M35
14	Measurement tools is set fully e.g. interviews questions	SDU	M28
15	Desirable methods and measurements sufficient to fulfil the objective of study are defined	VTT, TECNALIA, and SDU	M28
16	Data collection methods are verified by peer-review	All partners	M15
17	Data collection design is approved by review board and pilot cases outcomes	All partners	M17
18	Informed consent forms for individuals and organizations are conducted	VTT and TECNALIA	M15
19	Authentic linkage of collected data to case study protocol	SDU	M35
20	Unequivocal addressing of collected data to the research question	SDU	M35
21	Observation methods are set e.g. observation during midstream modulation method	VTT and TECNALIA	M28
22	Suitable recorded data, fully transcribed, and where necessary translate it into English	VTT and TECNALIA	M28
23	Sensitive results for the project is evaluated	SDU	M28
24	Maintain the chain of evidence during protocol processes	VTT, TECNALIA, and SDU	M35
25	Analytic strategy, clear roles and review procedures are defined	SDU	M17
26	Follow a traceable interfaces between data and research question	SDU	M35
27	Alternative perspectives and explanations in case analysis is addressed	SDU	M30
28	Pattern matching and rival explanations are set	VTT, TECNALIA, and SDU	M30
29	Analysis outcomes is verified by consortium partners	All partners	M34
30	Clear conclusion from analysis, recommendation for practice and future research are set	SDU and DMU	M35
31	Follow a high-quality analysis is monitored over time	SDU	M35

32	Case study & its units of analysis is presented	SDU	M17
33	Objectives, interview questions, and corresponding answers are reported	SDU	M17
34	Relations between RRI implementation plan and research question are reported	SDU	M17
35	Protocol developments over time in NVivo server is documented	SDU	M35
36	Data collection procedures is presented	VTT, TECNALIA, and SDU	M30
37	Analysis procedures clearly are reported	SDU	M35
38	Protocol quality and validity of analysis over time is evaluated	SDU	M35
39	Ethical issues are reported	DMU and SDU	M35
40	Conclusion, implication for practice and future research are set	VTT, DMU, and SDU	M42

Table 8: Case study protocol checklist