Governance for Responsible Innovation

GREAT – 321480

SEVENTH FRAMEWORK PROGRAMME

Requirements for Guidelines			
Deliverable No.		**D 6.1**	
Work package No.	**WP 6**	Work Package Title	**Guidelines and recommendations**
Task No.	**6.1**	Task Title	**Definition of requirements for guidelines**
Start Date:	**M 10**	Revision Date:	**M 21**
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Status (F: final; D: draft; RD: revised draft)		**F**	
Distribution		**PU**	
Document ID / File Name		**D 6.1 Requirements for guidelines**	

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1. Executive Summary

GREAT's WP 6 focuses on the development of guidelines for conducting research and innovation processes in a responsible way (Responsible Research and Innovation, or RRI). This deliverable defines and discusses the *requirements* for the guidelines (Task 6.1). Developing a clearly defined set of requirements helps to ensure that practical relevance is injected across the GREAT project early in the research phase. This set of requirements will serve as an input to the work conducted in earlier WPs, as well as ensure that the resulting guidelines will be both useful and relevant. It should be emphasised from the outset that this document D6.1 does not indicate the content of the guidelines as its purpose is to provide a framework on which the guidelines can be built. This document is a suggestion for a basic framework. A thematic analysis of the first workshop responses enabled development and revision of the initial requirements from which the final requirements were derived. The content of the guidelines will be decided by the application of the GREAT project findings, through further stakeholder participation in two further workshops (M24, M25 and M30) and with consortium partner involvement as Task 6.2 progresses. Subsequent workshops in M24 and M25 will review and revise the guidelines themselves.

The final set of guidelines (D 6.2, Guidelines Handbook) will take into account the key findings of all other GREAT work packages. These include, for instance, the concept of reflexivity, the focus on the relation between norms and context, and a concept of inclusion leading to co-construction (WP 2). The purpose of the guidelines is to support different stakeholders' own initiatives in identifying and implementing related RRI measures and practices. The requirements therefore, should ensure that the approaches, format and content used within and to create the guidelines, are informed by the findings from the GREAT project and the results of the stakeholder engagement process.

The guidelines need to be relatively flexible given that there are a variety of ways of conducting research and innovation in many different contexts. The underlying core requirement therefore, is in line with one of the main findings of WP 2 regarding the construction of norms (of responsible behaviour) for a given context, and will be taken into account where possible throughout the whole of WP6. Other GREAT work packages have started to build on this general insight by analysing reflexive governance, the reflexive construction of social actors and the learning capacities of social actors and institutions through 12 case studies (D 3.2, Exemplifying the Typology with Relevant RRI Projects; D 4.2, Case Study Report). The findings of this work will be incorporated into the construction of the final guidelines in Task 6.2.

There are a growing variety of RRI projects and initiatives apart from GREAT that are working to conceptualise and better refine understanding of the RRI landscape. The guidelines developed by GREAT will draw on these additional sources, thus broadening the knowledge base on RRI, without compromising on GREAT's own research results.

Against this backdrop, an initial set of requirements for the guidelines was constructed by building on findings from GREAT work packages other than WP 6, and taking into account existing practice from related European projects such as CONSIDER (section 5.1). Furthermore, for each requirement, the need for flexibility and adaptability between general and specific requirements is highlighted in the table (p. 15-17) as well as possible issues and concerns that may become important when the guidelines are actually composed in Task 6.2 (section 5.2).

The initial set of requirements was reviewed by GREAT partners (internal review process), and also by relevant stakeholders in a workshop (section 6). Both kinds of feedback were then used to craft the set of 11 requirements below (section 7). Some of these may change or be refined further during the ongoing internal deliberation processes, that is, between M 20 and M 36 of the GREAT project when the guidelines will actually be developed (Task 6.2) and reviewed (Task 6.3).

Constructive, process focused requirements

1. Use a common language that overlaps all disciplines.
2. Be concise and ensure that the guidelines are practical and usable (bullet points etc.) as shorter documents are more likely to be read and understood.
3. Use good style to enhance readability (colours, diagrams, pictures, other types of media). Make the guidelines attractive and easy to understand.
4. Provide an interactive document, e.g. links to RRI websites, case studies, providing examples of 'good'/'bad' practice or normative dilemmas, tools and resources, placing particular emphasis on the findings from GREAT project research. The goal is to provide examples for discussion leading to organisational/individual learning.
5. Provide a cover page with the key points to give a starting point for users of the guidelines

Substantive, content focused requirements

6. Provide a small number of concise RRI definitions and other key terms that are tightly coupled to the findings from GREAT. Also, provide a description of meaning, scope, and complexity within the document through links to the Glossary (D2.1).
7. Provide links to further definitions of RRI including those both perceived by the GREAT project and within the wider discourse to broaden awareness of RRI principles and to encourage the use of RRI theory to relate to user's own practice.
8. Provide methods to re-asses and challenge the guidelines including a regular review (this means that a key principle of RRI in GREAT's own guidelines should be considered: reflexivity).
9. Respond to existing frameworks, e.g. existing selection, funding and evaluation criteria for research projects) and relate the benefits and problems of RRI to such frameworks.
10. If the pluralistic approach to RRI currently developed in GREAT goes beyond the scope of requirement 6 ('provide only a small number of concise RRI definitions'), deliberate on possible ways of representing this pluralistic approach without compromising too much on requirement 2 as there will always be trade-offs in requirements. This will be made according to their specific context and will consider the extent to which such a stakeholder-oriented and context-sensitive approach is feasible within the timescale of GREAT.
11. If explicit norms of responsible behaviour are expressed in the guidelines, these norms should be established with the participation of stakeholders. (This requirement rests on one of the key findings of GREAT: 'good' governance implies, among other things, that various actors participate in the making of the very norms they subsequently have to follow).

2. Introduction

The GREAT project is tasked with developing an empirically based and theoretically sound model of the role of responsible research and innovation governance. An important related aim is to translate the project's research findings, as formulated and synthesized in Work Packages (WPs) 2 to 5, into manageable and applicable recommendations and guidelines that support different stakeholders in their approach to responsible research and innovation. WP 6 of the GREAT project focuses on this development of guidelines and recommendations.

The first task (6.1) of WP 6 concerns itself with the definition of *requirements* for guidelines. Developing a clearly defined set of requirements helps to ensure that practical relevance is injected across the GREAT project early in the research phase. This set of requirements will serve as an input to the work conducted in earlier WPs, as well as ensure that the resulting guidelines will be both useful and relevant.

This deliverable (D 6.1) documents the process of constructing and testing the set of requirements. Describing this process provides insight into the reasoning behind the structure and contents of the requirements.

First, the purpose of the (requirements of the) guidelines is discussed (section 3), followed by an explanation of the rationale and methodology used for constructing the guidelines (section 4). In accordance to the proposed methodology, section 5 discusses the construction of an initial set of requirements alongside establishing to what extent flexibility and adaptability are needed between general and specific requirements. Also, it highlights possible issues and concerns that may become important when the guidelines are actually composed in Task 6.2. In section 6, feedback from the stakeholder workshop and GREAT consortium partners (internal review process of GREAT), and the subsequent revisions to the initial set of requirements is indicated. Based on this double review process the final set of requirements is presented in section 7.

3. Purpose of the (Requirements for the) Guidelines

Based on the findings of research conducted in the GREAT project, guidelines will be developed for stakeholder groups involved in research and innovation processes. The stakeholder groups include, but are not limited to, researchers, research organisations, Civil Society Organisations (CSOs), research funders, and policymakers in research and innovation. The guidelines should allow each stakeholder group to develop suitable strategies of responsible innovation during all phases of the project life cycle, from planning and implementation to evaluation and revision. WP 6 attempts to achieve this goal as far as possible, given the limited timescales of GREAT.

Thus, in WP 6 the goal is to develop guidelines for the use of RRI in practice, across a broad spectrum of needs and concerns. The guidelines will be aimed at researchers and innovators looking to embed RRI principles, such as the five pillars of RRI identified in WP 2 (D 2.2, Theoretical Landscape, pp. 71-76): anticipation, transparency, responsiveness, reflexivity and participation, within their operations. This may be particularly relevant to those seeking funding from national (public) funding institutions such as the European Commission and other bodies that are starting to require RRI to be at the core of research proposals.

The guidelines must not re-invent the wheel by operating in isolation from other approaches and projects in the RRI context. To prepare the road, GREAT's own D 6.4.1, Annual Report on the Main Trends of SiS, has presented an analysis of eight RRI accounts forwarded in current discourse. In addition, D 2.2, Theoretical Landscape, has problematized current valuations of core concepts of RRI such as responsibility and reflexivity. This analysis has surfaced some fundamental conceptual gaps that need addressing in the guidelines, most notably the following: many existing theoretical accounts of RRI rely on norms that are disconnected from individuals' normative horizons (cf. D 2.2, p.77), or on norms that are presupposed as being given from the outside (D 2.2, p.69). To fill this conceptual gap, a governance approach has been suggested that allows for the collective construction of norms in relation to their context (see, for instance, D 2.2, p.71 & p.96). In D 2.3, Analytical Grid Report (section 5, pp. 79-82), this governance approach ('Co-construction') has been compared to three other governance approaches ('Standard', 'Revised Standard' and 'Consultation'). These four approaches have then been explored further and applied to 12 empirical cases analysed in WP 3 and WP 4 (D 3.2, 'Exemplifying the Typology with Relevant RRI Projects', D 4.2, Case Study Report).

Furthermore, it is sensible to draw on the findings of other projects to inform guideline development within GREAT. For example, the RRI tools project has started to develop resources to advocate, train, disseminate and implement RRI under the European Commission's Horizon 2020; the CONSIDER project has created a set of guidelines and recommendations that should enable civil society organizations to become involved in research and innovation projects; and the FRRIICT project devised a set of tools to embed RRI within ICT research. [1] The experiences of these projects have highlighted the complexity emerging within the field of RRI and the diverse nature of stakeholder needs across and within projects, areas of enquiry, disciplines and sectors.

Thus, both GREAT's own findings and the experiences from other projects suggest that the guidelines should be context-specific, supporting the building of norms in relation with their context; they should be comprehensive and broad enough to have relevance across all sectors; and they should also be flexible enough so that they can be adapted further to fit specific needs.

Therefore, we draw the following conclusion which impacts both the guidelines themselves, and the requirements for these guidelines explained in this document:

Given the variety of understandable and legitimate ways of conducting research and innovation in different contexts, the guidelines need to be designed in a way that they *support* different stakeholders' own initiatives in identifying and implementing relevant RRI measures relative to their specific context. Moreover, the guidelines should aim at favouring and implementing core dimensions of RRI such as responsibility, anticipation, reflexivity, inclusion, transparency and collective learning as have been outlined in various previous GREAT deliverables such as, D 2.2, D 2.3, D 3.2 and D 4.2. The purpose of the guidelines therefore is to provide a small number of relevant *resources* for RRI in practice, whilst being concise and usable.

According to the GREAT's project DOW, Task 6.2, it is "envisaged that *distinct* versions of the guidelines will be developed for *specific* stakeholder groups" [emphasis added]. In order to address this project requirement the guidelines will be tailored by stakeholders for use in their specific domains. Previous work in the development of guidelines has been examined. The evaluation of the

[1] http://www.rri-tools.eu/; http://www.consider-project.eu/; http://responsible-innovation.org.uk/torrii/; 10-09-2014; see also further projects focusing on RRI such as, RESPONSIBILITY and PROGRESS; http://responsibility-rri.eu/; http://www.progressproject.eu/; 10-09-2014

CONSIDER project's guidelines revealed an approach that focused on researchers, Civil Society Organisation representatives, policymakers and funders and this will be used to inform the GREAT project approach to the development of the guidelines. The resulting guidelines will also be informed by the other GREAT work packages, as these also include stakeholder-specific findings. The findings of the workshops and consortium participation will enable solidly based decisions to be made so that the guidelines may be as appropriate as possible for each stakeholder group, and to identify which and in what way these groups should be addressed directly.

4. Rationale and Methodology

The GREAT project, as part of the EU FP7 Science in Society focus aims to 'affect policy and further European goals' (DOW, Work plan table for WP 6, p. 20). Therefore the research findings of the WPs 2 to 5 need to be translated into manageable and applicable recommendations and guidelines that allow stakeholders to improve their approach to responsible research and innovation. This deliverable (D6.1) is the first step towards this goal and aims to provide the requirements for the guidelines to inform their development in T6.2.

To inform the developments of the requirements for the guidelines, firstly, a document analysis of GREAT deliverables was undertaken to strengthen our understanding of the landscape of the governance of RRI in which the GREAT project and resulting guidelines will sit. Secondly, documents from other projects such as CONSIDER were analysed to provide insight into previous work on the development of guidelines which also focus on an RRI approach. Thirdly, a thematic analysis of the workshop discussion enabled the initial requirements to be considered from the perspectives of stakeholders, and which resulted in the development of the final set of requirements. These requirements are therefore the starting point for the development of the guidelines themselves.

It is understood that for guidelines to become normalised in practice by the user, they must be developed in context. The identification of the requirements of the guidelines therefore, should be informed by the context from which the requirements are reviewed and revised. WP2 in examining the work of Maesschalck and Lenoble (2011), who 'developed a rich reflection about the relation between norms and their context' (D2.2 p.80), explains that norms lack practical relevance when they are not constructed in relation with their context. Therefore, it is considered to be important when formulating a set of requirements to understand the norms, expectations and context of the stakeholder groups towards the creation of guidelines for RRI in practice. Accordingly, the process of constructing the guidelines and to solicit stakeholder feedback on them will ensure that contextual considerations are also taken into account in the GREAT project.

WP 3 and WP 4, through a survey, a case study analysis, workshops, semi-structured interviews and focus groups is aiming to discover perspectives and understanding of the core principles of RRI amongst EU researchers who are likely to be directly affected by any guidelines aimed at incorporating RRI principles into their working practices. This work will inform WP6 to provide insight into established norms within the researcher community and to understand perceptions of governance within their context.

Governance has been identified in Task 2.2, D2.2, Theoretical Landscape, as 'an attempt to answer a "trilemma" between "scientific accuracy, policy effectiveness and political legitimacy" (Pellizzoni, 2004), i.e. between the rules of scientific knowledge, the efficiency of political norms and rules, and their social acceptability (D 2.2 p.80). Further, governance is seen as reflexive and self-determining and considers the needs and inter-relationships between the affected actors. This concept, when considered in light of the development of guidelines, requires that decisions are not so much imposed from above, but emerge from a more democratic and inclusive process (for example D3.3, RI Corpus of Guidance and Governance and Taxonomy of Approaches, p.32). Ideally, this process acknowledges 'the active role of actors in the making of the norms and rules they will have to follow' (D 2.2, p. 80). Deliverable 3.3 explains how democratic approaches to participation (focus groups, workshops, questionnaires and so on) can facilitate acceptance (albeit with limitations). The consultation model and especially the co-construction model which are discussed in depth in both deliverables (D 2.2 and D 3.3) are considered to be of particular value in facilitating acceptance. These findings of the GREAT's WP 2 inform the construction of the requirements (D6.1) and the resulting set of guidelines (D6.2).

When identifying the requirements of the guidelines, the approach was also informed by particular considerations that are closely related to GREAT's WP 2. Felt and Fochler 2010 explain that it is important to avoid public engagement for its own sake, and to avoid the 'de-mocratising of democracy' (Felt and Fochler 2010 p.18). Therefore, efforts were made within the workshop and during the subsequent analysis to ensure participant input was directly fed into the requirements and their individual views considered of equal weight.

The participatory approach (Rowe and Frewer 2000) and concepts of procedural justice, which provide a theoretical perspective on the practical experiences of science policy (Joss and Browlea 1999) indicate the importance of democratic ideals surrounding science and technology policy. However engagement is just one of the conditions for RRI identified by the GREAT project and the requirements for the guidelines therefore, are also built on an understanding that successful RRI, and in particular any guidelines aiming at facilitating this goal, also needs to include the other core conditions of anticipation, transparency, responsiveness and reflexivity. It is anticipated therefore that this multidimensional and pluralistic approach of GREAT alongside the evaluation of the requirements at a workshop, will strengthen the validity of the RRI guidelines being produced in Task 6.2. Therefore, as a result of consideration of the principles discussed in the deliverables indicated above, throughout their development the resulting guidelines will be tested and reviewed, firstly in workshops in M24 and M25 as part of the development of the guidelines in Tasks 6.2 and Task 6.3 and again as part of the review process in M30, also as part of Task 6.3.

Through discourse between partners and the evaluation of other projects approaches to the development of guidelines, the initial requirements below (section 5) were developed. This first approach includes insights from our examination of the FP7 EU project, CONSIDER. This project was selected as its core task was to study how to engage with civil society organisations in research and promoting RRI involvement, and it has produced a set of guidelines as part of its remit. In addition, the expertise of consortium partners, alongside the examination of FRRIICT project tools also informed the development of the initial set of requirements. The process of development of the guidelines in CONSIDER in particular, including the scope and limitations were examined so that WP6 could be informed by previous experience which could be used towards the needs of the GREAT project. By developing and testing an initial draft of requirements at a workshop (described in section 6) with external stakeholders, i.e. different EU researchers and through a subsequently revised set of requirements, the approach and process utilised by the GREAT project significantly reinforces RRI both within the project itself and in the development of the guidelines in Task 6.2.

5. Requirements for the Guidelines (Initial Version)

The initial requirements presented below represent those that were discussed at the workshop and appear in Appendix lll. Subsequent revisions to the requirements are described in section 6 and shown in a table (p15-17).

5.1 Construction of the Initial Set of Requirements

This section is structured as follows: the initial requirements are presented and explained in a list from 1-14. The reasoning for inclusion of each set of requirements is contextualized and explained in a preceding paragraph. The guidelines should be seen as practical in application and informed by the research findings of the other GREAT work packages. It is important therefore that any guidelines that are developed are usable and relevant to those who would need to apply them.

It is understood that different stakeholders speak different languages (national; technical; domain-specific), and most of them have little time and are busy with various tasks. Moreover, nobody wants to be burdened with a supposedly new set of ‘regulations’ (which the GREAT guidelines are not, as responsibility is understood to be a moral concept and not a legal one, see D 2.2), and many people already need to read many documents on a daily basis. This consideration therefore led to the first set of requirements:

1. Guidelines should be written in a language that is as simple as possible. Sentences should be kept short. Where special terms are needed for clarity, a link should be provided to the appendix which should include a glossary of ‘foreign’ terms used in the guidelines. The glossary for the guidelines should be informed directly by the GREAT project glossary (D2.1) and the common glossary across four EU RRI projects (GREAT, RESPONSIBILITY, RES-AGORA and PROGRESS) which are currently being developed within the RESPONSIBILITY FP7 project.

2. The document presenting the guidelines should be as short as possible, i.e. 5-10 pages.

3. Colours, graphs, different fonts, images should be used appropriately to make the document readable and appealing although this should be done with caution to avoid overly garish or complex formatting. It is important to avoid confusion.

4. A digital interactive ‘document’ may be more effective and appealing to some stakeholders than paper guidelines and may provide the ability to link directly to the glossary and other resources. In this way decision-makers can better contextualize their RRI approach.

GREAT acknowledges that there are *a variety of definitions of RRI* that stakeholders should be aware of, and may use when developing their own RRI approach. This consideration leads to the next set of requirements for the guidelines:

5. Show a broad array of brief RRI definitions (i.e. definitions that are as heterogeneous as possible) without making the document too long and unwieldy. These definitions may help stakeholders to interpret RRI within their own specific context whilst enabling the broader implications of RRI to be considered. This should also identify the scope of RRI and the

importance of embedding its practices within research and innovation and avoid tick-boxes and bolted on practices which may be superficial and ineffective in bringing about change that reflects RRI principles.

6. For each RRI definition a brief paragraph should be provided to comment on the definition, provide a critique of its scope and to raise awareness of its limitations. This may discourage un-critical and literal application of definitions and should highlight the breadth and complexity of stakeholder approaches to RRI.

GREAT maintains that there is no universal, general way of achieving responsible research and innovation in practice because different stakeholders (individuals and organisations) and societal subsystems (e.g. academia vs. profit-oriented business) and different disciplines within academia often have a different understanding of 'what matters' in their respective area of work. More generally, different stakeholders have different perceptions of issues of concern. These are often embedded in disciplinary, societal and/or cultural considerations. Thus, these existing (perceptions of) different contexts are to be taken into account and surfaced when suggesting any RRI measures for a given project, area of enquiry, discipline etc. Moreover, any suggested measure such as, increasing the number of external stakeholders participating in a specific project activity, changes the context for all actors involved. In this way, 'context' and RRI activities are actually tightly intertwined, they depend on one another, make sense only in relation to one another, and may also evolve in relation to one another (cf. GREAT's D 3.2, Exemplifying the Typology with Relevant RRI Projects; 'Conclusion').

Thus, acknowledging the relevance of different contexts including generic and procedural conditions such as responsiveness or reflexivity in governance as discussed in depth in D 2.2, Theoretical Landscape, as well as the related dynamic change of both context and appropriate RRI measures, one of the basic tenets of GREAT therefore is to realise that RRI needs to provide sufficient room for *individual and organisational learning*. This defines the next set of requirements for the guidelines:

7. Include 2-3 brief case studies of 'bad practices' but highlight that these are very specific scenarios assuming very specific contexts. Therefore it is important to ensure that the presentation of such 'bad practices' serve to encourage different stakeholders to think about 'bad practices' within their *own* context. The presented 'bad practices' should open, not close further discussion.

8. Include 2-3 brief case studies of 'best practices', again highlighting their specific context, to provide examples for stakeholders' identification and development of 'best practices' within their *own* context and to further discussion.

9. Discuss examples of, and/or suggest the use of RRI and governance tools for individual/organisational learning (e.g. focus groups, ethical committees, advisory boards etc.).

10. Acknowledge that the suggested tools, activities and 'best practices' may not work for all kinds of stakeholders in all kinds of situations. Accordingly, readers should be encouraged to produce their own ideas for individual/organisational learning, based on their experiences in their work.

A great deal of the empirical work conducted in GREAT focuses on *EU funded researchers* and other related stakeholders (e.g. representatives of SMEs collaborating with academic researchers in EU project consortia). The guidelines therefore should reflect an awareness of existing organisational structures (which can be inflexible and, highly profit driven), local constraints, individual strategic aims and other legitimate needs or concerns of stakeholders. A specific funding framework and set of requirements for example, should significantly influence the extent to which any stakeholder may integrate RRI in their working practices, and the ways in which RRI may be realised. This leads to the next requirement:

11. Account for the EC's own Evaluation Framework at the programme level, e.g. the intervention logic model of four dimensions (relevance, effectiveness, efficiency, and utility). As far as possible relate the benefits and problems of each of the RRI tools, activities and 'best practices' discussed previously to relevant EC dimensions.

GREAT has conducted empirical work across WP 3 and WP 4 and may reveal findings that can be directly included in, or help to shape further iterations of the guidelines. For instance, over the course of the project we may develop insights specific to *different stakeholder groups*. If this is the case and sufficient empirical evidence has been gathered, the following requirement would then apply:

12. If the empirical analysis in WP 3 and WP 4 suggests how different groups of stakeholders may realise RRI, then this should inform the development of specific or related sections in the guidelines. For each such section, the name of the stakeholder group addressed should be included and the findings listed, which may include for example, the recommendations on how this stakeholder may facilitate RRI within their individual or organisational remit.

The GREAT project is contributing to a growing body of RRI research in both theory and practice. For example, there are a number of projects within the EU and elsewhere that are examining the concepts of RRI. We have discussed some of these in the preceding section, e.g. RRI Tools, FRRIICT, RESPONSIBILITY, PROGRESS, and RES-AGORA. The GREAT project guidelines therefore should *help stakeholders to navigate through the increasingly complex and diverse discussion on RRI.* For this purpose the current field of RRI is analysed in a landscape study, including literature, leading authors, institutes and projects presented in deliverable 6.4.2. Within the guidelines, stakeholders should be empowered to find their own relevant examples, and use these to generate best practices within their organisation and to develop their own context-sensitive interpretations. This therefore defines the final set of requirements:

13. In the main document, or in an appendix to the main document, the guidelines should provide a list of web links and references (bibliography) of a variety of relevant existing RRI approaches forums/observatories etc. including findings from the GREAT project. This should draw upon existing literature and utilize the resources currently being developed i.e. the FRRIICT tools for RRI, the guidelines and recommendations for civil society implementation of RRI in CONSIDER, and the forum and observatory for the dissemination of RRI in RESPONSIBILITY.

14. Each item in this list should be accompanied by 2-3 sentences describing the issues discussed in the source. For instance, the following comment could be attached to the

article:
"Developing a framework for responsible innovation" by Jack Stilgoe, Richard Owen and Phil Macnaghten (*Research Policy*, 2013):

The article discusses the principles of anticipation, inclusion, reflexivity and responsiveness, and explains a particular RRI approach, the so-called 'stage-gating process', by drawing on a case study on geoengineering, but also by providing implications for scientific research more generally.

5.2 General and Specific Requirements, Issues and Concerns

The requirements for the guidelines and recommendations defined above can be further refined by distinguishing between general and specific requirements. This helps steer the focus on specific needs of project areas, fields of enquiry and stakeholder groups. For instance, it is important to use simple (common, non-academic) language whenever possible, but when referring to a specific example or case such as, geoengineering, there may be a need to use some discipline specific or technical terms in order to better capture the related concrete governance and RRI issues. As far as possible these specific terms should then be explained in the glossary.

In addition, for all the 14 requirements initially proposed we identified related issues and concerns. These issues and concerns reflect some of the possible limitations of each of the requirements identified thus far. Some of the issues can be addressed at the development of the guidelines stage (Task 6.2). Thus we remain aware that when drafting the guidelines we may need to strike the right balance between different, possibly conflicting, yet equally important objectives, for example:

<u>Requirement number 2</u>

Requirement:
It is important to provide guidelines that are as concise as possible to be effective.

Issue/concern:
If we are 'too concise', i.e. explanations are provided that are too brief to be properly understood then the guidelines may not be effective as stakeholders may not follow our reasoning.

General and specific requirements as well as related issues and concerns are summarised in the table in the Annex. The initial table (appendix l) was evaluated for effectiveness, practicality and usability by stakeholders at the workshop on 17th September 2014. The changes, additions and feedback on the requirements table are detailed below.

6. Workshop and Subsequent Revisions

6.1 Method and Rationale

The approach to the workshop was conducted similar to a focus group, i.e. problem-centered group discussions moderated by the researcher (Krueger, R & M.A Casey, 2000). In the case at hand the discussion centered on the initial set of 14 requirements, as the workshop's intention was to evaluate and provide feedback and suggestions on these initial requirements. Participants were encouraged to reflect on these and any alternative or additional requirements for ensuring acceptance of the guidelines within their own experience, and in view of the context and norms of research and innovation practices within their discipline. In this way the workshop facilitated reflexivity whereby 'reflexivity asks researchers and innovators to think about their own ethical, political or social assumptions underlying and shaping their roles and responsibilities in research and innovation as well as in public dialogue' (D 2.2 p.17).

The structure of the workshop as indicated in appendix II shows the systematic way that each of the initial requirements were individually reflected upon and feedback gained about each one. The session then discussed ideas for improvement to the requirements (Appendix lll).

It should be noted that it was decided to hold both the focus group for Task 3.2 and the workshop for Task 6.1 on the same day. This had the benefit of providing input to both work packages 3 and 6 thereby reducing costs. This also had the benefit of enabling some participants to be involved in both sessions thus drawing more fully on their expertise. The documentation in the appendices lV and V therefore reflects the dual nature of the sessions on that day. However, the findings and perspectives of the focus group will not be reported here and will be discussed in the deliverable for Task 3.2.

6.2 Participants

The rationale for selection of the participants in the workshop to evaluate the requirements for the guidelines (Task 6.1) was based on an understanding that there are multiple possibilities when identifying and selecting stakeholders, some of whom may also have incompatible interests (Friedman and Miles 2006). The stakeholders invited to participate in the initial workshop were drawn from EU researchers and academics that are amongst those people who are the potential users of the guidelines and thus were considered to have an interest in both their design and development. It is expected that additional stakeholder groups will be included in the subsequent workshops in M24, M25 and M30 before the guidelines (D6.2) are finalised. The selection of these stakeholders will be informed by the findings of the other GREAT work packages and through discussion with experts within the consortium as part of the ongoing development of the guidelines handbook. The selection criteria were built on those utilised and approved by the consortium for the 'Cross-disciplinary cross-nation Context Workshop' (Task 3.1) and focus groups (Task 3.2). It was decided that this approach was appropriate as it provided consistency across the project and across work packages/tasks in conducting workshops and focus groups. Therefore, the criteria for the selection of participants and the format of the session closely mirror Task 3.1 but were adapted to the needs of Task 6.1.

- The participants are conducting international research ('cross nation')
- They work in different disciplines or on different research topics
- Technology or management may play a role in the research:
    - The expected outcome of the participants' research is a technology, management process or are technological procedures, that may be considered innovative;
    - alternatively, the research process itself involves technological components, management processes or technological procedures that may be considered innovative;

- alternatively, information and communication technologies (ICTs) are strong enablers for the scientific research.
- The innovation process, or the expected outcome, involves some risk or uncertainty.
- The participants are at different stages of their academic career (e.g. doctoral student; postdoctoral researcher; professor).

The selection process led to seven attendees at the workshop including four senior researchers; two post-doctoral researchers at different career stages and from a range of disciplines including management, technology, and computer ethics; one doctoral student; and two post-doctoral researchers. The participants included:

- two Professors currently involved in two European FP7 Projects
- one Postdoctoral / Research Associate involved in a UK based project and an European FP7 project
- one PhD student involved an a UK based project
- three Senior Lecturers/ Senior Research-fellows involved in several European FP7 projects

Of these participants, the Postdoctoral/Research Associate and one Senior Lecturer/Senior Research-fellow are in the early stages of their careers. The other participants are in mid-career stage and one senior stage.

6.3 Workshop Structure

In the first instance, a participant information sheet was provided along with two consent forms, one for retention by the project to indicate informed consent to be involved in the project, to give permission to record the session and confirming the right to withdraw their participation from the project and any resulting findings (appendix IV and V). The second copy was for retention by the participant themselves. There was an initial introduction to the project and an explanation of the expectations of the workshop. It was highlighted that the GREAT project is tasked with developing a set of guidelines and recommendations (D 6.2) that would be used to 'allow stakeholders to improve their approach to responsible research and innovation' (Description of Work, p.20).

Firstly there was a brief discussion of the requirements and what they are intended to be used for. This was followed by a point by point analysis and evaluation of the initial requirement table. Suggestions for improvement to the requirements were suggested both at the workshop and subsequently by email from several of the participants. The resulting revised requirements table is presented in section 7. Appendix lll contains the workshop discussion that informed the revised requirements in section 7.

7. Conclusions: Requirements for the Guidelines (Final Table)

After the workshop, the above perspectives and feedback from the participants were used to revise the initial requirements table. The revised requirements table was then emailed to all participants at the workshop for further feedback and review. No further feedback was subsequently received from them. In addition comprehensive, valuable feedback and suggestions about the requirements, was received by the consortium partners as a result of the GREAT internal review process. This led to the inclusion of requirement 11, requirement 6 being revised to include a small number of definitions, and requirement 10 to incorporate a greater understanding and acknowledgement of the pluralistic approach taken by the GREAT project. Further examination of GREAT project findings and deliverables was undertaken in light of the workshop findings and consortium partner feedback to refine the approach to constructing the final set of requirements. The table below therefore reflects the input from workshop participants, GREAT project findings and the feedback from consortium partners and constitutes the final version of the identification of requirements for guidelines which will be used as the starting point for the construction of the guidelines in Task 6.2.

Requirements for the Guidelines (Final Table)

	Constructive, process focused requirements	**Requirements specific to project, area of enquiry, or stakeholder group**	**Issues and Concerns**
1	Use a common language that overlaps all disciplines.	May require use of some discipline specific language (Glossary D2.1) for clarity and precision.	Over simplification or too much complexity in the discipline specific language may result confusion or the evasion of the 'spirit' of RRI in practice.
2	Be concise and ensure that the guidelines are practical and usable (bullet points etc.) as shorter documents are more likely to be read and understood.	Some projects, areas of enquiry or stakeholder groups may need detailed descriptions to ensure value and relevance.	If the guidelines are too brief it may lead to lack of clarity and detail.
3	Use good style to enhance readability (colours, diagrams, pictures, other types of media). Make the guidelines attractive and easy to understand.		Could trivialise or over complicate the message.
4	Provide an interactive document, e.g. links to RRI websites, case studies, providing examples of 'good'/'bad' practice or normative dilemmas, tools and resources, placing particular emphasis on findings from GREAT project research. The goal is to provide examples for discussion leading to organisational/individual learning.	To inform from the specific project, area of enquiry or stakeholder group as well as more broadly. Provide access to multiple sources and perspectives and provide a contextualised approach.	Information overload and accessibility issues.
5	Provide a cover page with the key points to provide a starting point for users of the guidelines.	Graphics and wording to aim at specific target audience.	Tone may be inappropriate, over simplification.
	Substantive, Content focused requirements		
6	Provide a small number of concise RRI definitions and other key terms that are tightly		Perspectives included in definitions may be limited or may create confusion or possible narrowing of

	coupled to the findings from GREAT. Also, provide a description of meaning, scope, and complexity within the document through links to the Glossary (D2.1).		perspectives.
7	Provide links to further definitions of RRI including those both perceived by the GREAT project and within the wider discourse to broaden awareness of RRI principles and to encourage the use of RRI theory to relate to user's own practice.		Perspectives included in definitions may be limited or may create confusion or possible narrowing of perspectives.
8	Provide methods to re-assess and challenge the guidelines including a regular review (this means that a key principle of RRI in GREAT's own guidelines should be considered: reflexivity).		If too flexible, may have little impact as the guidelines may be too weak to be effective.
9	Respond to existing frameworks, e.g. existing selection, funding and evaluation criteria for research projects) and relate the benefits and problems of RRI to such frameworks.	Identify and respond to aspects of EC framework that are specific to project, area of enquiry, stakeholder group.	May be too prescriptive. May not be accepted in other geographical regions. May narrow scope and constrain innovation or may create confusion due to contradictions.
10	If the pluralistic approach to RRI currently developed in GREAT goes beyond the scope of requirement 6 ('provide only a small number of concise RRI definitions'), deliberate on possible ways of representing this pluralistic approach without compromising too much on requirement 2 as there will always be trade-offs in requirements. This will be made according to their specific context and will consider the extent to which such a stakeholder-oriented and context-sensitive approach is feasible within the timescale of GREAT.		
11	If explicit norms of responsible behaviour are expressed in the guidelines, these norms should be established with the participation of stakeholders. (This requirement rests on one of the key findings of GREAT: 'good' governance implies,		

	among other things, that various actors participate in the making of the very norms they subsequently have to follow).		

8. References

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Appendix I Requirements, Issues and Concerns (Initial Table)

	General Requirements	Requirements specific to project, area of enquiry, or stakeholder group	Issues and Concerns
1	Use simple language	May require use of some technical language (Glossary) for clarity and precision Understandable and clear for non-experts	Over simplification or too much technical language may result in evasion of the 'spirit' of RRI in practice
2	Be concise and ensure it is practical and usable (bullet points etc). Shorter documents are more likely to be read and understood.	Some projects, areas of enquiry or stakeholder groups may need detailed descriptions to ensure value and relevance.	Too brief may lead to lack of clarity
3	Use good style to enhance readability (colours, diagrams, pictures etc.) Attractive and easy to understand		Could trivialise or over complicate the message
4	Provide an interactive document (e.g. links to RRI websites, case studies, examples of good/bad practice, tools and resources)	To inform from the specific project, area of enquiry or stakeholder group as well as more broadly. Provide access to multiple sources and perspectives, provide contextualised approach	Information overload and accessibility issues
5	Provide a range of RRI Definitions to broaden awareness of RRI principles and to encourage the use of RRI theory to relate to practice.		Perspectives included in definitions may be limited or narrow or conversely, information overload may create confusion.
6	Comment on RRI Definitions – description, scope, and complexity		Interpretive and limited, possible narrowing of perspectives
7	Include case studies – 'Bad' practices or normative dilemmas to provide examples for discussion and to identify specific stakeholder groups		Case studies may be limited or not sufficiently relevant
8	Include case studies – 'Best' practices to provide examples for discussion and to identify specific stakeholder groups		Case studies may be limited or not sufficiently relevant
9	Include RRI and governance tools – to provide examples for discussion leading to organisational/individual learning		Tools may not be useful or relevant
10	Acknowledge that tools and case studies provided may not always be relevant and should be adaptable to encourage stakeholders to produce new		If too flexible, may have little impact as too weak to be effective

	approaches based on their own experience and expertise		
12	Respond to EC framework, e.g. intervention logic model (relevance, effectiveness, efficiency, utility) and relate the benefits and problems of RRI to EC framework	Identify and respond to aspects of EC framework that are specific to project, area of enquiry, stakeholder group	May be too prescriptive. May not be accepted in other geographical regions. May narrow scope and constrain innovation or may create confusion due to contradictions.
13	Use empirical analysis (within the GREAT project) to inform development of guidelines. Avoid uncritical approaches and to facilitate specific development across the stakeholder groups. Provide background understanding of what each stakeholder group needs		Limited scope, could cause narrowing of perspectives to selected stakeholder groups
14	Provide information and explanations on existing RRI approaches and resources including web links and references	Facilitate awareness and understanding of domain specific approaches e.g. FRRIICT strengthens perception of the legitimacy of the guidelines in ICT.	Existing approaches may be limited or too complex or unsuitable

Appendix II Workshop

The Workshop entitled 'Workshop to Test Definition of Requirements for Guidelines' was held on 17th of December 2014 at the De Montfort University (DMU).

Aim

The GREAT project, as part of the Science in Society aspect of FP7, is tasked with undertaking research that can affect policy and further European goals. It is therefore of central importance that the research findings are translated into manageable and applicable recommendations and guidelines that allow stakeholders to improve their approach to responsible research and innovation in collaboration with the most important stakeholders and assess the usefulness and ease of use of the resulting guidelines.

The workshop will discuss and shape the requirements for the guidelines which will inform the development of the guidelines themselves and provide their feedback and viewpoint

Agenda	Time	Explanation
Welcome and introduction	5min	*Welcome the participants and introduction to the project and the principles of RRI*
Round robin introductions	5min	*Ask participants to briefly introduce themselves and their projects/research*
Defining the requirements for the guidelines	5min	*Explain what the requirements are for and how the participants can use their expertise to inform the development of the guidelines*
Roundtable discussion: **What is your understanding of the requirements?**	15mins	*Show the requirements table on a slide* - What is your understanding of the requirements for the guidelines? - How well do the existing requirements fit with your approaches to your own projects and research?
Discussion in small groups: **Evaluation and discussion of 3-4 requirements**	15-20mins	*Participants are asked to discuss the following questions in groups of 3-4 and to summarise their deliberations on a flip chart* - Are the requirements understandable - Do you think they would be useable/practical within your research? - What similarities and differences in approach did you find within your group? Did you find common practices? Or where there important differences across different projects, topics, disciplines, career levels?
Roundtable discussion	10mins	- Discussion of evaluation session
Roundtable discussion: **How can these requirements be improved to better fit with your discipline/research project?**	10mins	- Identify alternative or additional requirements - Identify any issues or concerns
Wrap up	5mins	*Thank the participants and ask for expressions of willingness to be involved in the workshop for 'Development of the Guidelines' (February 2015)*

Appendix lll Workshop Discussion

It was understood that there is a need for a consensus on what is meant by RRI in context and that there is also a need for definitions that are specific to individual projects. The participants discussed that this may create tension in applying some of the requirements, and concerns were raised that this could affect the usability of the resulting guidelines. It was acknowledged however that both elements are important and that this could be resolved in part by providing a single RRI definition as a starting point with links to additional approaches. It was felt that the guidelines should bridge the gap between RRI projects and the over-arching governance of RRI. E.g. it was commented that research and innovation are quite different concepts and yet often the 'research' element is excluded and some projects and may focus on responsible innovation exclusively. The workshop participants discussed the need to emphasise the importance of the research element as being intrinsic to RRI and that this should not be side-lined when developing guidelines.

In general terms, the participants indicated that the requirements should be presented in two distinct sections. The first section was seen to be focused on the construction and process of the resulting guidelines and the second to indicate the substantive content that should be included in RRI guidelines. This approach can be seen in the revised table and is indicated in the review discussion below.

The following section details the discussion and resulting revisions to each of the 14 initially developed requirements.

<u>Constructive, process focused requirements</u>

1. Use simple language

The term 'simple' was discussed and it was felt that that a more precise way to reflect this requirement was to use the word 'common' instead. The workshop discussion considered that the Multi and inter disciplinary nature of RRI means that finding a common language can often be problematic, hence the need for a glossary (D2.1). This should be included in the resources provided to assist the users of the guidelines to inform awareness of the core principles from which the guidelines are drawn, and to have a common understanding of the terms and concepts used.

2. Be concise and ensure it is practical and usable (bullet points etc.). Shorter documents are more likely to be read and understood.

The workshop participants acknowledged that it is important that the guidelines are concise, practical and usable. This requirement therefore remained unchanged.

3. Use good style to enhance readability (colours, diagrams, pictures etc.). Attractive and easy to understand

The workshop participants strongly recommended that 'a pitch to grab attention for example, a cover page with the key points' should be included as a requirement. They also indicated that by providing links to media such as YouTube videos on RRI related topics (linked to the initial requirement 4), would enable a greater level of access to potential users of the guidelines including students and future researchers than the provision of just text based documents, and was considered to be valuable and added to requirement 3 regarding readability and style.

4. **Provide interactive document (e.g. Provide links to RRI websites; case studies; examples of good/bad practice; tools and resources.)**

The interactive nature of the guidelines was discussed and the value of this approach was acknowledged. However, it was stressed that to establish the effectiveness of this approach it should be user tested to ensure that the design of the interaction is aligned to the needs and expectations of the users.

Substantive, content focused requirements

The workshop participants discussed and agreed that the first four requirements above should be seen as 'general' in nature, reflecting the process and means of access rather than the content. It is understood therefore that this initial set of general requirements should inform the process of constructing the following substantive ones i.e. conciseness.

The following set of requirements was considered to be substantive and is reflected in the format of the table to more clearly identify the two perspectives.

5. **Provide a range of RRI Definitions to broaden awareness of RRI principles and to encourage the use of RRI theory to relate to practice.**

This requirement was seen to not be in keeping for conciseness as indicated in requirement 2. Moreover, the participants' were concerned that providing multiple definitions, could lead to confusion and lack of understanding. Therefore it was recommended that the guidelines should provide *one concise definition* that is specific to the context of the guidelines in approaching the governance of RRI within the GREAT project. In addition it was suggested that the guidelines should offer links to other perspectives and definitions to promote and broaden awareness of alternative RRI approaches and perspectives, and thus aligned to requirement 4. It was also discussed that there is need for clarification with regards to what elements are to be directly included in the guidelines, and what elements are part of the supporting body of knowledge and resources. It was agreed therefore that multiple definitions of RRI should not be part of the guidelines themselves but that the interactive document should provide links to alternative definitions. This perspective was also considered to be true for requirements 6, 7, 8, 9 and 14:

6. **Comment on RRI Definitions – description, scope, and complexity**

This requirement was considered to be an extension of requirement 5 and should therefore be included in the external links to resources and not be included as an integral part of the guidelines themselves due to the need for conciseness.

7. **Include case studies – 'Bad' practices or normative dilemmas to provide examples for discussion and to identify specific stakeholder groups**

It was acknowledged that it is important to provide resources that highlight where problems have arisen, what the impact of bad practice has been and how different approaches could have led to a more positive outcome. It was again felt that inclusion of this requirement in the guidelines themselves would substantially increase the size of the guidelines and thus should be included as links but not as direct content.

8. **Include case studies – 'Best' practices to provide examples for discussion and to identify specific stakeholder groups**

In addition to this requirement also being included solely within the links to resources on RRI, it was also discussed that the use of the term 'best' to describe where RRI principles have been included within the research or innovation processes was problematic. The term 'best' was felt to be too limiting in its approach and could lead to confusion as to how to identify which practices are better than others. To address this concern the term 'best' should be replaced with 'good' to better reflect the range of practices that adhere to RRI principles without the need to scale these approaches or to rank them in order to identify which is better than the other.

9. Include RRI and governance tools – to provide examples for discussion leading to organisational/individual learning

Again, this requirement was identified as important for context and yet to maintain conciseness within the guidelines, would be better placed as a resource link rather than as an integral part of the guidelines themselves.

10. Acknowledge that tools and case studies provided may not always be relevant and should be adaptable to encourage stakeholders to produce new approaches based on their own experience and expertise.

Whilst flexibility was discussed as being important, particularly where there may be discipline specific needs the ability to re-assess both the guideline process and the substantive elements should be included. This could involve a regular review of the guidelines themselves in addition to the flexibility to revise the guidelines to ensure relevance to each stakeholder group.

11. Omitted

It was realised that an oversight had led to there being no number 11 in the initial list of requirements.

12. Respond to EC framework, e.g. intervention logic model (relevance, effectiveness, efficiency, utility) and relate the benefits and problems of RRI to EC framework.

When discussing the European Commission framework, concerns were raised about the possibility that such frameworks can lead to a 'tick box' approach. However, it was discussed that such a regime is often a desired approach of researchers and decision-makers, who are frequently focused on ease of use and perceived compliance, and may not critically evaluate the reasons or meaning behind the frameworks they are following. Therefore, such framework approaches were perceived to be acceptable if they are included alongside the other resources provided by the guidelines so that researchers and innovators can become informed about RRI.

13. Use empirical analysis (within the GREAT project) to inform development of guidelines. Avoid uncritical approaches and to facilitate specific development across the stakeholder groups. Provide background understanding of what each stakeholder group needs.

Whilst this requirement was considered important in that there should be a direct and explicit link to the work of the GREAT project in informing the development of the guidelines, the actual empirical findings and conclusions would not be included directly in the guidelines themselves, but a link could be provided to the GREAT project website.

14. Provide information and explanations on existing RRI approaches and resources including web links and references.

This requirement was considered to mirror requirement 4 and should therefore be integrated into that requirement alongside requirement 6.

Appendix lV Participant Information

GREAT (Governance of responsible innovation) Focus Group and Workshop

Participant Information

Focus Group

The focus group will discuss and consider emerging patterns and identify themes of RRI. EU funded researchers will be asked to reflect upon, and provide their feedback and viewpoint regarding the ways in which responsible research and innovation (RRI) is identified, debated and decided upon.

Workshop

The GREAT project, as part of the Science in Society aspect of FP7, is tasked with undertaking research that can affect policy and further European goals. It is therefore of central importance that the research findings are translated into manageable and applicable recommendations and guidelines that allow stakeholders to improve their approach to responsible research and innovation in collaboration with the most important stakeholders and assess the usefulness and ease of use of the resulting guidelines.

The workshop will discuss and shape the requirements for the guidelines which will inform the development of the guidelines themselves and provide their feedback and viewpoint

These focus group and workshop are being conducted by Dr Sara H Wilford and Professor Bernd Stahl (both from De Montfort University, Leicester, UK), members of the Centre for Computing and Social Responsibility (http://dmu.ac.uk/ccsr), one of the foremost centres of its type in Europe.

During the focus group some of the questions that may be discussed are:

1. What is your initial understanding of the themes of 'Privacy and data protection', 'Governance' and 'Responsibility'?

2. How do you consider these themes within your own EU project

3. What criteria would you consider useful for guidelines that would facilitate researchers to address these themes in their work?

During the Workshop some of the questions that may be discussed are:

1. What is your understanding of the requirements for the guidelines?
2. How well does the existing requirements fit with your approaches to your own projects and research?
3. Are the requirements understandable
4. What similarities and differences in approach did you find within your group?

The focus group and workshop will take place at DMU and will be audio recorded. The recorded content of the interview will be kept securely at De Montfort University. Only staff at De Montfort University's CCSR, involved in the GREAT project will have access to the full recordings. Neither De Montfort University nor their collaborating partners will use the recordings or transcripts for any other purpose than the study describes. Understanding this, I give permission for these individuals to have access to my focus group data.

You have the right to change your mind about the use of the information provided up to the moment of publication. You can inform the researchers via email of your change of intentions up to this point.

In order to contact the researchers to discuss questions about the interview or your consent to participate, you can contact us at:

sara@dmu.ac.uk or bstahl@dmu.ac.uk

Or you can call

+44 116 250 6294

We look forward to your participation.

Appendix V Consent Form

GREAT (Governance of responsible innovation) Focus Group and Workshop

Consent form

Issue	Respondent's initial
I have read the information presented in the participant information document about the Focus group and workshop	
I am aware that the language of sessions will be English. I understand that the focus group and workshop will be conducted in English and that the transcript will be made available to me in that language, should I request it.	
I have had the opportunity to ask any questions related to this research, and received satisfactory answers to my questions, and any additional details I wanted.	
I am aware that excerpts from the focus group and workshop may be included in publications to come from this research. Anonymous quotations will also be used in publications where these refer to material not otherwise published.	
I give permission for the interview to be recorded using audio recording equipment	
I am aware that I have the right to change my mind about the use of the information provided up to the moment of publication. I am aware that I can inform the researchers via email of my change of intentions up to this point.	

I understand that every reasonable effort will be made to keep confidential data securely. Any recordings or transcripts will only be viewed by the research team at De Montfort University and their collaborating partners from the GREAT project. Neither De Montfort University nor their collaborating partners will use the recordings or transcripts for any other purpose than the study describes. Understanding this, I give permission for these individuals to have access to my interview data.	

With full knowledge of all foregoing, I agree to participate in this interview.

Participant Name:	
Participant Signature:	
Date	