

ASSESSING THE IMPACT OF SSH–RRI APPROACH ON ICT RESEARCH & INNOVATION: THE HUBIT PROJECT

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ABSTRACT

The development of information and communication technologies (ICT) introduces radical changes in our lives. These technologies provide answers to a multitude of people needs, but at the same time they increase the concerns about their actual threats and societal impacts. This calls for adopting a responsible research and innovation perspective in the process of developing ICT solutions. This paper presents preliminary results of the “Social Impact Assessment” (SIA) plan and tools that were developed within the EU-funded HubIT project. The study employed both quantitative and qualitative ethnographic tools (e.g. survey questionnaire and observations), in order to address the challenge of conducting a “Responsible Research and Innovation” (RRI) assessment of a European project, focusing on promoting RRI. The project aims at creating an ecosystem that encourages interactions between ICT developers and “Social Sciences and Humanities” (SSH) researchers to ensure responsibility in ICT research. First results indicate an increase in understanding and awareness of the SSH-RRI approach among SSH and ICT researchers and an increase of future plans for collaborations between these two groups. Conclusions are made as to how these results can be fed back into the HubIT project, as well as serve as a basis for the policy recommendations to European and national bodies.

INTRODUCTION

The development of ICT introduces radical changes in our lives. These technologies provide answers to a multitude of people needs, while at the same time increasing concern about their threats and societal impacts. This calls for adopting a “Responsible Research and Innovation” (RRI) perspective in the process of developing ICT solutions. The core of this approach is creating a mutual dialog between SSH researchers and ICT researchers and developers. Indeed, in the year 2012 the European Commission adopted the SSH-RRI approach and defined it as a continuous engagement of societal actors during the whole research and innovation process in order to better align both the process and the outcomes of their research with the values, needs and expectations of “European Society” (European Commission, 2012). Further on, RRI was introduced as a cross-cutting political aim in the “7th Framework Programme of the European Union” and it continues to be a key concept in the current “Horizon 2020 Programme”.

The HubIT project, funded under the topic “Boosting inclusiveness of ICT-enabled research and innovation” (REV-INEQUL-09-2017) is part of the overall SSH-RRI approach. It aims to bring together ICT developers, SSH researchers and other stakeholders (NGOs, citizens and users) across H2020 ICT-related projects and beyond, in order to attune ICT development with societal needs and foster the SSH-RRI approach.

THE CONCEPT OF “RESPONSIBLE RESEARCH AND INNOVATION” (RRI)

One of the more widely accepted definitions of RRI that emphasises the role of SSH researchers, was developed by Von Schomberg (2013). According to this definition “Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products.” (Von Schomberg, 2013, p.19).

Further elaboration of these ideas by the appointed European Commission (EC) expert group described six major dimensions of RRI that signify the importance of keeping to the norms of responsible research and innovation that considers different societal needs. Among them are: public engagement, gender equality, science education, open access, ethics, governance. Two additional dimensions, sustainability and social justice, overlap with the previously named ones (Strand et al., 2015). All these dimensions require the involvement of SSH experts in the process of ICT development.

Embedding SSH researchers into ICT research and innovation is a challenge. The integration of the SSH-RRI perspective into ICT research and development is accompanied by specific problems. Jirotko (2017) identified the following: First, the difficulty to predict potential uses of ICT research outcomes since uncertainties in this field are socially shaped and fixed rather than scientific and not fixed. A second difficulty stems from the difference in the quicker “rhythm” of ICT development compared to other fields, as software may be developed and potentially go viral in the same day. Third, there is a problem stemming from different disciplinary languages involve in ICT research, that makes interdisciplinary work more difficult.

These difficulties created the need to consider social aspects in the process of ICT development and led, among other things, to initiate the HubIT project. The HubIT project (runtime: 2017-2020) aims at activating a constructive interaction between SSH researchers and ICT developers, in order to implement a socially responsible approach to research and innovation in ICT projects. This approach – termed the SSH-RRI approach – is at the centre of the assessment activities of the HubIT project.

ASSESSING THE SSH-RRI APPROACH

For assessing the SSH-RRI approach in the HubIT project, the “Social Impact Assessment” (SIA) methodology was adopted. This methodology is defined as “*the process of identifying the future consequences of current or proposed actions, which are related to individuals, organizations and social macro-systems*”. (Becker, 2001, p. 312). Becker describes this methodology as having two phases: a) An initial phase, including an analysis of the problem. In the case of the HubIT project, identifying some negative consequences of ICT development, system analysis and project design; and b) A main phase, including scenario planning, strategic design and an assessment of impacts. Vanclay et al. (2015) followed this scheme and prepared a guide to social impact assessment. The guide included 26 tasks that are divided into four phases: 1. Understand the issue; 2. Predicting the likely impact; 3. Developing and implementing strategies to mitigate negative societal consequences; 4. Design and implementing monitoring programmes. Since many of the tasks specified by Vanclay et al. (2015) can be found within the HubIT project activities, the assessment plan focused on these tasks. These activities have specific formats (e.g. workshops, conferences, hackathons etc.), target different audiences and lead to different outputs (e.g. an online platform, visual materials, reports or policy briefs). The variability of the activities dictates different tools and evaluation criteria needed for the assessment.

THE DESIGN OF THE ASSESSMENT PLAN INCLUDES THREE STAGES:

The first stage was to map out the characteristics of each activity i.e. specifying the main objectives, expected outcomes and relevance of the RRI dimensions which are part of each activity.

The second stage focused on the identification of the relevant types of indicators, measures and questions that tackle each of the six RRI dimensions. This stage started with a comprehensive review of the RRI-related evaluation efforts conducted by other projects, such as “Doing It Together-Science” (DITOs), “Monitoring the evolution and benefits of Responsible Research and Innovation in Europe” (MoRRI), RRI Tools, etc., as well as with the review of the more theoretical studies (Blonder, Rap, Zemler and Rosenfeld, 2017; Von Schomberg, 2011) and several reports from the European Commission (2012, 2013, 2015) on RRI. Consequently, a bank of assessment measures and questions was created.

The third stage involved a round table discussion (called the “HubIT game”) where the partners, responsible for certain tasks, were asked to discuss and select from the bank of assessment measures and questions with respect to those that cover the relevant RRI dimensions that appear

in those specific tasks. Based on the results from the discussions held in the groups, specific tools were designed for assessing the implementation of the HubIT events.

In addition, the SIA methodology included a qualitative evaluation part that focused on the narratives that accompany the interaction between SSH-ICT researchers during the activities. The need for a more qualitative approach arose already at the literature review stage. It became evident that a certain dissonance between the current state of the art in the field of RRI impact assessment and the actual evaluation practices exist. Evaluation practices, promoted by the funding bodies, national and supranational authorities, provide encouragement to be *accountable* (tick the boxes), but are not always *responsible* (reflexive, oriented towards strategic societal goals) in the meaning of being accepted in the RRI research community. Current forms of evaluations mainly do not look at the process, and the evaluation is conceptualised as something “outside” of the project, while in reality it is usually deeply embedded in the project practice and is conducted by project partners. This can be connected to the recent findings of Felt (2016), who warned about the danger of the emphasis on RRI and other SSH-related practices in science and innovation turning into a simple “*annex ritual to be performed at the beginning and at the end of the project*” (Felt 2016:15), encouraging accountability, but not reflectivity.

In this way, by employing process oriented ethnographic methods, the evaluation efforts became also partially shaped by the community, surrounding the project, and partially driven by a desire to comprehend and improve transdisciplinary and responsibility of the project. In this sense, a community was formed around the evaluation activities, actively engaging partners and stakeholders in the process of assessment.

THE ASSESSMENT ACTIVITY

Assessment activities that were enacted in the first two project-specific events are in the focus of the following section. These events were meant to bring together members of the ICT and SSH communities, public sector representatives, policy makers and other stakeholders. The events intended to present the concept of RRI, the HubIT project and the “European Framework Model” (a platform that was developed and presents the various resources and activities of the project). The events also aimed at identifying societal needs that are associated with technological developments and supported matchmaking between ICT developers and SSH researchers.

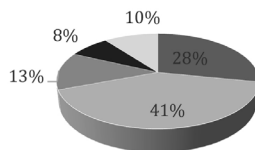
The assessment activities were conducted during a national workshop in Slovakia in May 2018 and a triple event (annual conference, workshop for social scientists and speed-dating) in Tartu in September 2018. The aims of the national workshop, as well as the Tartu events, were to raise awareness and understanding of the role of the SSH-RRI approach and to boost collaboration between SSH and ICT research communities. The workshop event in Slovakia included 27 participants. 20 out of them responded to an online questionnaire that dealt with the above explained aims. In total, 64 persons participated in the events organised in Tartu (Annual Conference, SSH workshop, networking session). Again, 20 participants responded to the questionnaire.

The evaluation activities meant to answer the following questions:

1. To what extent did the event succeed in targeting members of the ICT and SSH communities?

2. To what extent did the event contribute to mutual understanding of the ICT and SSH communities in the benefits of bridging between them?
3. To what extent did the event contribute to identifying societal problems that stem from ICT development?
4. To what extent did the event contribute to collaborative teamwork of ICT and SSH researchers?
5. To what extent did the event contribute to the acceptance of the RRI approach along its six dimensions?

The assessment tools that were generated at this stage of the project represented two modes of assessment: a quantitative tool, which includes an online questionnaire with 20 items, and a qualitative tool, which includes an observation guide for outside observers. The observation activities focused not only on the overall organisation and implementation of the event, but also on the dynamics of interaction between SSH and ICT communities, as well as on the narratives, surrounding RRI. Observations also included ethnographic notes taken by the project partners during the events, based on participants' discussions (as each event devoted a significant amount of time to world café style discussions). The main aim of the qualitative evaluation activities was to collect and analyse the *narratives*, surrounding the concepts of RRI, research inclusiveness and, especially SSH-ICT interaction. These narratives allowed identifying possible weak points of the project structure and unforeseen challenges that the project needs to address, as well as recent developments in the discourse of RRI.



- Information and communications technology
- Social sciences
- Humanities
- Public administration / decision making

Figure 1. Distribution of participants in the events by discipline.

RESULTS

SURVEY RESULTS

Figure 1 presents the distribution of the respondents who participated in the two events according to their discipline or field of activity ($N=39$).

Most of the participants represented social sciences (41%) and humanities (13%), mainly because these two events specifically focused on this target group. However, the amount of involved ICT researchers and specialists is still high (28%). The number of public officials and decision makers is relatively small, and will increase in future events.

THE BENEFIT OF BRIDGING BETWEEN THE TWO COMMUNITIES IN SUPPORT OF AN RRI APPROACH IN ICT DEVELOPMENT.

Figure 2 presents respondents' perceptions regarding the interaction between SSH and ICT in support of RRI approach. The highest level of support is related to the statement about the usefulness of SSH collaboration in ICT development (Range: Likert scale from 0 to 5; *Median (M)* = 4.3, *Standard Deviation (SD)* = 0.66), while the lowest level of support is connected to the perception that SSH is a burden to ICT research ($M = 1.70$, $SD = 0.983$). Despite the fact that the national workshop and the events in Estonia had somewhat differing target audiences and distribution of participants by discipline (national workshop was focused on a more diverse audience, while the Tartu events focused specifically on SSH researchers), results do not show major discrepancies between attitudes and perception of participants.

AWARENESS OF THE CONTRIBUTION OF SSH INVOLVEMENT IN ICT DEVELOPMENT TO THE IDENTIFICATION OF SOCIETAL PROBLEMS

Figure 3 presents the respondents' awareness of the contribution of SSH-ICT collaboration to the identification of societal needs and problems, as well as the production of solutions to these problems. The respondents found that participation in the workshop helped them on a medium to high level in terms of three aspects: learning about societal needs, identifying societal problems that can be solved by cooperation between ICT and SSH communities and finding partners for future collaborations.

PERCEIVED OPTIONS AND WILLINGNESS FOR ICT – SSH COLLABORATION

Based on the two events, most of the participants (80%-83%) foresee future engagement in cooperation with people from the other fields (ICT or SSH), and most of them (77%) found that the workshop event was very useful ($M = 4.03$). Additionally, based on the speed-dating event evaluation, 77% of participants foresee engagement with ICT researchers, 33.3% have already contacted a person they matched during networking and 55% plan to do so.

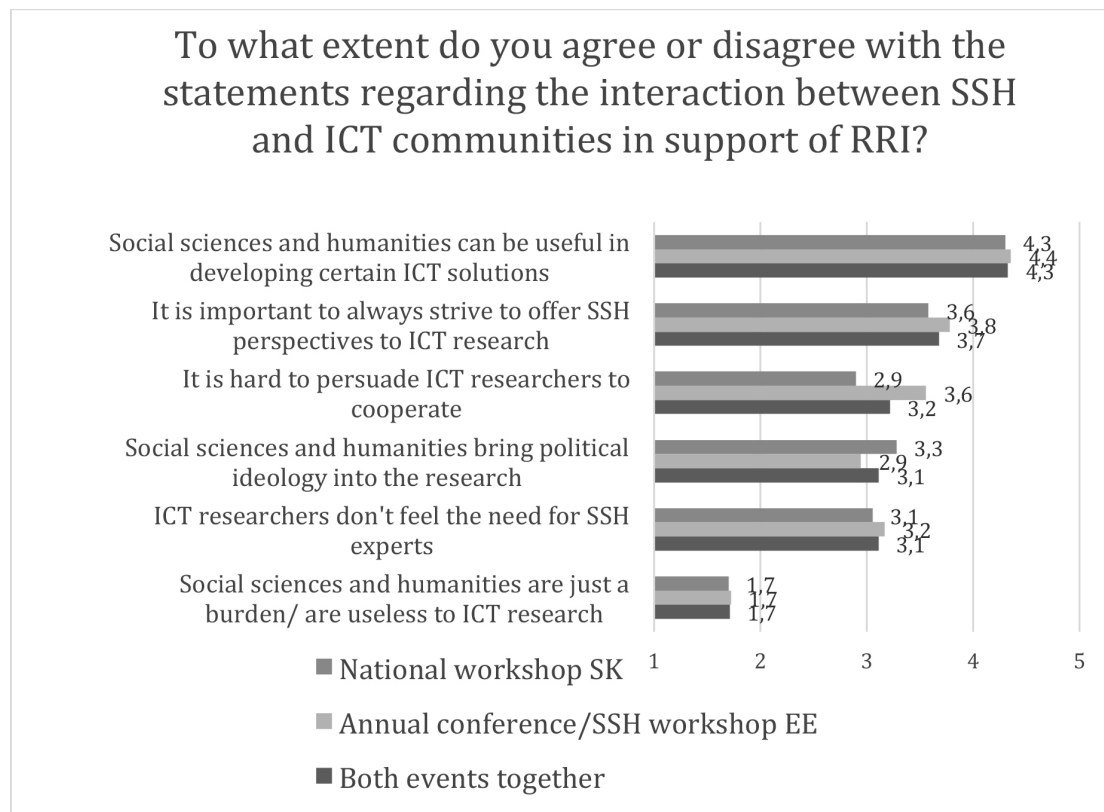


Figure 2. The interaction between SSH and ICT in support of the RRI approach during events in Slovakia (SK) and Estonia (EE), on a scale from 0 to 5.

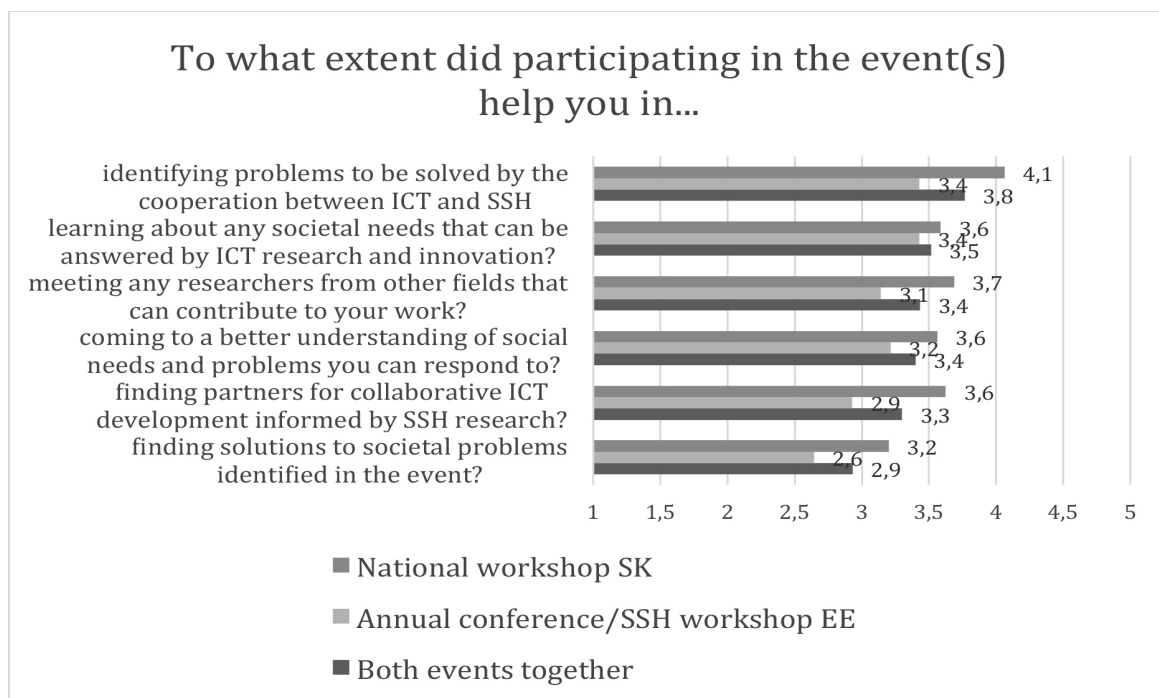


Figure 3. Contribution of SSH involvement in ICT development.

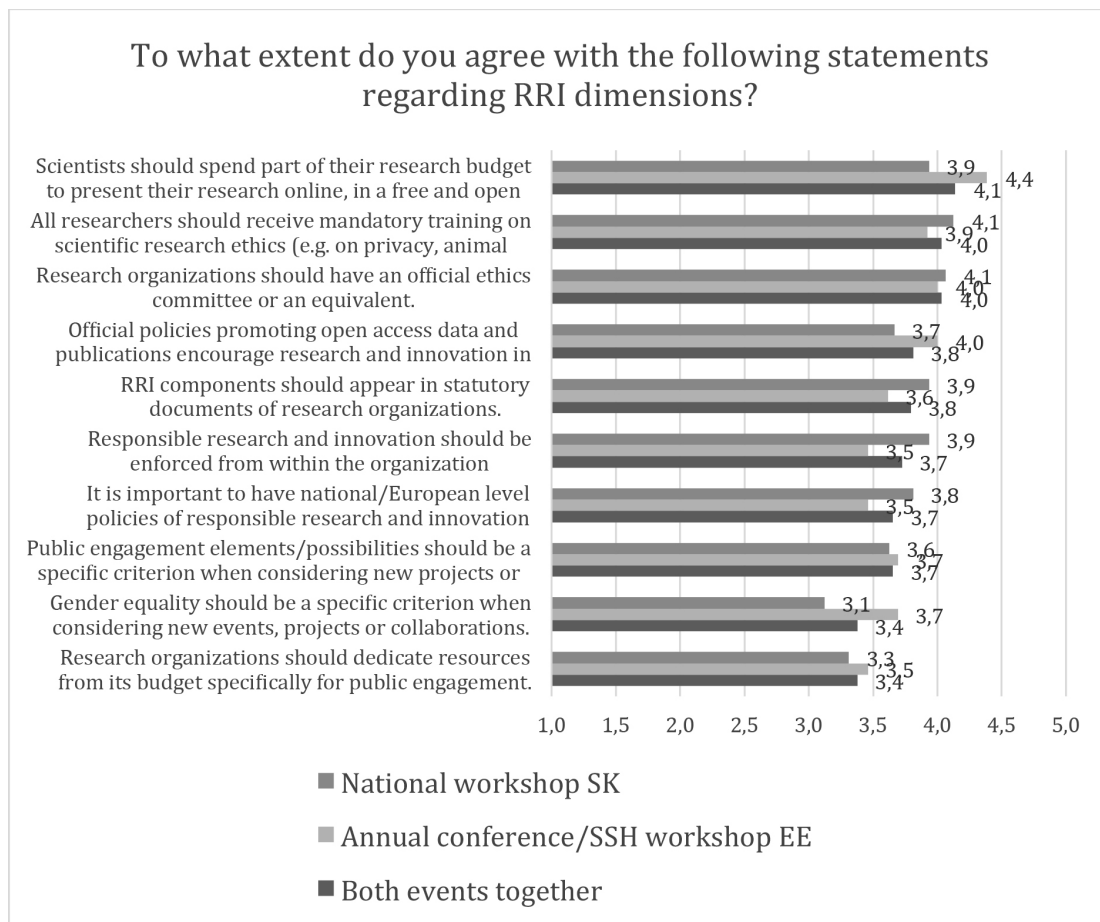


Figure 4. Perception regarding the six dimensions of RRI.

UNDERSTANDING AND ACCEPTING THE CONCEPT OF RRI

Concerning understanding of the concept of the SSH-RRI approach, most of the respondents (62%) indicated that they improved their understanding of this approach to a high or very high extent. Significant differences were found between the two events: for the national workshop $M = 4.17$, $SD = 0.85$ and for the annual conference/SSH event $M = 3.00$, $SD = 1.6$.

The participants' agreement with statements reflecting attitudes towards the RRI various dimensions ranged from a medium to a high level (see figure 4 below). Specifically, those related to open science and ethics dimensions, which focused on the need for official ethics committees in organisations and mandatory training on research ethics.

As concerns the national workshop in Slovakia, the respondents indicated that the six RRI dimensions were addressed exceptionally well during the workshop, especially the dimensions of: public engagement ($M = 4.00$, $SD = 0.78$), gender equality ($M = 4.33$, $SD = 0.9$), open access ($M = 4.00$, $SD = 1.1$), and governance ($M = 4.06$, $SD = 0.97$). The annual conference event in Tartu had more moderate scores ($M = 3.31$, $SD = 1.6$ to $M = 3.77$, $SD = 1.16$) for the different dimensions.

To sum up, the results from the two events indicate the success of this type of event in raising understanding and awareness of an SSH-RRI

approach and initiating future collaboration between actors, representing SSH and ICT.

Based on the qualitative part of the assessment the following narratives were identified:

QUANTIFICATION OF "RESPONSIBILITY" AND THE TICK-BOXING LOGIC

"I feel that RRI is a fancy term that European Commission has come up with that is more often than not used as an empty signifier (i.e. it is just put into documents without following the principle)" (Participant, expert workshop in Rome)

One of the first events organised by the HubIT project – the expert workshop in Rome – brought forward concerns that would accompany project discussions from this point forward. The issue of quantification of responsibility – that RRI can be reduced to a simple list of quantifiable key performance indicators – was discussed at length. Later, this narrative was echoed during the SSH workshop in Tartu: fear that RRI is just something that needs to "checked", but not followed in spirit, was brought forward from the comment section of the event report to the questionnaire (part of event evaluation).

However, we interpreted this narrative as an opportunity to improve our own HubIT practices, which prompted efforts to add a qualitative/

ethnographic component to the HubIT evaluation activities – to continuously engage with the qualitative data, to collect as much observations as possible and to be flexible in the implementation of project activities. Additionally, it was decided that each activity within the HubIT project will undergo an ethnographic qualitative process, especially the planned events, which constitute the core of the HubIT project. Thus, evaluation efforts shifted the focus to narratives, open-ended questions in surveys, discussion note-taking, “ethnographic” analysis of event artefacts such as posters and observations notes.

“SSH BRINGS IDEOLOGY AND POLITICS INTO SCIENCE.”

An unexplored topic emerged from the participants:

“I became aware that PC [political correctness culture] would creep into ICT research” (Participant, expert workshop in Rome)

“I am aware of the EC research ideology...” (Participant, expert workshop in Rome)

We provide an interpretation of the examples above in two ways: on the one hand, ethics sometimes is perceived as a complicating factor for research (often its bureaucratic and forceful nature is cited). On the other hand, it can be speculated that no representative of the modern research community would argue against the following ethical guidelines and the spirit of responsibility at their universities. RRI though, as a relatively new term coming from the European Union, a supranational structure, does not carry the same degree of legitimacy, which would explain the conceptual linkage that respondents made between RRI and the ideology of political correctness (avoidance of expressions that might negatively impact marginalised groups), currently associated with the political left. Additionally, the processes of globalisation of information flows and mediatisation (dominant role of (digital) media in framing the discourse) have definitely contributed to the polarisation of societies and rise of populism worldwide. RRI ideally should not be seen as a right/left issue, but as an objective need to consider societal considerations in formulating and implementing research ideas. However this suggests that we might be faced with a reality of politicisation (attribution of political agenda) of the term.

GENDER EQUALITY

Moreover, some additional insights came from event observations (which complemented open-ended questions of the surveys):

“ICT representatives were mainly men while the SSH area was represented mainly by women. This provides the feeling that SSH is something that women fight for. For instance, in the conference panel men (ICT) formulated their messages softer, while the woman speaker (SSH) was more a “right-fighter.” (Observation, Slovakia national workshop)

Observations of both events proved that often some aspects of event implementation go unnoticed by organisers. Gender equality is the dimension of RRI that, in the experience of the HubIT project, is most visible and causes the most debate. External observers’ feedback pointed out the imbalance in the presenters (male over female), while also emphasising that female participants make up an active part of the audience, often bringing up the value of the diverse perspectives in ICT product development and the importance of considering gender aspects in some research problems.

THREATS VERSUS OPPORTUNITIES

The following quotation highlights the tension between SSH and ICT researchers:

“ICT representatives talked rarely to the SSH people (experience based on one table)... ICT people seemed to be more involved (engaged) in the threats discussion, while SSH more in the opportunities.” (Observation, national workshop in Slovakia)

While there is a general presupposition that SSH researchers emphasise responsibility, risks and threats when discussing innovation, and ICT researchers look more into opportunities, this particular example showed an opposite picture. It might simply reflect the current state of the general discourse on innovation and global development: while the backlash against “irresponsible” ICT innovation has made more ICT researchers aware of the risks and pitfalls they might face, the strengthening narrative of “SSH inclusion” has encouraged social scientists to approach the issue of ICT/SSH cooperation more proactively.

CONCLUDING REMARKS

The assessment activities that were carried out in the first quarter of the project’s life-time were mostly focused on the Vanclay et al. (2015) first and second Social impact Assessment (SIA) evaluation phases (e.g. learning and understanding the project). Even in these relatively early stages of the HubIT project some specific characteristics of the HubIT assessment activities emerged. First, due to a predefined responsible assessment strategy decided by all partners, the assessment activities were found to be deeply embedded in the project. Full engagement of all partners was therefore achieved. Second, the assessment activities are an ongoing process which will evolve in accordance with the progress of the project. This allows for continuous adjustment of the project activities. Third, in the course of the evaluation activities, the importance of interactions with the transdisciplinary community of experts from SSH and ICT became evident. This suits the project’s goal to form a community around the evaluation activities, actively engaging partners and stakeholders from different fields in the process of assessment.

General event dynamics hinted that in discussing RRI two main associations appear: societal good (e.g. challenges of privacy, Artificial Intelligence, robotics, etc.) and inclusion (especially gender topics). The analysed narratives suggest that some RRI dimensions might carry more “pressure” than others, and that RRI in itself, should not be treated as a neutral concept. Conversely, it can be presupposed that there is a power struggle involved – even in the light of the increasing pressure to ensure responsibility of research and innovation. Especially in the field of ICT, the discourse of RRI is sometimes interpreted as a discourse of dominance, exerted by the social sciences over other disciplines. An important take-away is to ensure that the “responsibility” and ethics are not seen as special dimensions, monopolised by the social sciences. Rather, the discourse of RRI should be a space for reflection, where multiple ideas and perspectives are welcome.

During the evaluation process a need was identified to complement the survey type of assessment with a more ethnographic type of assessment through observations. This was done through introducing and emphasising open-ended questions in surveys, discussion note-taking during events and ethnographic observations. Based on the narratives extracted it was concluded that the inclusion of SSH perspectives into

ICT research, as well as encouraging ICT-SSH cooperation has gained momentum at the backdrop of societal calls for more responsibility and reflexivity in handling ICT innovation – challenges of data security, algorithms, and information flows are on everyone's mind. However, the main hurdles to transdisciplinary cooperation have to do with the following: social sciences and "responsibility in research" seem to be tightly linked, to the point where there is a risk that the value of engaging SSH perspective in ICT is not seen beyond the areas of RRI and ethics. Moreover, there is a risk that forcing "responsibility" into some disciplines might only lead to further quantification of RRI and an escape from the need to reflect. Further interactions with the ICT/SSH community in the context of HubIT endeavours to build transdisciplinarity are expected to outline directions of future work. There is a need to develop and communicate new evaluation practices, and this presupposes a new view of RRI and the role of social sciences, as well as the way they are presented and promoted by national and European bodies.

The HubIT evaluation activities are still in progress. Different evaluation activities will take place and more insight will be available in the future. Further interactions with the SSH and ICT community are expected to contribute towards the directions of future work.

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