CANDID
Checking Assumptions aND promoting responsibility In smart Development projects

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1. Introduction

This report is the work of Work Package 5, (WP5: Discourse-Analytic Contributions) and it has a dual function: (i) It aims to bring together discourses on smart technologies, systems and associated developments (hereafter, *discourse of smart*), explored in the CANDID case studies: 1. *User and Design Configurations*, 2. *Risks, Rights and Engineering*, 3. *Sensing Infrastructures*, and in WP5, *deconstructing the policy discourse*; (ii) It aims to function as a guide, a starting point for peers who wish to employ discourse-analytic methods to study innovation discourse in general, and to apply them to deconstruct the discourse of smart in particular.

This work is based on key objectives of the CANDID project, to open up communications across the Social Sciences and Humanities (SSH) and Information and Communication Technologies (ICT) disciplines, to improve upon mutual understanding, to deconstruct the dominant language in use and check the assumptions embedded in the discourse of smart. CANDID has brought together peers for this purpose, those of the CANDID partnership along with peers who belong to the SSH and ICT disciplines and innovation policy with one or another investment in smart developments. Manifestations of smart have, therefore, been interrogated in peer communications, in seeking the reactions of peers to texts about smart developments written by the researchers of the CANDID case studies, followed by a number of interviews (*deliverables 2.1, 3.1 and 4.1; see* http://candid.b.uib.no/objectives/insights/). Additionally, WP5 has concentrated on manifestations of smart in innovation policy, focusing on EC p olicy documents, and by interviewing the actors implicated in these documents such as policy makers, advisory group members and user group representatives. Furthermore, a workshop was recently organised to bring together peers to check our analytic insights with them across the case studies. Cross-checking assumptions has therefore taken place through a process of peer input, of analysis and then further peer feedback.

Deliverable 5.1 concentrates on the analytic work in this process, explaining the unique contributions discourse-analytic methods can bring to this sort of discourse, however, providing a taster rather than an exhaustive account of the discourse-analytic insights gained so far within and across the case studies and WP5.

In the following, we first give an overview of the discursive materials, how they were chosen and analysed to make visible the instruments of rhetoric and argumentation. We elaborate on the subject matter – smart technologies, systems and associated developments – in reference to the objectives and aims of the CANDID project, as well as their place in wider innovation practice and policy in Europe. Thereafter, we divide our analysis into three sections. The first looks at constructions of 'smart', the second looks at talk about interdisicplinarity and working across sectors, and the third looks at constructions of agency – human and non-human – how they are included/excluded and managed. The concluding section draws together the findings of this work and discusses some of their consequences.

2. Background to the work and method

Discourse-analytic methods are particularly effective in our view, at fleshing out the consequences of rhetoric and argumentation. In reference to innovation policies, politics and practice, the consequences are not well understood among the actors who are in one or other capacity involved or implicated in the innovation process. The consequences for those who are the presumed key beneficiaries *in practice*, the so-called end-users among the citizenry, are not well understood either. But, *innovation talk and text* construct innovation phenomena through depictions and display that are active meaning and world-making gestures using argumentative and rhetorical strategies. Talk and text are generative in the sense that they constitute the phenomena they are constitutive of, and they are performative, for example, of the powers of orientation, persuasion and reification. They are key in marshalling resources and building networks, and effective at including select actors and entities, while excluding others. The work of communication is also in and of itself an instrument of positioning, of performing authoritatively and knowledgeably, to signal belonging and in other ways to acquire legitimacy regarding an agenda, a message, propaganda, and so on.

All of these elements are in play in the discursive materials the CANDID partners have been working with, ranging widely from policy, research and innovation agendas, documents on empirical explorations to scholarly reflection—all of which has been used to direct written and oral communications with peers across the SSH, ICT and policy domains. The CANDID project focuses perhaps rather narrowly on smart technologies and systems in choosing specific areas of development: smart infrastructures (e.g., the smart city), users and designs (e.g. smart homes, smart care and energy use), and the engineering of data, privacy and rights protections. The naming of technological solutions as 'smart' and what that can stand for, stretches much further afield. Similar notions have been a 'hot' topic in electronics engineering and materials science going back to the 1990s. They incorporate various ways of talking about how to take innovation into the 21st century, e.g., *ubiquitous computing* (Weiser, 1991) and *ambient intelligence* (Aarts and Marzano, 2003). This *innovation talk* has taken on an assortment of guises, however, sharing a vision of integrated networks of computing and communications systems for smarter or more intelligent (and more efficient) ways of *doing things* in production and all areas of life for the benefit of society.

This has also been a 'hot' topic in European policy circles since the formation of the Advisory Group (AG) to the Information Society Technologies (IST) agenda in preparation for the 6th Framework Programme (ISTAG, 1999, 2000, 2001). Over time it became evident that the SSH disciplines should be brought to the table, and innovation policy has been shifting towards integrated and interdisciplinary solutions to societal problems, however, positioning advanced ICTs in a pivotal role (European Commission, 2010a, 2010b, 2011). More recently, an agenda of Responsible Research and Innovation (RRI) has taken shape with the aim to improve upon the culture of accountability in scientific and technological development (European Commission, 2012), and the RRI agenda and SSH disciplines are now embedded in ICT-related parts of the Horizon2020 work programme (European Commission, 2015).

One question to ask then is what exactly these agendas and programmes aim for in terms of societal development, who truly benefits and how? Are there any counter discourses to consider, of articulating and arguing *some other* innovative and societally beneficial ways of *doing things* for a better society? It is an objective of CANDID to deconstruct 'smart' by delving into particular innovation domains and developments. What WP5 contributes to this process is to take a step further in fleshing out and making available the rhetorical and argumentative instruments at work in the discourse of smart, and thereby contribute to one of CANDID's key objectives which is to suggest new pathways to communication between policy, SSH and ICT.

2.1 Communications of the case studies and WP5

The insights discussed in this report draw on four types of texts/discourses: the communication texts written, disseminated and responded to as part of the CANDID case studies; the interviews that followed these communications; the policy and policy-related documents analysed as part of WP5; and the interviews following up on that analysis.

The study on *User and Design Configurations* delivered a total of 46 communications with peers (written and oral). The study on *Risks, Rights and Engineering* delivered 24 communications and the study on *Sensing Infrastructures* delivered 40. It should be noted that in checking our own assumptions (within CANDID), the communication texts and interview schedules were extensively discussed, while reflecting on the communications and on the constructs and assumptions identified in them. In this internal process, the CANDID partners were encouraged to clarify their choices in framing and conceptualising the communication texts, as well as decisions on the format of the peer engagement (survey-type, interview, written communication, etc.).

At this time, WP5 has three interviews available and three more pending. The interviews follow an analysis of EC policy documents (N=8), including 2016-2017 work programmes and communications documents (SWAFS and European Research Infrastructures), documents related to RRI (N=3), and minutes, recommendations and position papers (most notably those of CAF, N=13). We note the influence of the academic community (mainly STS scholarship) in Commission texts on RRI (see Owen et al., 2013), and this literature has become a focus in WP5 work, although, not included in the analysis prepared for this report. These academic contributions and the academic jargon will remain a challenge for us to address in the future.

We have taken into account the contexts in which the policy-related documents are physically embedded, interacted with and how they function as tangible, normative and regulatory resources (see European Commission, 2008) on 'the digital world' and 'innovation', for example, in reference to the Digital Single Market (DSM) and Innovation Union web pages. The rationale for focusing on policy documents, those of the European Commission in particular, centres on their role, not only as key in framing the approach to smart developments, including the ways in which notions of smart are constituted, but also and, by implication, in affording access to different actors and in managing agentive power. This approach is grounded in the view that discourse is performative (Austin, 1962), constituting and constitutive of reality (see *inter alia,* Callon 2007), but it also reflects our own framing of EC policy document discourse as normative, although, we have treated these documents as only one part of the assemblages that make up the discourse of smart (Latour, 2005).

While documents and other media seem to have critical agency, other critical actors in these assemblages are the policy-makers and the practitioners interacting with them in constructions of what smart stands for. We opted for interviews with EC officials and advisors as well as user group representatives interacting with the Commission on issues such as RRI, also drawing on extracts from policy documents to prompt our discussions with our correspondents. While interactions are not confined to these actors, but also include other peers such as for example the ones approached in the three case studies, the remit of WP5 concerns the ways in which smart, RRI, interdisciplinarity and agency are constructed and constituted in and through policy discourse. For this purpose, this report focuses on discourse codification drawing on all of the above: materials from the CANDID case studies, from policy and policy-related documents and interviews.

The analysis in this report is principled upon the discursive turn in social psychology, including discursive psychology (Edwards and Potter, 1992), rhetorical psychology (Billig,

1991) and critical discursive social psychology (Wetherell, 1998). It enables us to focus on regularities in discourse and in the lines of argumentation that are mobilised in terms of content, common place (Billig, 1991) and dilemmas (Billig et al., 1988) around which the arguments develop as well as the discursive strategies used to formulate them (Edwards and Potter, 1992). We pay attention to the ways in which participants orient to issues and position themselves, considering both local and macro-social implications. There are also significant insights to gain by considering speakers' identities and paying attention to the footing (Goffman, 1981) from which certain arguments are formulated, the stakes and the accountability management that goes on (Edwards and Potter, 1992).

3. Discourse-analytic insights on smart

This section demonstrates how discourse analysis can contribute to broader analyses of smart technologies, systems and associated developments. We discuss extracts from interviews and texts that are selected here on the basis of what the CANDID partners have identified as key themes emerging in the peer communications: *shared concerns* and *constructions*, *conspicuous phenomena* and *issues that cut across* the cases and the work of WP5. The extracts are, therefore, presented thematically rather than broken down by the internal work units of CANDID. It should be reiterated here that this report is not intended to be an exhaustive discourse-analytic account; rather, it is intended as the building blocks to a guide for those interested in the ways in which DA approaches discourse in general and discourse of smart in particular.

The sections to follow consist of examples of 'talk' in reference to three central themes:

3.1 *constructions of smart*,

3.2 the ways in which *interactions between disciplines and knowledge regimes* are talked about, and

3.3 *who is included and excluded* in (and from) this discourse and in the constructions of the presumed addressees of smart developments.

The analytic focus on these themes is emergent but also guided by the critical approach of deconstruction already employed by our CANDID partners. The themes are interrelated in the discourse of smart but heuristically broken down here for the purpose of analysis.

3.1. Constructions of smart

The first set of extracts has been selected as examples of the ways in which smart is constructed. The innovation trajectory is inevitable, technology is centre stage, although, human input and user roles also form a part of these constructions. The meanings attached to certain notions and terms however, indicate some ambiguity about the ontological status of smart phenomena, but the argument goes unchallenged that smart developments, like all new innovations, should to be properly embedded in society for acceptability and uptake.

In looking at the "*Prospects for technology assessment in a framework of responsible research and innovation*", von Schomberg (2011a) defines RRI as,

"[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 (in order to allow a proper embedding of scientific and technological advances in our society)."

While the construction of 'responsibility' in this definition makes claims to accountability and mutual responsiveness between innovation and society, there is no questioning of the framing of the purpose of the RRI agenda, i.e., to "allow a proper embedding of scientific and technological advances in our society". There is no suggestion, for example, to allow a proper embedding of society or social-cultural practice in scientific and technological advances. Innovation as such appears to be self-driving, self-nascent and inevitable in its scientific and technological manifestations and problem domains. Similarly, we observe how smart refers to self-driving and self-nascent entities, objects or qualifiers equipping objects with certain properties that are on an inevitable course.

Extract 1 (European Commission 2012, communications about future network technologies)

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[… N]eeds for networking will increase drastically in coming few years
(number of connected objects, higher data rate, pervasive access to
information from users, delinearised content, cloud computing etc.).
[…] In times of demographic change, increasing health care costs and
shrinking resources, innovative ICT solutions become more and more
vital to ensure high quality of life and future health care.[…]
combining information from smart home and smart city environment
(sensor networks, home management systems) […] ICT networks will be
the control and transport plane of National Critical Infrastructures
such as; health and telecare systems, eGovernment, transport systems,
energy systems and environmental monitoring systems.
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For discourse-analytic purposes, drawing on von Schomberg's definition enables us to formulate an 'argument by analogy' (see McKinlay and McVittie, 2008), to say that what applies there is assimilated in constructions of smart. Smart is commonly constructed as responsive and accountable to societal needs and challenges, analogous to the RRI agenda, and they are developments on a self-evident course as scientific and technological trajectories. The pivotal role of advanced ICTs and smart solutions – their self-driving – seems inevitable, although, to paraphrase von Schomberg, the solutions need proper embedding in society.

Extract 2 is a manifestation of a similar orientation to smart, but focusing on accounting for the notion of smart and the use of the term. It comes from an interview with a DG official in response to a question inviting the interviewee to discuss the notion of smart.

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Er, I cannot give examples of smart technologies I have been involved,
er, have been involved with exactly but I can tell you when it's the
first time I recall the use of the word 'smart' which is, umm, the,
er, mid '90s thereabout, er, in the area of, umm, er...  When the
micromechanics started to be and other, and other little objects
started to be integrated with electronics therefore acquiring some
kind of intelligence, even if primitive. Er, people, er, started
talking about 'systems', 'microsystems', and smart... and then 'smart
systems'.  So, umm, the... at the time in the US, er, the micr...
what was called 'microsystems' in Europe, they were called 'MEMS' or
'micro electro mechanical systems' which is a more... far more
technical word, er, technical, er, term in the US.  So in Europe, umm,
I remember discussions with people saying, "Why don't we call them
'smart systems'?"  It is, er, elegant, the word 'smart' is very short,
umm, and it is... it betrays the existence of some kind of
intelligence which comes of course by the electronics that are being
integrated.(EC-DG Official)
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The official orients to smart by tracing the early trajectory of the notion and use of the word, following a disclaimer that s/he cannot talk about specific smart technologies due to lack of direct involvement in their making. S/he provides an anecdotal account of this trajectory claiming category entitlement (see Edwards and Potter, 1992 on being able from authority/position), insofar as s/he treats the recollection as sufficient (re)source. In this account, the technology is centre stage, objectified and depoliticised while the role of human agency is confined to stylistic interventions understood to be evidenced in the technological developments themselves. The technology is treated as an agent – "micromechanics started to be and other, and other little objects started to be integrated with electronics therefore acquiring some kind of intelligence". In this story, human agency seems to pick up only after technological developments are already on course, it being confined to the naming of this

development. The naming is then presented as primarily done on stylistic and branding criteria, yet in a second instance of articulation the term 'smart' is revealing the inherent embedded meaning – "betrays the existence of some kind of intelligence". Simultaneously, smart is constructed as the result of a naming process taken up by *some (abstracted) people* to describe emerging technological developments, while the term itself is seen as an inadequate descriptor on technological grounds. "[A] more… far more technical word" was already available.

While the two extracts we have discussed so far seem to hold 'regular'[1] orientations to smart, we also identified less regular orientations. An EC document tilted "Responsible Research and Innovation (RRI) and Social Sciences and Humanities (SSH) in ICT-related parts of H2020 Work Programme 16-17", scripts research and innovation in the "7-million LEIT-ICT topic" in "calling for two types of actions":

"First, it calls for research and innovation actions addressing societal issues of relevance for H2020-funded ICT-related activities".

"Secondly, this topic calls for research and innovations actions of a different kind, the so-called *sister projects*", then the document goes on to say that,

"[i]n a sister project, RRI-SSH experts are invited to challenge the way research and innovation is normally approached in the area, exchange views and ideas with technology scientists and engineers working in this area, and propose constructive alternative framings for the research. Unveiling the biases embedded in the call text, challenging them and trying out alternatives will foster innovation through the widening of imaginaries".

Extract 3 is a footnote to this last sentence in the document:

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For example, call texts make heavy use of the words "intelligence" and
"smart": this relies on underlying assumptions about what is expected
from  technology,  and  about  representations  of  the  human-machine
interface and of the humans themselves.
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Footnotes function to provide supplementary or explanatory information to a main text, although, not treated as a critical part of the main text, i.e. the main text can potentially do without the footnote. This is interesting here as the footnote attempts a qualification of the "biases embedded in the call text" through the use of an example, signalling it as such – "for example". This example of a bias consists of a "heavy use" of "intelligence" and "smart" on assumptions that are not shared during this use. In other words, the footnote suggests that underlying assumptions in the use of these words are not outspoken, while also that an extensive use of them is made in this format – as words with concealed assumptions. The concealed assumptions are then suggested in a three-part list (Jefferson, 1990) – "expectations from technology", "representations of human machine interface" "and of the humans themselves" – which functions in this line of argument to treat these issues as mundane (a list of what is to be expected). While, on the one hand, the use of a footnote, the strategy of an example, the use of colon (:) and the three-part list, function to construct the argument that smart is imbued with assumptions and should be deconstructed to unravel their mundane self-evidence, on the other hand, no such deconstruction is actually attempted in the document text. Rather, the text falls into the trap of calling for a deconstruction of concealed assumptions through the use of a format (footnote) and example containing the assumptions of the author(s) about this, namely that a need for a deconstruction of smart is self-evident to everyone (or at least to the addressees of the document in question). The extract is rich in

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1 We place the word 'regular' in quotation marks here to problematize the performative work of discourse-analytic terminology in reifying such attributions by naming and using them. Regular here refers to common, in the sense of being repetitively used, hence, conspicuous in discourse. We also resist treating less regular orientations as irregularities, avoiding to contribute to constituting them as such.

other respects as well, for example in referring to smart and intelligence as words, or indeed in who it considers the addressees, but that is beyond the scope of analysis in this report.

The final extract in this section comes from an interview with a representative of a user group who has been involved in a consultation exercise on RRI indicators. The exchange unfolds in response to a question inviting the speaker to discuss the notion of smart.

Extract 4

```
so for us as smar…, erm, technology would mean a technology that is
designed for all meaning that, erm, when in the development process of
that technology, erm, the designer, the developers, take into account,
erm, the, the human, the human diversity, let's say, so they follow
the universal design principles, erm, to make sure that the
technology's as accessible as possible for the greatest number of
people erm, without any further adaptation or erm, or erm, or
modification. (User group rep)
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The speaker starts with a position disclaimer – "for us". This functions both as a right to an entitlement of having an opinion (see Billig, 1987) but also as a way to dissociate us from *others*, potentially responding to something beyond the immediate discussion in the interview. This is further indicated by the use of "would" implying a desired, hypothetical rather than an actual state of affairs. In what follows, smart technology would be constructed as a technology "designed for all" (as opposed to only e.g., able-bodied adults), and then goes on to script the way this would be done. Therefore, the speaker orients to smart in terms of achieving genuine inclusiveness and having implied that this is desired, yet scripting how it could be done, implies that while it is doable, it is not done. This indicates a critique, further attested by the speaker attributing responsibility to developers to ensure inclusion in the early development stages (rather than designing technologies that need adaptations later).

This orientation to smart as inclusive, yet as a desired and not an actual case, doable but not done, acquires legitimacy as an argument in the interview, in reference to being a response to a discussion *elsewhere*, i.e., where the interviewee has been actively involved on behalf of a user group (see also section 3.3).

Summary

The insights we glean from looking at these extracts, centre on the ways in which smart developments are depicted and given an ontological status. We learn about definitions of technological objects and properties, about functions that can shift the agentive power back and forth between innovation and society, and onto humans, human-machine interaction, accountability and ways of doing things for the benefit of individuals and society. We also notice the predominance of uncontested bias that never really questions the centredness of technology in framing and promoting innovation, however well-founded the commitment might be to societal challenges.

How this is achieved is no less important to observe. For example, we observe analogous ways of qualifying perceived relations between sectors and disciplines, in stating the policy aims of innovation agendas and programmes that then appeal to their mutual responsiveness. Terms, like 'ensure' and 'vital' emphasise the urgency of innovation for quality of life. Branding reveals inherent and novel qualities. Arguments in interviews acquire legitimacy in signalling reference to discussions or debates *elsewhere*. Claims to supporting and helping humans further contributes to the normalisation of technology on the centre stage. Treating expectations and representations as mundane and banal, twists the attempt at deconstructing

key terms like 'smart' and 'intelligence' insofar as they become mundane and banal in and of themselves by way of format.

These observations of how notions of smart are constructed – definite and vague – help us become aware of the discursive instruments that afford their making, although, only in the ways in which we can exemplify with our examples. This is obviously not a complete account but we will come back to some of the consequences of the rhetoric and the argumentation in section 4.

3.2 Talking about Interdisciplinarity

A key topic in discourse of smart developments and projects, as well as in related EC policy documents, is the necessity of interaction between different disciplines and sectors. This is manifested in talk about the relationship between disciplines (e.g. SSH and ICT), between knowledge regimes and the actors that become relevant in talk about smart developments or explicitly as "interdisciplinarity" and "multidisciplinarity" (less as "crossdisciplinarity").

The first extract comes from a document titled "Information and Communication Technologies (ICT) in Horizon 2020: Recommendations of the CONNECT Advisory Forum (CAF) for ICT in work programmes 2014-15 of Horizon 2020" (2013). More specifically, it comes from a section titled "ICT Innovation in Horizon 2020: Recommendations of the CONNECT Advisory Forum (CAF)" which lists 11 recommendations, one of which (number 8) is Extract 5.

> **Extract 5** Recommendation 8   Multidisciplinarity is necessary
>
> Horizon 2020 should look to achieve the De Medici effect where disruptive breakthroughs occur at the intersections of disciplines and domains. Too often programs have been defined from a narrow technology-push perspective and are targeted at one specific academic discipline. Both within the technology domain it is crucial that sub-disciplines work together (e.g. computing and networking experts) but also across disciplines. The societal challenges that have been put forward by the H2020 program should be translated into more specific technology challenges (e.g robotic MD, Google glasses, self-driving vehicle, holographic presence) and tackling these challenges requires a multidisciplinary approach. This includes legal and regulatory aspects. This can also be achieved by developing different instruments than the classical projects (support for fellowships, creative incubators, multidisciplinary research centres such as MIT Medialab.

"Multidisciplinarity" is constructed as a self-evident requirement to address "societal challenges". Horizon 2020 acquires its own agency and is assigned with a task. The task draws on an example, called "the Medici effect", as an argument by analogy; like the Medici family in Italy unintentionally contributed to the Renaissance, different disciplines are called upon to intersect in producing "disruptive breakthroughs". While "disruptive breakthroughs" may seem to entail a paradox in the former having a negative connotation and the latter a positive one, "disruption", is commonly used in innovation discourse to denote the transformative power new innovations can have on the value chain, in restructuring practices and markets and enabling new economies of scale (see Moedas, 2014a). It is used as a collocation in a line of argumentation that depicts interdisciplinarity and working across domains as a linear pathway and a promise of innovation as great achievements.

The account is embedded with certain assumptions from the very first lines, framing the message in specific ways: disruptive breakthroughs – innovations – are constructed as

desirable achievements and working across disciplines and domains is presented as the way to get there. The antipode of this is constructed as "narrow" and "technology-push(ed)", constructed in an impersonal way, using passive voice. This seems to respond to a common critique that technological developments may be detached from societal challenges and/or the input from other knowledge domains. However, neither the need for intersection nor the "societal challenges" that this need is grounded upon are articulated any further. Rather, in a self-referential mode, the document quotes another Commission documentation, "the H2020 program" (see European Commission, 2011), in support of the identification of these societal challenges that are not further explained, but an association is made between them and technological challenges, using examples of the latter, to make them more tangible to the reader. The argument then comes back full circle, calling for "a multidisciplinary approach" as a requirement.

Self-reference and circularity (see Lynch, M., 2010) is a common rhetorical move in this type of discourse and indeed shapes its normative function. This consists of supporting an argument by recourse to the self-same argument, often quoted circularly from one document to the other, produced by the same institution. In that way, the argument is both an argument and a resource. In addition to that, and common in this type of discourse, is that the societal and technological challenges and the relationship between them are articulated as objective realities *out there*, driving themselves while human agency is absent. This discursive strategy is rooted in empiricist discourse (see Gilbert and Mulkay, 1984), consisting of impersonal structures and functions to treat as factual what is being argued as well as the constructs within that argument.

In the next extract, the circularity we observe above, becomes a way of talking about interdisciplinarity for a member of an EC advisory group (AG). The extract evolves after the interviewer has problematized the relationship between different disciplines and different actors in smart developments. It is rhetorically framed as an issue by the interviewer.

Extract 6

```
R: Well without interdisciplinarity, we will not have any, any real
future and very good future, er, in these kinds of projects, so
interdisciplinarity is key, it's a key component.
I: Hmm hmm. Okay. Er, do you have, do you...?  I mean, some, some,
er, some say that, umm, often they find that it may be difficult to
talk to different disciplines and that may affect, er, the work, how,
how do you see that?
R: Yes, it's true.  It is true.  So it's why people like me can
sometimes bridge, umm...  So, er, so that's why I think that, er, at a
certain point, umm, umm, I was invited to, to, to be... well to be
part of, of ((name of AG)), because I, I, I could bridge among the
different scientific areas because it's very, very difficult for them,
for some from, er, er, er, artificial intelligence and, er, other
disciplines and to have a different look, umm, and to better
understand how important is interdisciplinarity. If we have nowadays
very good projects within Horizon that is the because of the
interdisciplinarity of these projects at day, day, day one and they
are... they have very good results because they cross these different
disciplines, er, that are so important to have better, er, er, better
projects umm, using ((the programme)). (Member of an EC advisory
group)
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Interdisciplinary is treated here as self-evidently benefiting the future. This is vaguely articulated (see Edwards and Potter, 1992), treated as banal and functions to factualise. In response to the interviewer's intervention on difficulties in inter-disciplinary communication, the speaker shifts footing to talk about their role as one of "bridging" these differences. However, the way this bridging takes place is not articulated further, rather, the argument

comes full circle: praising interdisciplinarity for being "important", the ingredient of "good projects", which, by consequence, will produce "good results", that are themselves "important" for having "better projects", so on and so forth.

The next extract comes from a discussion with a DG officer and evolves after the interviewer has problematized, as in the extract above, the relationship between different disciplines and different actors in the development of smart technologies. The speaker seems to orient to the issue in terms of a dilemma pertaining to interdisciplinarity as good in principle, yet problematic in practice.

Extract 7

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the current scientific system does not favour this communication.  For
example, umm, truly interdisciplinary academic work has a hard time
being published - because it does not belong to one journal, er, but
nearer to the other - if it is truly interdisciplinary. An evaluation
community in a certain, I don't know, er, council, in one of the UK
councils, if it is truly interdisciplinary it will have a hard time to
find a home, and usually if it is evaluated by interdisciplinary... I
mean, I say this axiomatically, I don't... I cannot, er...  But if it
is evaluated by a truly interdisciplinary panel of evaluators, if it
is a funding proposal, it is likely to have a much harder time get
through than if it is, er, a mono-disciplinary one because the, umm,
er... because the  different  disciplines  understand  and  think
differently and therefore they're far more likely ((on)) a specific
proposal to come to disagreement. So, er, it... it doesn't favour at
all interdisci... On the other hand, this is where all the novel ideas
come from, er, from inter... from, er, you know, 'thinking outside the
box', as they say, or from thinking across disciplines and so on, from
lateral thinking, all these terms. (EC DG Official)
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The officer orients to the issue in terms of "the current scientific system". S/he uses journal publication and project evaluation criteria as examples in support of this line of argument, while disclaiming authority – it is an axiom rather than based on experience or evidence. Different disciplines are constructed as "understanding and thinking differently", which is treated as normal. In a formulation of an argument that is balanced in taking all (two) sides into account, the speaker moves on to present the 'other' side. This move seems to be resourced by a discussion *elsewhere*, not in the immediate interaction of the interview. The 'other' side becomes evident in the use of commonplace phrases in talking about interdisciplinarity which are presented in a list form as mundane, such as "thinking outside the box", "thinking across disciplines", "from lateral thinking", "all these terms", and in seeking corroboration from others – "as they say".

Overall, the policy officer orients to interdisciplinarity by constructing a balanced account of the place from where novelty comes *in principle*, however, has a hard time being appreciated *in practice*. S/he does so from a distant position. Through this positioning and the use of a strategy of the balanced argument, the s/he comes across as rational and not invested, while reproducing interdisciplinarity as criterion for innovation. 'In principle' and 'in practice' type of arguments also function to inoculate speakers from being accused of blindness while also rhetorically sanctioning idleness – being able to 'see' the issue mitigates responsibility for action (and non-action).

The next extract is an exemple of yet another way of talking about interdisciplinarity, which still invites an 'in principle' and 'in practice' type of argument. It comes from a discussion with a representative of a user group. Similarly to extracts 6 and 7 above, it evolves after the interviewer has problematized the relationship between different disciplines and actors and the rhetorical framing of interdisciplinarity is also the issue that applies here.

Extract 8

```
they tend to work in silos. I mean, erm, [.] there are some, of
course, there are some collaborations in some, erm, aspects I would
say but, erm, in general what erm, what we feel is that users
organisation are really detached from academia, industry, I mean, of
course, if you are a small NGO representing users, consumers,
whatever, erm, person with disabilities you are usually usually under-
funded first of all so you don't have too much, erm, human power or
resources to, to be everywhere and of course, you need to prioritise
and, and, and, and, and I would think that the first actor you need to
engage with is the policymakers then it's, it's where you can actually
make a, make some, some changes, erm, and achieve some, some, some
improvements, erm by law and by regulation and some national or
European international level. (User group rep)
```

The speaker uses the term 'silos' to describe the way different actors work on smart developments as an issue in principle. That is followed by an apparent concession disclaiming accusations that this may be amenable to a generalisation. The reference to silos and exclusion seems to continue the argument "that user organisations are really detached from academia". It invites yet another disclaimer articulated as 'in practice' type of argument": the (small) involvement of NGOs with academia is grounded upon the (lack of) human and monetary resources. The argument is based upon reasons constructed as pragmatic which enables a follow-up argument about actions guided by pragmatic reasons, namely, that in the absence of resources, engaging with policy makers is a priority. In this way, the speaker deflects accusations of inaction on the part of NGOs while arguing that working across different fields (or the lack thereof) is an issue. This is done by way of distancing, indicating that a collective (not the speaker alone) is dealing with these circumstances, i.e., by employing a second person footing – "you".

The next extract comes from a written exchange with a peer involved in the CANDID study on *Risks, Rights and Engineering.* The exchange unfolds in response to a two-part question: "What are typical problems in Data Protection Impact Assessment procedures? How do you solve them?" It is analysed here for presenting an orientation interdisciplinarity that is not provoked explicitly by the question.

Extract 9

```
One of the main challenges is interdisciplinary cooperation, as this
requires  an  authentic  willingness  for  close  collaboration,
participants that are open to (the value of) views from other
disciplines and terms that are understandable by all parties being
involved. E.g. media scholars understanding technical affordances,
engineers willing to see beyond technology, lawyers grasping social
behaviour etc. Possible ways to solve these can be found in guidelines
on how to do successful interdisciplinary work, e.g. by using boundary
concepts, by using participatory tools (like tech cards), etc.
(Peer involved in interaction design)
```

The peer orients to the question above by drawing on "interdisciplinary cooperation", therefore orienting to it 'in practice' (Potter and Litton, 1985) and not because of being prompted to do so. S/he formulates an argument that questions the intentions of interdisciplinary cooperation, implying that the willingness for close collaboration is not genuine. Therefore, rather than arguing that interdisciplinarity is missing (but required as stated in extract 5 above), true willingness and openness are questioned and only later the issue of communication – "terms that are understandable by all parties". Examples are provided in support of this argument. S/he then offers a solution (*as the question invites; this is more straightforwardly done in written exchanges as people can go back and re-read what*

is expected of them). The solution consists of a guide, and implies that while interdisciplinarity is good in principle, it is not synonymous to success, as previous extracts construe. Rather, there seems to be successful and, by implication, not successful interdisciplinary work.

This account is somewhat askew with the normative discourse of the inherent good of *breaking down the silos*, as it is commonly put (see Moedas, 2014b). Interdisciplinarity is not treated as a given resource – a given ingredient of success – but as a goal that requires further qualification in order to be successful. It suggests that interdisciplinarity is an outcome of deliberate efforts and willingness, and should not be positioned as a prerequisite to integrated projects and programmes, which is in line with recent findings and policy recommendations on the matter (see Gunnarsdóttir and van Dijk, 2015).

Summary

The insights we gain here centre on definitions, functions and problems with interdisciplinary and cross-sector interaction. We learn about its necessity as a self-evident good that can bring about disruptive breakthroughs and, consequently, reconfigure markets and practices. Interdisciplinarity is the way to great achievements and defined in terms of 'lateral thinking' and 'thinking outside the box', as opposed to the deficit in such thinking in 'silos'. We also learn that working across disciplines and sectors is ideal *in principle*, but problematic *in practice*. NGOs may be detached from academe and SSH scholars from ICT researchers and practitioners. Traditional publication and funding practices are an obstacle to interdisciplinarity. Epistemic incompatibilities in practice may require mediation to build bridges, and the intentions of interdisciplinary co-operation may not be entirely clear, nor the willingness to engage genuine. Nevertheless, interdiscipinarity is posed as a requirement in research agendas and funding programmes supporting smart developments – the essential ingredient in good projects and good results.

We become aware of how this is achieved in and through a number of strategies. Argument by analogy serves here to locate an origin and essence (Renaissance science) to interdisciplinarity. Self-reference and circularity in the policy literature, reveals how misleading quotations can be. Here, they seem to substantiate the argument for interdisciplinarity as a requirement, while treating the same argument elsewhere as the resource for making the argument in the first place. Casting doubt on the dominant discourse by bringing new assumptions to the discussion, re-frames interdisciplinarity as an *outcome* of deliberate effort and willingness, if successful at all. Arguments in interviews require legitimacy by resourcing discussions *elsewhere*, and if interdisciplinarity is problematic, then *seeing the problem* is used to rhetorically manage accountability and so is *deflection by distancing*, for example, that 'you' or 'they' could take pragmatic steps.

Observing these strategies at work helps us understand how interactions between disciplines and sectors are talked about in reference to accountability, management and investment in (funding of) smart developments. We will come back to the consequences of these arguments in section 4.

3.3 Inclusion, exclusion and constructing the addressees of smart developments

This subsection looks at the ways in which the discourse of smart can include and exclude different groups of people. This may manifest itself explicitly by talking about inclusion or exclusion 'in theory'. It may be an orientation 'in practice' (see Potter and Litton, 1985 on the distinction between 'in theory' and 'in practice'), or a consequence of specific constructions in the discourse. The subsection is divided into two parts: 3.3.1 focuses on those who are made relevant and how their roles are constructed in talking about smart developments; 3.3.2 focuses on the manner in which Europe and its citizens are constructed in common ways of addressing the beneficiaries of smart developments. These ways of addressing beneficiaries are then problematized in interview settings (3.3.2).

3.3.1 *Engagement – what roles are afforded for different actors?*

The first extract represents a common way of addressing people in relation to the internet. It comes from the DSM Open and Participative Innovation webpage (see figure below), available at
https://ec.europa.eu/digital-single-market/en/open-and-participative-innovation.

Extract 10

We all are innovators!

A co-creative process with excellent innovation capability includes connectivity of people in their roles within the community, multidisciplinary and multimaturity of disciplines and open environments for innovation (Living Labs). Users, with different knowledge, skills, experiences, roles, points of view and needs, can all contribute positively to the innovation process.

Internet Users: the New Innovators

The Internet enables people to take the floor, open debates and put together new ideas. People want to make the most of this opportunity and they are becoming more active, expressing themselves and interacting with others worldwide.

Better services: better life

Current users are better prepared technically and intellectually thanks to the constant use of advanced technologies and all the information they have available in the internet. As services' consumers, users know their needs as well as the deficiencies or limits

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The titles of the second and third paragraphs of the text in the image, "We are all innovators!", appear in bold, some first letters are capitalized and colons are used, all of which are typical of the genre of featuring text. It aims to attract attention and convey short and concise messages. People are addressed here as "Internet Users" with a secondary explanation of that category as "the New Innovators".

This first subheading foregrounds an account that takes internet use for granted, creating an anticipation about the following text as to what the heading makes relevant: a link between internet users and innovation. The text that follows then starts with a shift in footing, whereby the Internet becomes the acting subject. Using a categorical modality (Fairclough, 2003) and a three-part list to construct internet features as common place, the Internet is an enabler, endowing people with active agency (cf. Lynch, 2016). Footing then shifts to (speak for) people, who are categorically constructed as responsive to functions presented in a three-part list, again as common place: "active, expressing themselves and interacting with others worldwide." These mundane and common place opportunities are awaiting out-there as unquestionable truths about the role of the internet and people's wants.

The following subheading then signals that "[b]etter services" mean "better life". The subject shifts to "current users" who are categorically constructed as "better prepared", the gratitude for this attributed to the "use of advanced technologies" and the "information" "available in the internet". The text does a few things here through presences and absences. First, people are positioned as users, which seems to be a taken for granted category as the absence of further qualification indicates. Secondly, they are constructed as better prepared and equipped, begging the questions 'compared to when/what?' and 'for what?'. These are the banal functions of technology and the internet. Using extreme case formulations (Pomeratnz, 1986) users are portrayed as "constant[ly]" engaging and having "all the information" "available" to them - strategies that function to make a point come across stronger – to "legitimize claims" according to Pomerantz (1986). In so doing, "advanced technologies" is a collocation, treating and constituting recourse to technologies as banal, and so is information availability in the internet. Most importantly this formulation is based on assumptions of users as savvy, able to access, understand and use advanced technologies, and able to access, use and navigate the internet. The next sentence explicitly argues this, constructing users in market terms as "services' consumers", as rational and calculative actors, with complete control of themselves, presented again in a three-part list – knowing "their needs as well as the deficiencies or limits". In so doing, not only are affordability, capability and accessibility taken for granted. The function of the internet is too. It improves lives but, also, responsibility is managed by loading it onto the individual (people users).

While both of these sections of text are very rich in terms of constructions and assumptions, the implications we wish to stress as part of this section are: (i) the vision of savvy, rational, calculative people being treated as normal, (ii) non-savvy, rational, calculative people are excluded from this vision (and from normality), (iii) and even for those constructed as normal, active agency is confined to their responsiveness to these advanced technologies.

We should note at this point that this line of argumentation – constructing technology as enabling – has been common among ICT peers in the CANDID communications.

The next extract comes from a written exchange with a peer in the social sciences, participating in the study on *Sensing Infrastructures*. The extract is a written response to a two-part question that reads, "[i]n what sense do you think sensing infrastructures might enable or rather disable citizens' participation and collective responses to public issues? Any example to share?".

The way the question is framed has certain rhetorical consequences: it problematizes "participation", implying that there might be an issue with what "sensing infrastructures" "enable or *rather* disable". At the same, the word 'citizen' is used as a category implicated and affected by these infrastructures, taking citizenship as a given status. Having said that, respondents could pick upon these assumptions or not; however, these assumptions were not challenged in the written exchanges (cf. one interview).

Extract 11

```
Open data can provide citizens with information about their city that
enables them to participate in the democratic process more fully (e.g.
air quality maps allow informed participation in transport policy). At
the same time, sensing might reduce the space for participation
whenever decisions are taken based on available data -- while
introducing biases and assumptions.
(Peer from SSH)
```

This peer produces an account structured on two sides, indicated by casting sensing infrastructures as both enabling and disabling participation. S/he orients to sensing infrastructures in terms of"open data" and formulates an argument of open data as agents: providers of information, and by consequence, enablers of participation. "Citizens" are constructed as recipients of open data, while their role in being the data producers in the first place is absent in the account. Nevertheless, on the grounds of these qualities attributed to open data, the peer argues that participation is enhanced. S/he then moves to present what appears as the other side, open data restricting participation. This is scripted in introducing the other side with "at the same time".

Again the subject of the argument is other than people, in this case "sensing". Contrary to the categorical construction used in the argument of open data as enablers of participation, here the argument is mitigated – "sensing *might* reduce the space for participation", and that is "*whenever* decisions are taken based on *available* data". So, participation is constructed as a conditional possibility, potentially reduced by certain conditions. As the argument is structured using impersonal structures, it remains vague who the agents of decision-making are and whose "biases and assumptions" may be introduced. The account comes across as taking different sides into account, endowing the peer with the identity of an objective, knowledgeable person, able to see and consider different sides of the issue as a matter of observation rather than personal view. This was somewhat expected as the study positioned peers as experts on the basis of their professional profiles. The first reading of this, therefore, is that it constitutes an informed account with regards to inclusion potentials and exclusion possibilities, empowerment and disempowerment with regards to the role of infrastructures in citizen participation in governance. A closer reading, however, indicates that in this account (i) the citizen is assumed to take a back seat, positioned at the receiving end, and (ii) while the enabling qualities are constructed as given, disabling participation is constructed as a possibility. As regards the speaker, s/he manages to articulate an informed position while not committing to a definitive response, also common in academic discourse as presenting and 'objective gaze' (see Latour, 2000; Haraway, 1988; Boltanski and Thevenot, 2006) which then relays responsibility to others.

In the next extract, a somewhat different orientation to participation is manifested. The extract comes from a discussion with a user group representative and develops in discussing the notion of hyperconnectivity drawn from EC policy documentation (see for example European Commission, 2015). The speaker was prompted to consider the reference to hyperconnectivity – "in the era of hyperconnectivity", "we are all hyper connected" – made in these documents.

Extract 12

```
as long as, erm, as long as people have the right to, not to be
connected or, erm, to decide whether to be connected or not and
whether everybody has the possibility to be connected because, I mean,
this is not only an issue about connectivity, it's also an issue about
affordability of that connection and the accessibility of that
connection so, erm, for us, erm, internet of things won't make a
change or improvement in our life if this is not acceptable or if the
technology is too expensive to buy so, erm, the, erm, there are also,
```

```
it's not only the connectivity aspect that we care about it's also the
affordability, it's also the accessibility of it. (User group rep)
```

The speaker responds with a conditional account in response to the issue of hyperconnectivity, made up of a three-part list constructing connectivity in terms of a right and possibility. The first two parts – "the right not to be connected", "the right to decide whether to be connected or not" – foreground an emphasis on exclusion and includion by choice as a right. The emphasis is attributed by use of repetition, rewording people's right to decide their own fate. In the first instance, the response treats people as rights' holders and entails the assumption that people are aware of their rights and can act upon that awareness. The third part of the list then shifts the orientation to hyperconnectivity as a matter of individual right to a matter of indiscriminate possibility – "everybody" having "the possibility to be connected". S/he then goes on to explain this affirmatively, by the use of "I mean".

The explanatory account consists of affordability and accessibility as key concerns for the speaker and the group s/he represents – "for *us*", "what *we care* about". Thus, apart from shifting the orientation from a right to an indiscriminate possibility, the shift is also from individual, to relevant groups to people in general. For example, the speaker orients to affordability and accessibility as a user group representative, yet aligning with people at large – "our life". These shifts in footing indicate the ways in which voices are entangled in this kind of rhetoric and of the stakes made relevant in this talk – coming across as someone who is a group representative and group oriented (van Knippenberg and Hogg, 2003). From this mixed footing, the speaker argues that IoT "won't make a change or improvement" unless it is "acceptable" and affordable. S/he has deconstructed hyperconnectivity and questioned its built-in assumptions, while IoT is simply a matter of change and improvement potential.

The next extract comes from an interview with a peer from a users movement participating in the study on *Risks, Rights and Engineering.* The extract unfolds after the interviewer has made a distinction between safeguarding rights and (other) "concrete problems" related to these "processes", such as "financial". The extract engages with the question 'in theory' and then moves on to produce what seems to be an 'in practice' account.
(see Potter and Litton, 1985).

Extract 13


```
Right now personally, my thinking is, as in my private opinion, not my
professional one, in that sense that I am meant to be going out there
and announcing it is that I'm waiting for some kind of different level
of technology. Something else, I don't know. Blog was all those years
ago. Something that enhances the power of the individual to be able to
do things. I don't know what it is. It could be someone building
useful and good algorithms for individuals, I don't know. Then that
punctuality may bring about a different swing in the spiral, the
upward spiral hopefully. I don't know what that could be. Maybe
something to do with maybe something to do with sensors, maybe some
sort of strange data analysis that is not complicated and somehow
moves us to the different level that allows individuals who are not
trained data scientists to understand data. Maybe some kind of
visualisation, maybe some way of representing data that somehow brings
it closer to everyone. I don't know, but that's what I'm hoping.
```

The extract starts with a disclaimer on the part of the peer that they are speaking from a personal rather than professional opinion (see Gilbert and Mulkay, 1984, on contingency discourse). This then enables an account based on aspiration, disclaiming any commitment to knowledge or certainty – "waiting for", "I don't know", "Maybe", "hoping" – and it

inoculates the speaker from having to provide answers or solutions. In this account the peer calls for a technological revolution in the service of individuals. In so doing, the human agent in this call for technological revolution is vague – "someone"; individuals are constructed as recipients, assuming that their ability "to do things" will be "enhance[d]". While allowances are made for including "individuals who are not trained data scientists", and for the possibility that this "may" and, by consequence, may not "bring about" "the upward swing" "in the spiral", the account still reproduces passive agency for individuals, and their desire for technology advancement as the key to better futures.

3.3.2 For whom is all this 'meant'? Constructing Europe and (European) citizens

Extract 14 comes from the introduction of an EC communication (COM) document titled: "A Digital Agenda for Europe", published in 2010. The extract appears on page 3 of the document and makes up the first paragraph of the introduction. The extract is presented in this section to frame the scene with regards to the digital agenda for Europe.

Extract 14

```
INTRODUCTION
The overall aim of the Digital Agenda is to deliver sustainable
economic and social benefits from a digital single market based on
fast and ultra fast internet and interoperable applications.
The crisis has wiped out years of economic and social progress and
exposed structural weaknesses in Europe's economy. Europe's primary
goal today must be to get Europe back on track. To achieve a
sustainable future, it must already look beyond the short term. Faced
with demographic ageing and global competition we have three options:
work harder, work longer or work smarter. We will probably have to do
all three, but the third option is the only way to guarantee
increasing standards of life for Europeans. To achieve this, the
Digital Agenda makes proposals for actions that need to be taken
urgently to get Europe on track for smart, sustainable and inclusive
growth. Its proposals will set the scene for the longer-term
transformations that the increasingly digital economy and society will
bring about.
```

The extract is the first paragraph one encounters in reading this publicly available document. It starts by setting the scene, constructing "the Digital Agenda" as an actor with agency and "aim". The aim suggests that "a digital single market" will produce "sustainable economic and social benefits". As this is amenable to the question, "why" "is that required"?, the follow up sentence indicates some awareness that the previous claim requires legitimation. This is evident in how the next few sentences function as parentheses, providing background information in support of the need for sustainable economic and social benefits such as the digital agenda aims to deliver. This background consists of categorical constructions of Europe in "crisis" and of setting Europe off and back on "track". In these formulations, Europe is also treated as an entity with agency and goals. The notion of Europe is casually employed as a common place category, its agentive power and properties in no need of further qualification.

The footing then shifts to "we", listing three tasks as a complete list of what has to be done. This shift may be relevant to the content of these tasks – "work harder, work longer or work smarter". Work requires human agency and the authors use the first person plural to align themselves in constructing the in-group. However, in the next sentence, our smarter way of working is categorically constructed as "the only way to guarantee increasing standards of living for Europeans". The formulation emphasises preoccupation with 'working smarter', using an extreme case formulation – "the only way" – and positions Europeans as the

addressees / beneficiaries of taking the course. This problematizes the membership of Europe, of "we" and of Europeans. Will some need to work harder for the rest? And, who are these Europeans?

Interestingly, 'working Europeans' are treated as unproblematic which becomes all the more evident as the footing shifts again in the next and final two sentences of the paragraph. It shifts back to the acting subject being "the Digital Agenda", introducing yet another beneficiary – "society". The argument comes full circle: the Digital Agenda has an aim, sanctioned by providing a gloomy picture of Europe, constructing a move forward in specific ways as inevitable, and blurring human agency in depicting this process. In so doing, the policy that is articulated is only accountable to what are constructed as challenges to vague categories of place, people and work, for the benefit of which the Digital Agenda claims to act.

The final two extracts problematize further the construction of the beneficiaries of smart developments as articulated in EC policy documents. Extract 15 comes from a discussion with a user group representative. It evolves in response to a question where the interviewer picks upon the words "European" and "citizen" present in EC document excerpts that were used to prompt the discussion. The interviewer is hinting that the framing of these terms might be in need of further explanation.

Extract 15

```
we are all citizens, erm, the only problems is about what level of
citizen, citizenship can we enjoy, I mean, erm, they may, they may not
know, for instance, that there are still many people with disabilities
in Europe that lack legal capacity for instance and, erm, those erm,
are considered inside the citizenship that they are referring to.  I
mean, this is a plan when, when referring to general terms and not,
erm, embracing, erm, a broader sense of citizenship maybe for them
citizenship is just the erm, regular, erm, western man in the, in his
30s erm, and that should it be the case, we are all citizens. So, I
don't know what to, I mean, what they, they mean by this part, I mean,
we're on a par with that citizen erm, term as long as that includes
everybody. (User group rep)
```

The speaker starts with a global formulation and an extreme case formulation – "we are all citizens", hinting to a 'but'" which then follows. While this is structured as an 'in principle' argument in order to make a point about an 'in practice' argument, it treats citizenship as a given status. This could be taken to exclude by consequence people who do not have such a status. The 'in practice' argument that follows is then foregrounded as a "problem" – or "the only problem", signalling a specific critique. The speaker problematizes the ways in which the notion of citizen is treated in EC documents, a problem consisting of what s/he terms "the level of citizenship" "we enjoy". S/he then uses (vague) examples of this, implying that some people may not be enjoying full citizenship rights. S/he mitigates the responsibility of those who use these constructions – the authors of EC policy documents / policy makers / technology developers (mentioned in other parts of the interview) – by introducing the examples as something that "they may not know". The speaker then goes back to orienting to particular connotations as a "problem", providing a hypothetical construction of what "they" assume to be a citizen which is articulated in a list of properties. – "regular", "western man", "in his 30s". This hypothetical construction of a normal person drawing on gender and age stereotyping, enables the speaker to allude to a critique without explicitly voicing it. Having done so, the utterance closes similarly to the way it started, by arguing the point that the term itself is not the issue/problem; rather than orienting to the level of citizenship, as in the beginning, the closing response orients to the membership of the category, drawing on the extremes of it – including "everyone".

Problematizing levels of membership makes up an argument for full citizenship rights for all. The speaker interacts with, criticises and qualifies a critique of the ways in which the term 'citizen' is used in EC documents, while the use of the term *per se* and its *specific* affordances unchallenged, e.g., the relationship it implies with a civic entity, what that is and how one is 'entitled'. While this type of discourse is reactive rather than defensive – a common way to interact with and challenge normative discourse – it is still not deconstructive.

Hinting at the need to pause and further explain the terms, 'European' and 'citizen', is not necessarily picked up as an invitation to problematize or challenge them in any way (let alone articulating a reactive line about the terms of membership, and criticising stereotypical assumptions embedded in the ways in which they are employed in policy discourse). This is manifested in the final extract in this section which comes from a discussion with an EC advisory group member and evolves in response to the same question as the one prompting extract 15.

Extract 16

```
Well, […], I'm, I'm talking about the, the, the citizen that is, er,
is, er, is on the street and it it doesn't have ((itsy/DI/TCI?)), it
doesn't have any, any, any connection with, er, with, umm, with
research. ((could)) That the the other one, that is very connected
with, with research. But, but sometimes... but well it, er, is the
c... the case with, er, er, humanities and etc, that don't have to
use, er, these new technologies on their devices. On the other hand
they ((humanities and etc)) have to use them to make, er, better
research in a better way. So that's what we are talking about, social
literate scientists and, er, social science literate technologies. Er,
so, er, I am talking about all this range of citizens (.) because
nowadays I don't think that we can afford to have a society that, er,
er, er, doesn't understand what research is, is doing and what is
research for and it would be, umm, a major, umm, a major achievement
if, umm, if we can, er, change the, the, the current paradigm.
(Member of an EC advisory group)
```

The speaker responds to the question by initially drawing a distinction between two types of citizens: the one "on the street" – a popular metaphor for the 'everyday', 'common' person and "the other one that is very connected with research". While the first type draws on a common notion in democratic rhetoric – talking on behalf of the 'demos' – it constructs the everyday person as disconnected from research. To this type, the antipode is "the one that is very connected with research". This seems to make relevant for the speaker an argument about the use of the technologies s/he had been talking about (digital technologies) by SSH researchers. In this argument "have to" is used in two different ways; one to argue that SSH researchers *don't need* to use the "new technologies"; "on the other hand" that SSH researchers *must* use them.

This structure first indicates that while SSH people are very connected with research compared to the man on the street, they are still not 'savvy' enough, as indicated by the use of "[b]ut". Secondly, it constructs the use of "these new technologies" by SSH researchers as a requirement for "better research" and "better ways" of conducting it. Not only does s/he use a linear argument to align research method to research output. This way of talking is *also* embedded in assumptions that pertain to a hierarchy of epistemic communities. In so doing, further category work and a further distinction is implied, i.e., between SSH and a category of 'technologically savvy' researchers using the new technologies.

This is then explicitly articulated in the sentence that follows. "So" signals that the speaker is resuming the response to the interviewer, followed by a shift in footing from the first person singular – "I" – to plural – "we" – signalling that the notion of citizen s/he has been talking

about is a group-shared notion (possibly alluding to the advisory group / policy group of which s/he is positioned to speak as member). This change of hats serves an appeal to corroboration (Edwards and Potter, 1992), a distance and appeal to shared responsibility for the advocated argument, or an appeal to speaking as group representative, all common place strategies in managing accountability, especially when that is at 'stake'. Having done so, s/he concludes that "that's what we are talking about", as the goal category: "social literate scientists" and, "social science literate technologies".

After making these distinctions relevant in talking about the notion of citizen, s/he shifts footing again to claim authorship for grouping all of the above categories into "this range of citizens". The "range" implies inclusion, yet in the justification of this membership – the "range" – another term is made relevant – "society". Talking about a range of citizens is associated with society being able to "understand what research is, is doing and what is research for". In making this association, society is set apart at the receiving end of the research process.

In talking about the notion of citizen, "the man on the street" is presented as *inside* the citizen category, notwithstanding the assumption of a hierarchy in talking about the subcategories – lay person, SSH researcher and savvy researcher. In talking about progress, society is positioned *outside*. S/he implies that the current paradigm consists of a society that does not understand the content and purpose of research. In arguing so, the speaker positions him/herself in a category that "cannot afford" and seeks to "change" this "paradigm". The speaker stands apart from society, able to 'see' what the issue is with society and tasked with changing it, which is a common place way of talking in policy discourse. Society is constructed as a unitary entity and the task of 'educating' it is rendered inevitable in this line of argument. Importantly, the use of the word "afford" draws on economics and implies a parallel universe. "Society" is not only external to the universe that drives the future but also an impediment, holding that drive back as a result of not understanding.

On the face of it, this argumentation seems to be in contrast with the policy line taken in extract 10 above, according to which active engagement with technologies and the internet is assumed to be for everyone (yet positioning people on the receiving end, not as active agents in the making of these technologies). This is reminding of two kinds of talk. One is premised on epistemic hierarchies, for example, that *service* disciplines only fill in or make up for knowledge gaps in *master* disciplines (Barry et al, 2008; also Xenitidou and Elsenbroich, *in preparation* on ways of managing dogmatism in scientists' talk), with consequences for power relations in knowledge production. The other one echoes the policy discourse that blurs agency in talking about smart (see extract 14). As a rhetorical strategy, vagueness is a way of legitimating arguments, of constituting what is being argued as banal (see Edwards and Potter, 1992). or it is indicative of the assumptions the vagueness is grounded on. In policy discourse, vagueness and definitional looseness are instruments in the service of policy agendas (e.g., loose definitions of smart or intelligence). Employing vagueness rhetorically may also be indicative of dilemmas, requiring vagueness to manage tension, such as that between common knowledge and expertise (Billig et al, 1988). In this extract, vagueness is a normative way of talking to manage tension, while in other cases vagueness is (more) resourcefully used to manage accountability (see extract 2).

Summary

What we learn about inclusion / exclusion and beneficiaries from these excerpts, takes on a number of manifestations. People are linked to internet use as innovators in their own right –

the internet being the enabler of information gathering, expression and interaction – and the responsibility is with people to assume these affordances. Conversely, we learn that citizens are often implicated in designs as western males in their 30s, resulting in technologies and systems that are far from inclusive. Citizens can be empowered to take part in policy by using 'open data', while such data are disabling when they are acted upon in biased ways by decision-makers. There are both tech savvy and non-tech savvy citizens, the latter of which *must* use the new technologies, and there is a society that needs educating because 'we' cannot afford to hold back technological advances. We observe a key assumption here that using advanced technologies and accessing information *will* bring about better lives for citizens who are constructed as rational, calculative, responsive and responsible. The digital single market *will* produce sustainable benefits and take Europe out of a crisis, however, the argument is raised that being (dis)connected in a hyperconnected world should be a matter of right and possibility.

Again, we make note of how this is achieved. Claims acquire legitimacy in the use of extreme case formulations about the potential for *constant* engagement and having *all* the information. Referring to 'crisis' and being 'on and off track', justifies certain societal requirements and individual qualities (work harder) as the 'only way' forward, whereby *desirable* qualities of people become normative. Alluding to a hierarchy of disciplines and knowledge regimes, justifies the prominence (and leadership) of *master* disciplines. Using 'I mean' is an affirmative way of explaining, while vagueness becomes a rhetorical instruments to signal banality, construct normativity and serve particular agendas. Foregrounding stereotypical assumptions is used to strengthen critique and orient to 'others', while articulating two sides to a case performs knowledgeability, rather than personal stakes, and shifting from 'I' to a group, to people in general, illustrates the entanglement of voices that have stakes in an issue. Finally, 'I don't know', 'maybe' and similar expressions mitigate responsibility to suggest solutions.

In the next and final section we draw together the consequences of our findings.

4. Conclusion

We have stated our opinion that discourse-analytic methods are particularly effective at foregrounding the consequences of using certain rhetorical and argumentative resources. In this report, we have provided a taster of how this happens by making some of these resources available to the reader in our deconstruction of talk and text on these pages. In consultation with our CANDID partners, we agreed upon a criteria for choosing the discursive materials: they ought to focus on *shared concerns or constructions,* including *conspicuous phenomena* and *issues that cut across* the case studies and WP5.

The examples we take here are far from complete in accounting for available materials in terms of type and topic, and the range of strategies that are ordinary but effective in particular ways in reference to the subject matter at hand – the *smart new world*. Shared concerns and common constructs make claims about society, citizens, person qualities, and certain types of objects and properties, as we have seen. A key concern in these formulations centres on enacting rationality, responsiveness and responsibility to realise smart technologies and systems on terms that are analogous to, or built into, European innovation policy and investment programmes. Recourse to disciplinary structuring and knowledge domains centres on common concerns about working across disciplines and sectors. Interdisciplinarity is commonly endowed with an inherently positive meaning, being the inevitable ingredient for better (technological as societal) futures, on terms that tend to reinforce existing knowledge hierarchies and tensions in who holds the ultimate access to (better) knowledge. Alternative constructions and counter concerns appear to be shared within certain groups. A stakeholder group may resist common notions of citizens, the dominant vision of smart, orient to 'others' and care about the rights of individuals. Yet, reactive lines of argumentation, orienting to issues of inclusion and exclusion, re-produce constructions of people / society / citizens as recipients and of technology as a starting point and autonomous entity. Interdisciplinarity can also be treated as a goal rather than a given ingredient of success, yet, the key concerns there retain in principle the positive connotations of interdisciplinarity.

Among the most conspicuous phenomena, we foreground the vision of the inevitable good of scientific and technological advances to create a better society with better products and services, and the common positioning in formulations of people / society / citizens at the receiving end (the beneficiaries). These agencies remain conspicuously *frozen* in epistemic deficit, in spite of all the rhetoric of inclusion, empowerment and citizens being innovators in their own right. Spelling out technological objects and functions in talk and text, continuously supports the 'here'-ness and 'there'-ness of smart, even as phenomena in the future, and talk of interdisciplinarity and integration is conspicuous in reference to innovation practice in particular, apparently reinforced by being required now in work within the ICT development programme of Horizon2020.

Our findings on the subject matter at hand are neither, novel nor particularly surprising. Similar findings have resonated in STS scholarship and policy circles for years, some of which were built up on in a recent EU-funded project on integrated innovation assessment, EPINET (see http://epinet.no/content/epinet-project), in which CANDID partners were involved. The problem is rather that very similar findings crop up over and over again, in spite of – seemingly well-intentioned – efforts to improve upon the culture of accountability in innovation, in particular, in the ICT-related areas. Promoting open science, citizen science, science education, social-cultural innovation and interdiciplinary necessity, does not shift the paradigm of a European society that ultimately *must* accept and embed advances of particular sorts to be competitive in the 21st century (European Commission 2010a).[2]

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2 This key policy document has 26 mentions of competitive(ness) on 35 pages.

It is not our contention to argue bluntly or principally against the *smart new world* or to doubt the import of scientific and technological advances in bringing to life novel solutions to all kinds of problems, to refigure markets and practices and help create economies of scale. We do not doubt its role in sustaining competitiveness in specific domains. Rather, the issue at stake is persistent and deeply entrenched instrumentalisation of seemingly self-evident assumptions in a dominant discourse of smart: about society, individuals and groups, about agency and knowledge, and in the framing of societal challenges that can only be solved with scientific and technological advances. The consequences for ongoing (mis)communications across the SSH, ICT and policy domains begs the question if the European knowledge society is indeed taken seriously (see Felt, et al, 2007). So, what exactly does discourse-analytic approach to *innovation talk and text* add of value into the mix?

The issues we foreground in this report cut across the CANDID case studies: 1. *User and Design Configurations*, 2. *Risks, Rights and Engineering*, 3. *Sensing Infrastructures*; and WP5, *deconstructing the policy discourse*. The extracts were chosen on the basis of regularities we identified in the texts, more specifically, in the ways in which 'smart' is constructed, the ways in which (the role and relationship of) epistemic communities are formulated, and how the beneficiaries of smart are talked about. In paying due respect to the context of this discourse, we note that the discursive materials we actually use in this report, consist of three extracts from interactions with peers – two written exchanges and one interview – six extracts from EC policy texts and seven extracts from interviews with policy officers and peers who have or currently interact with EC policy development (advisory group member / user group representative).

As we have stated, this is a small sample of available materials, however, on the basis of which our method of analysing the discourse – on the premises of rhetorical and discursive psychology – enables a deconstructionist way of 'seeing' and, subsequently, of making visible the instruments of rhetoric and argumentation. We see indications that arguments by analogy and by example, listing, categorical talk, category entitlement, vagueness, apparent concessions, extreme case formulations as well as circularity are all common rhetorical strategies. They manage accountability and perform the powers of persuasion. Rhetorical insights specific to talking about smart developments – in theory and in practice – also include the use of policy rhetoric, scientific *and* contingency talk, expert, mediator and group representative ways of positioning.

These are all ordinary ways of making claims, of managing accountability and positioning, but the workings of these tools are not necessarily obvious to those who use them. We acknowledge that we apply here our own assumptions and gazes, but sharing these kinds of insights with peers across the SSH, ICT and policy domains is a step forward in raising awareness of how innovation discourse is constructed – discourse of smart in particular. By the same token, it is a step in raising awareness of how discourse of smart can be deconstructed in order to unravel and 'see' its built-in assumptions and, thereby, begin to ask more openly if the constructs we come across are genuinely what the authors intend to convey.

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