CANDID

Checking Assumptions aND promoting responsibility In smart Development projects

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Author:	Antti Silvast, Robin Williams, Charles Raab (EDIN), Daniel López Gómez, Israel Rodríguez-Giralt, Sara Degli-Esposti (UOC), Miquel Domenech (UAB), Kjetil Rommetveit (UiB)
Reviewers:	Alessia Tanas (VUB), Sissel Småland Aasheim (UiB)
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Introduction

This deliverable contains the first communication package aimed at the CANDID 'extended peer review community' (Funtowicz and Ravetz 1993). Its aim is to carry out an extended dialogue between SSH and ICT - LEIT communities that can provide multi-directional checks on assumptions operative in main ICT -LEIT agendas. That is, CANDID being an SSH project, it proposes that SSH scholars possess certain key insights and qualifications that could be used to question, critique, articulate and improve on, themes, topics and beliefs whose validity is taken for granted within the ICT - LEIT fields. As the project is intended to function within the ICT programme, it also provides the opportunity for ICT- LEIT practitioners to answer back to SSH scholars, thus providing a mutual check.

Such 'checks on assumptions' especially address the public role of 'smart' technologies, and is concentrated around three thematic areas, or modules as described in DOA: user configurations, risks, rights and engineering, and sensing infrastructures. The dialogue with peer reviewers will be followed up and supported by discourse analytical work, describing and analysing the ways in which a discourse on 'smart' becomes embedded within and across the three thematic modules. The purpose of such critical dialogue is to arrive at fuller and more comprehensive understandings of the problems underlying and informing main policy programmes and agendas, hopefully also to contribute to better public policies and innovation practices.

Peer Review for Module 1 - User and design configuration

The CANDID Module 1 (M1) is organised around the study of user and design configuration in two core areas: smart energy technologies and smart care technologies. By smart energy technologies, we refer to the smart grid, electricity infrastructure that involves the increasing use of ICTs to collect data. The key smart grid technologies we have been investigating are smart energy meters installed in domestic buildings and small businesses. Smart care technologies include self-tracking software, health monitoring systems, smart watches and other wearables, all aimed at collecting data about people, their habits and health and letting people learn about these.

From March 2017 to June 2017 as described in the Description of Actions document (DoA), the Module has undertaken the collection of a written consultation form from experts on the domains that it studies, henceforth called an *extended peer review* in this document. This work happened in parallel with similar tasks taken in other Modules of the CANDID project.

The planning phase of this peer review from January to March 2017 included a meeting of the CANDID consortium in Amsterdam on 17 February 2017 and consulting with other CANDID partners via regular emails and Skype conference calls.

This document explains the peer review method and the distribution of our peer responses.

The extended peer review methods and materials

To conduct its extended peer review, the CANDID Consortium agreed on triggering open responses in an electronic question from a community of peers in the areas of smart energy technology and smart care technology. The question form is included in **Annex II** of this report.

Building on the agreement between CANDID partners, the final consultation document consists of two sections:

- Section 1 explains our approach to smart energy and smart care and defines the core concepts.
- Section 2 has ten (10) open-ended questions that the peers were asked to answer.

The question form was piloted in March with two experts at the University of Edinburgh and the Module 1 leader, which led to a number of clarifications. These concerned especially how the questions would effectively prompt the types of answers that this research needs.

Main areas of inquiry

Main areas of inquiry in M1 concern the following aspects, similar across smart energy and smart care:

- Anticipated users of smart technologies
- Designing smart technologies

Peer Community

The Edinburgh Module 1 leader sought possible names for peers, both within the module and in coordination with the CANDID partners and within our wider network of experts working on smart energy and smart care. Our key criterion was acquiring a group that is a mix of academics and non-academics (e.g practitioners, managers, ICT experts) and engineers and social science and humanities researchers in line with the DoA aim of fostering dialogue between these groups through CANDID. We also had a particular interest in reaching out to peers who worked in other projects funded by the EU on “smart”, such as FP7 programmes. The initial possible list of groups to contact included:

- Academics: e.g. individual researchers, academic networks, university research groups
- Businesses: e.g. electricity suppliers, social enterprises, technology companies
- Hospitals: e.g. cities, their consortiums
- Associations: e.g. cross-industry and energy conservation groups
- Public consultation responders
- Non-Governmental Organisations: e.g. climate and energy organisations
- City councils

With these groups in view, the consortium created a list of 120 names of corresponding peers. We focused this selection on peers with relevant research or practical experience, or both, in our areas of inquiry. Geographical factors were not decisive in selecting our peers and they include colleagues from Europe such as UK, Spain, Scandinavia, France, and Italy as well as outside Europe including the US, Canada, and Australia.

Table 1 in **Annex I** of this document shows the distribution of the replies and the invitations sent in both of the areas of smart energy and smart care. This table also shows the division of our replies between academic and non-academics, engineer and non-engineer, women and men, and the institution of the responder, as well as their geographical distribution (see *Received Responses* below for further details).

The invitations

From March 2017 to June 2017, the Edinburgh Module leader sent out invitations to the 120 identified peers. The invitations were sent in an email that a) introduced the project, b) briefly described the connections seen between the project and the peer and 3) requested the recipient to send a contribution, when feasible, by a certain deadline.

The email included 2 attachments:

- The question form (Annex II of this document)
- The consent form (same for all modules)

The initial email gave the respondent two weeks to get back to the researcher. If no response to the email or no consultation document was received by that date, the researcher then sent two subsequent reminder emails. In these reminders, we also promised that the consultation could happen via a phonecall or Skype if the person preferred that over providing a written response.

Received Responses

As shown in the table in Annex I, the M1 has received a total of 28 responses. Out of these, 15 were in smart health and 13 in smart energy. The response rate in total becomes 23%, with smart health's slightly higher rate of 26%, and smart energy with 21%. We can see that academics and non-academics are well-balanced in smart health – 7 and 8 respectively – but that academic peers are somewhat over-represented in smart energy (9 v. 4).In contrast, smart energy contains a balanced mix of engineers and social science and humanities researchers, but in smart health, there are slightly fewer engineers in comparison.

In both of these groups, peers working in universities form the core, with 9 respondents in both areas. The remaining peers work in various types of associations (e.g. for energy conservation, smart energy campaigns, citizens advice, or foundations) or hospitals (in the case of smart health), with two additional peers in a consultancy and a city council.

The group of smart energy peers has almost as many women as it does men, but men are somewhat over-represented in the smart health care case.

Considering the types of responses (written v. oral), we can see that written responses were preferred by most of our respondents. In the smart energy case, 5 peers and in smart health, 3 peers were interviewed over the phone or Skype with notes made by the researcher in order to fill in the questionnaire form. With permission of the subject these survey interviews were also recorded; the recordings are in the possession of the module leader.

As mentioned above, geographical factors were not decisive in selecting the peers for the review. As identifying the peers relied on our own academic networks, and as the two partners of this module work in the UK and Spain respectively, most peers come from those two countries as a consequence.

Challenges and Opportunities encountered during the Peer Review

Promises not kept

While the consultation received prompt promises from several of our peers, the eventually arrived responses were somewhat lower. There may have been a number of reasons for this lack of responses. The most common explanation by the peers themselves was lack of time and their other commitments. The perceived length of the question form, with a 3-page introduction and 10 open-ended questions, may also have decreased the willingness of the peers to respond even though the form highlighted that we are also interested in partial answers. In future enquiries, it may be necessary to consider the number of questions carefully in order to gett an effective number of responses to a consultation such as this.

Reaching out to non-academics

As the research progressed, it became apparent that our group of respondents will have an over-representation from peers working in universities, which turned out to be true. Midway in the consultation in April 2017, the Module leader adapted to this by scoping more contacts from experts dealing with smart technologies in their everyday work, especially through known contacts from our academic networks. The initial response to these contacts with experts turned out to be high, but fewer peers eventually delivered a response. Non-academics were particularly difficult to reach in smart energy, and especially among UK peers. This may relate to the voluntary nature of smart-meter rollout in UK's homes, recent media debates on the economic and other benefits of smart metering in households, and a perception that we seek further to expose issues with the UK's smart meters, even if that is not our direct aim. Among the peers themselves, another recurrent reason for non-responses was that the question form was circulated in the organisation and then did not prompt any response from mailing lists or known colleagues of initially contacted peer.

Way Forward

The peer communication for M1 will proceed through the following stages and methodologies:

- M1 specific => Project months 7- 8: interviews with selected persons. These will be conducted preferably by Skype. They will be centred on M1 areas of inquiry and the questions from the consultation form play a role as structure to these talks. As semi-structured interviews, however, the interviews will also be open to new themes that emerge in dialogue with the peers. The interviews may involve individuals who have already contributed to M1. They will also include individuals who have not contributed as yet and who come form fields of experience and knowledge domains that may at the moment still be under-represented in the CANDID peer community, especially those not working in universities and more ICT experts. As such, these interviews are meant to respond to both of the challenges and opportunities encountered during the written consultation. First, rather than approaching our peers with a relatively long consultation

form, we aim at promising a less structured, more flexible conversation that should not take up more than 30 minutes of the peers' time unless they desire so. Second, each interview will be conducted by researchers who will be directly responsible for collecting the data and can help in explaining any questions that the peers may have in that regards.

- Same for all project => Project month M9: Meeting of the consortium as a whole with 16 representatives from 4 groups included in peer and public communications (SSH and ICT representatives, public innovation initiatives, interest / activist groups) for a full day's workshop.

- Same for all project => Project month M12: Final conference: open call conference in which the consortium introduces the CANDID results, disseminates preprints of scientific articles and shorter briefs, and showcases the online communications of the project.

ANNEX I – RESPONSES AND INVITATIONS

Table 1: M1 peer review distribution of the responses

	Smart energy	Smart health	All
Posting (N)	62	58	120
Responses (N)	13	15	28
Response rate	21%	26%	23%
Academics (N)	9	7	16
Non-academics (N)	4	8	12
Engineers (N)	6	6	12
Social science and humanities (N)	7	9	16
University (N)	9	9	18
Association (N)	3	3	6
Hospital (N)	-	2	2
Other (N)	1	1	2
Women (N)	5	5	10
Men (N)	8	10	18
Written (N)	8	12	20
Oral (N)	5	3	8
United Kingdom	10	3	13
Spain	-	6	6
Italy	-	2	2
Finland	2	-	2
France	-	1	1
Sweden	-	1	1
United States	-	1	1
Canada	-	1	1
Australia	1	-	1

ANNEX II – M1 COMMUNICATION PACKAGE

a) Smart energy

SMART ENERGY TECHNOLOGIES

Your invited contribution

We invite you to answer the open-ended questions at the end of this document. You do not need to answer all of them. They are meant to elicit reflection upon users and designs of smart energy technologies. Feel free to choose the writing style and terms you feel most comfortable with. Your comments can relate to other topics or technological applications which are not explicitly mentioned but that in your opinion are relevant and might provide important new avenues for our research.

The following section of this paper provides background information on the topics where your expert contribution is requested and then articulates the open-ended questions.

Context for your contribution

The *smart grid* refers to electricity infrastructure that involves the increasing use of ICTs to collect data. This 'smartness' promises new possibilities for active management of electricity networks at different levels, from energy generation plants to electricity distribution and end-users in their homes. The key smart grid technologies we are investigating are *smart energy meters* installed in domestic buildings and small businesses. These allow measurements of consumption data and its transmission to energy operators. The idea here is that users will be able to manage their energy demand in new ways by using this data; whilst energy providers will have more detailed real-time information about energy consumption, and be able to control energy consumption more.

The rollout of smart grids and smart meters involves building and maintaining new ICT and electrical infrastructures on a massive scale. Hence, device manufacturers and grid management services have a clear commercial interest in their diffusion. Moreover, 'smart' energy has also permeated policy agendas for several years now, where it has become of strategic importance for various ends. These range from transnational integration of national energy systems to cost-effectiveness in infrastructure investments and grid management, balancing variable renewable energy like wind and sun and establishing new markets to facilitate interactions between energy providers and end-users.

Yet, controversies and conflicts have emerged over smart energy systems. For example, people have reacted against and opposed smart energy meters in avoiding information overload or out of concerns over privacy or protection of their personal data. There have been anti-smart meter campaigns, law suits against smart metering, critical reports by consumer organisations and administrations passing motions against smart meters in several countries, including Canada, the Netherlands, Australia, the US and the UK.

The EU CANDID research programme aims to comprehend the challenges to research and practice in this subject by tapping a wide range of academic and professional expertise. Our main goal is to explore different understandings of 'smartness' especially in the areas of smart energy. We ask what kinds of smart systems are envisaged and who their anticipated users are; citizens, households, vulnerable groups, or others? By focusing on representations of users in smart technology and its design, CANDID explores what 'smartness' implies for various types of providers and users. We will also pay specific attention to what the increase of data implies for these actors and develop more robust understanding of what kinds of information transmissions happen via smart technologies among energy producers and users.

Open-ended questions

Anticipated users of smart

1) Who do you see as the most important potential kinds of user of smart grids and smart meters? Please provide a list.

2) For each of these users, can you detail how you think they might use these technologies and what would be their main benefits and limitations?

3) Do specific kinds of users have difficulties to access the potential benefits of smart grids and smart meter technology? Why?

4) Do you think that some users are reluctant to adopt smart grids and smart meter technologies despite having access and being aware of their potential benefits? Please, give us some real-case examples if possible.

5) Does the notion of 'smart' have different nuances between different kinds of users: for example, 'savvy' users such as citizen initiatives or the quantified-self movement or consumer groups advocating more consumer-led smart energy developments? Do these conceptions differ from or resemble those of smart device manufacturers or energy companies?

Designing smart energy technologies

6) Which needs are driving smart energy developments: for example, 'technological push' from the ICT industry, the electric power generators and distributors or the needs of energy users?

7) Are users usually involved and do they participate in designing these technologies? How?

8) What advantages and disadvantages may user involvement bring for designing smart energy technologies?

9) 'Smartness' raises crucial questions about the protection of fundamental rights and values like privacy, data protection and autonomy. Anti-smart meter campaigns, law suits against smart metering, consumer organisation critiques and motions against smart meters exemplify these problems. Do you think these objections have made designers and policy-

makers reconsider and modify their projects? Please provide details of any examples where you think this has happened.

10) How do expectations about the users and uses of smart energy technology differ across countries, for example in different EU member states?

b) Smart care

SMART CARE TECHNOLOGIES

Your invited contribution

We invite you to answer the open-ended questions at the end of this document. You do not need to answer all of them. They are meant to elicit reflection upon users and designs of smart care technologies. Feel free to choose the writing style and terms you feel most comfortable with. Your comments can relate to other topics or technological applications which are not explicitly mentioned but that in your opinion are relevant and might provide important new avenues for our research.

The following section of this paper provides background information on the topics where your expert contribution is requested and then articulates the open-ended questions.

Context for your contribution

Smart care technologies include self-tracking software, health monitoring systems, smart watches and other wearables, all aimed at collecting data about people, their habits and health and letting people learn about these. Most systematic reviews in health care find no strong evidence of the efficacy of smart care technologies. However they have gained traction as potential solutions for the problems of modern ageing societies, and for promoting healthy lifestyles. They are often presented as measures for cost reduction and time saving: reducing hospital admissions and doctors' visits, easing the care-giving provided by the family and non-professional carers, and reducing the economic cost of nursing homes, hospital admissions and prolonged home care. Smart care technologies often encourage disabled and older people, and those with chronic conditions, to self-manage their care, with a promise of greater independence and participation in social activities. They are also presented as solutions to ease the burden of care of family and friends of disabled, elderly or ill people.

In addition to promised benefits for vulnerable people and their relatives and informal caregivers, smart care technologies are expected to contribute to public health in various ways. By combining data from different sources, these technologies enable the discovery of risk factors across groups and populations. They are also expected to foster and promote healthy behaviour by means of constant monitoring and immediate feedback. Although people can use these sensors while on the move, many smart care technologies are

designed to be implemented within homes. Examples include smart-home health and wellness monitoring technologies, safety monitoring technologies such as telealarms, home rehabilitation systems and treatment-efficacy programs.

Despite the large range of promised benefits, some commentators and scholars are critical about smart care technologies and interpret them as a search for a technical fix to addressing burgeoning problems of care in times of austerity. Critical voices also contend that smart care technologies reinforce exclusion, threaten privacy and discriminate against those groups that are not able to self-manage their care.

CANDID examines different user representations in smart health care, lifestyle and well-being practices and argues that smartness means very different things for various potential users of these technologies. These relevant groups range from consumers who are expected to self-manage their health and perform self-care, attaining independent living via smart technology to health and social care professionals, relatives and informal caregivers using smart technology for optimization of care delivery, more personalized and earlier diagnosis and faster, more prevention-oriented and non-intrusive interventions. As such, smart projects offer their users different types of autonomy and possibilities, whether the users are simply acted upon (e.g. through automated 'smart' systems) or expected to self-manage their health and wellbeing by adopting behavioural changes. By examining these themes, CANDID calls for a more robust understanding of what kinds of information transmissions happen via smart technologies, from care providers informing final users to these final users informing providers about their needs, health and wellbeing, or more active interventions by providers on specific care needs.

Open-ended questions

Anticipated users of smart

1) Who do you see as the most important kinds of user of smart health and social care technologies? Please provide a list.

2) For each of these users, can you detail how you think they might use these technologies and what would be their main benefits and limitations?

3) Do specific kinds of users have difficulties to access the potential benefits of smart care technology? Why?

4) Do you think that some users are reluctant to adopt smart care technologies despite having access and being aware of their potential benefits? Please, give us some real-case examples if possible.

5) Does the notion of 'smart' have different nuances between different kinds of users: for example, 'savvy' user groups such as citizen initiatives or the quantified-self movement or patient groups advocating more user-led smart-care developments? Do these conceptions differ from or resemble those of smart-device manufacturers or healthcare companies?

Designing smart care technologies

6) Which needs are driving smart care developments: for example, 'technological push' from the ICT industry, the healthcare companies, or the needs of patients?

7) Are users usually involved and do they participate in designing these technologies? How?

8) What advantages and disadvantages may user involvement bring for designing smart care technologies?

9) 'Smartness' raises crucial questions about the protection of fundamental rights and values like privacy, data protection and autonomy. Do you think objections to smart technology have made designers and policy-makers reconsider and modify their projects? Please provide details of any examples where you think this has happened.

10) How do expectations about the users and uses of smart care technology differ across countries, for example in different EU member states?