

Report on Module 3 discussions

CANDID Peer Consultation

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1 Evaluation

CANDID researchers spent the day following the Peer Consultation on 2017-09-26 with internal discussions. There was time to evaluate the peer consultation. Our conclusion is that the peer consultation was super useful for the whole project. After a round of surveys and a subsequent round of interviews, it was the first time that we could discuss our interests with a focus group of relevant parties.

We also made out internal evaluation with the CareNet research group (the Barcelona partners in the consortium, including Israel, Dani, Ramon and Maxigas). On the one hand, we really felt that our thinking about sensing infrastructures and smartness regimess moved significantly forward as a result of the peer consultation. These insights are summarised below in sections called “Theoretical lessons”. On the other hand, our expectation that since the meeting happens in Barcelona, we can gather a lot of local peers and learn more about a variety of perspectives, was misguided. Perhaps exactly because the meeting happened in their home town, many peers cancelled the meeting in the last minute and we did not have enough time to invite others. In any case, everybody had a good time even in the middle of distractions such as the political crisis in Catalunya, which we inevitably followed and discussed during the day.

2 Presentation

- Maxigas speaking in the name of Module 3, “Sensing infrastructures”.
- Slides: <https://slides.metatron.ai/candid/>
- Article: <http://candid.b.uib.no/2017/09/19/candid-module-3-looks-to-rebrand-social-scientists-from-party-poopers-to-innovation-pathfinders/>

2.1 EU: SSH + ICT = RRI

The European Union (EU) is interested in finding out how to incorporate perspectives of Social Science and Humanities (SSH) scholars into the work of Information and Communication Technology practitioners. Such interest is one ambition amongst the many that characterise the EU Responsible Research and Innovation (RRI) agenda. Thus, we started with these predefined categories – we received them as our basic units of analysis from the EU. However, our preliminary results casts doubt on whether the fault lines really run between SSH and ICT communities. Therefore, the presentation aims to question and suggests to transform these categories. In a few minutes, we should have a very different understanding of difficulties in interdisciplinary work...

2.2 Hypothesis

Another way of situating the problematic is not between people of different backgrounds but between different ways of talking about technology. We observed, for example, that in an interview situation engineers can often reproduce social scientific perspectives without difficulties, which proves that they are aware of non-technical contributions. From this, we learn that actors can speak “multiple languages”.

However, these discourses (or ways of talking) do not necessarily refer to each other. For instance, does an engineer change the design of a product because awareness of social scientific perspectives? Or similarly, can a social scientist express the ethical issues raised by a technology in terms of its technical specifications? Without effective translations, these visions of the world exist as alternative realities which are more or less consistent compared to themselves only, but not necessarily compatible with each other: they follow different logics.

We tentatively propose to call them *smartness regimes*, since each specifies an ordering of ideas on smart technologies that structures how a certain topic is discussed. We identified three of them in our preliminary analysis, but evidence suggests that there are more of them:

- Scientific
- Civic
- Bureaucratic
- ...

The *scientific regime* is about finding a truth. Scientific questions raise doubts and summon worries about the accuracy of the data, and how sensings correspond to what is “out there”. The point is to establish a strong and meaningful link between reality and its representation.

The *civic regime* is about raising issues in a public debate, constructing the conditions for legitimate democratic participation, or even arguing a case in court effectively. Data from sensing infrastructures is mobilised as a set of “objective facts”, and as such it is used as a “superior argument” in debates. Data counts as more hard evidence as other testimonies, so actors use its hardness to thematise issues and push arguments.

The *bureaucratic regime* is about operationalising sensing. Policymakers look for ways to insert these technologies into their existing practice, daily routine, regulatory framework, stakeholder agreements, etc. They need to clarify the rules about which data should trigger which sequence of actions.

Based on the written evidence and the interview recordings we suspect that depending on what question we ask, our interlocutors are inserted into one or another regime, perhaps independently of their role as ICT or SSH peers, or their position in society, or their background and education. Then, it is hard to formulate ethical doubts meaningfully within the scientific regime where revolves

around the accuracy of the data. Conversely, when it comes to operationalising data within the bureaucratic regime, it is not a good time to worry about whether it is actually accurate in terms of measuring what it is claimed to measure: the only relevant point is what to do depending on the result. Of course, each person is still mainly tied to one or the other regime, depending on what kind of questions their job raises on a daily basis. But the engagement with the regimes is more complicated and subtle than what the ICT/SSH categories suggest.

3 Morning break-out session: Module 1 on sensing infrastructures

Module 3 break-out session team:

Participants:

- Ana Neves, FCT, Science and Technology Foundation of Portugal, Director of the Information Society Team
- Daniel Lopez (CANDID), social psychologist, Science and Technology Studies scholar, Open University of Catalunya
- Douwe Schmidt, community manager at Fairphone, participant in the Air Quality Egg / Citizen Science Kit trial with the Waag Society, co-founder of GR1P Foundation
- Maxigas, Science and Technology Studies scholar, Open University of Catalunya
- Nora Sørensen Vaage, interdisciplinary scholar, Maastricht University and Bergen University
- Ramon Ribera, political economist and human geographer, Open University of Catalunya

Module 3 researchers are mostly interested in how the hypothesis of the regimes resonates with the ideas and experiences of peers. In response, Douwe describes his experience with the Smart Citizen Kit (Air Quality Egg pilot project by Waag Society in Amsterdam), and Ana talks about the multi-stakeholder approach to ICT4D implemented in Portugal. Members of the Barcelona team chime in with observations and data, ultimately reformulating the theory of regimes.

3.1 Case: Citizen Science Kit / Air Quality Egg pilot, Amsterdam

The starting point of the conversation is Douwe's observation that the Citizen Kit did not perform like it was supposed to. First, setting up the equipment required too much technical expertise from citizen participants. Then, once the

equipment was set up it was clear that the data on air pollution is not accurate at all. Finally, lot of participants were motivated to take part in the pilot project because they wanted to use the data to raise the problem of air pollution. They came inspired by the super-smart city agenda of Amsterdam and in the end they were very dissappointed.

Andres (who is doing an ethnography on Internet of Things engineers) acknowledges that sensors are a classic problem for IoT engineers: are notoriously hard to calibrate.

Taking a step back from the immediate, immersed perspective on the Citizen Science Kit experiment, one is still left with a bad taste in the mouth, because it continues to be advertised as a success by the organisers. The Waag pilot is still used in huge smart cities conferences as the flagship best practice case that shows how to involve citizens in smart developments, and which justifies the introduction of the whole regime. Considering the experience from this point of view, Douwe says about participants that “They were an asset being sold to brand the city.”

Maxigas talked to a researcher based in Rotterdam recently (Ágnes Gagyí) who also saw smart city projects largely as technical failures but marketing successes. Her explanation from a World Systems Theory and political-economy point of view was that there is an ongoing competition between cities to attract investment, hi-tech companies, and other projects. In this competition they are desperate to demonstrate how modern and up-to-date they are, and smart city projects are simply a prop they can use to do that.

Israel wondered how we can generalise from the Waag experience: is that how most smart city projects turn out when they involve citizens? Are there other typical trajectories? He commented on the specific issue of low-cost air quality sensing. It is one of the things that is hard to do with cheap equipment. The Citizen Science Kit people stopped with the Air Quality Egg (the subject of the Waag pilot project) and shifted their emphasis on the other kind of sensors they had on the board, such as light and sound, which are more easy to measure, calibrate and interpret. They seemed to have better results with those ones. Douwe already said that while the air quality sensor is just producing random results, the noise and brightness sensors on the Egg were actually meaningful to him: showing the daily rhythm of the neighbourhood. It is not even necessary for them to be well calibrated in order to do that.

At this point we refer to another interview, this time with someone who worked on the Making Sense project. They collaborated with citizens to build sensors for measuring noise pollution in Gracia, for instance on the Plaza del Sol. However, they contextualised the quantitative data with qualitative information. They asked participating citizens to tag the voice events on the timeline according to how they feel about that particular sound: whether they like it or not. For example, the barking of dogs was pleasant for some residents even if it exceeded the legally permitted noise levels, but other sounds they found disturbing even

if they were lower than the official noise limit. Once there is a set of tags for each noise event, it is possible to aggregate them again statistically, and for instance having a debate about the appropriate times to walk dogs: a much more specific issue than noise pollution, and one that is closer to the life of people in the neighbourhood.

Nora talked about how low-tech sensing can actually be more expressive than high-tech sensing. Daniel commented that the tagging in Making Sense also turned the issue of noise from a legal challenge to a challenge of conviviality. As such, citizens are actually empowered to address the issue, while the city council is put in the background. The contrast with purely quantitative data from the Smart Citizen Kit is stark: the latter helps to frame pollution as a legal issue that the city council should address, but it is also not clear exactly how.

This echoes one of the quotes we received in the written consultation that we like to refer to: “In smart cities the citizens should be the ultimate sensors.” Here, citizens themselves were used as sensors and their input was a collective tagging of noise events. We note that many similar examples are reported by one of the most important books in the field, Program Earth by Jennifer Gabrys. Such experiences foreground that even if sensors can be made to operate with great precision, they only capture a very precise aspect of the phenomena, leaving out other facets of the lived experience. The notion is an essential one when the idea is to use sensors to improve shared living conditions in a city.

Israel summarised these points as having to do with the different ways of sensing as much as the different ways of participation in sensing projects. The question is what kind of data is produced and how it is translated, interpreted? This is called the Design of Data.

3.2 Case: Multistakeholderism in ICT4D policy, Portugal

Ana commented that the technical expertise of citizens is also a challenge for ICT4D policy in Portugal. The collaboration of citizens is an indispensable part of the implementation of smart cities and infrastructures. Yet, if they want 100% of the citizens to use and benefit from smart technologies, it is necessary to develop their digital competences:

“We are not replacing the human factor, we are making better lives. We have to work with the locals to make them a part of this digital transformation.”

Referring the bureaucratic regime, she put forward the idea of the multi-stakeholder approach as a way to bring a variety of perspectives into play within policy making. People who are not ready for the new technologies have to be educated on their benefits. For instance, in rural villages it is not enough to put broad-band Internet access, even if it is the first step. Careworkers in Portugal take tablets to the house of the elderly when they visit them, and then

these people who are not just old but also isolated can talk to their friends and family via videolink. This involves them in the benefits of the new technologies.

We identify some problematic points with the ICT4D discourse. Maria comments that needs are not something that are already there: they have to be constructed. So it is misleading to see policy making as simply responding to needs which are assumed to be there. Do the elderly really need these technologies?

Douwe comments that there is an air of an inevitable paradigm shift around digital technologies, the sense that everyone should get on board. Adoption is what we can measure – yet, referring back to the previous discussion about sensing infrastructures, what are the problems that are left unaddressed just because we cannot measure them? For instance, Making Sense and the Air Quality Egg focused on the issue of air pollution: a problem that is dear to middle class intellectuals and activists concerned about global challenges.

The overwhelming majority of participants in the Waag pilot project lived in rich parts of Amsterdam and saw air quality and even noise levels as issues that were relevant for their lives, which also made the project look good. However, he himself lives in a poor neighbourhood where local residents have very different things on the top of their agenda: are these voices being heard? Maybe communities are marginalised politically just because they do not fit into the idea of technological development – or development technology.

Ramon also chimed in here about a naive outlook on technology development: is it so evident that adopting new technologies improves the lives of people? Maxigas is reminded of the “technological imperative” discussed by Jacques Ellul and the more specific “digital imperative” discussed by Sally Wyatt: both notions examine the social pressure to adopt new technologies, and the arguments made to construe technological development as inevitable.

Andres pointed out that his ethnography highlighted the unexpected applications, uncalculated side-effects and unforeseen risks that new digital technologies such as the Internet of Things can bring – especially in the area of privacy rights. These could be seen as things that fall outside of the engineering problem, the perspective of the designers when it comes to construct an actual technology: so, the scientific regime. Technology shapes society – but does it do it according to the needs and wishes of the people? This brought us into a discussion of complications in cases where a top-down approach is combined with a bottom-up one: how can policy makers foster bottom-up approaches in an authentic way?

Maybe the problem is not that people lack technical skills to take advantage and receive benefits of new technologies. Another way of putting it is that the technology falls short of actual societal needs, because it is targeted at the most privilege strata of society. The experience in e-health of the CareNet research group at UOC (the Barcelona partners of CANDID) includes many customised and customisable technological solutions, aimed at very concrete

and very specific user groups, for instance with disabilities. These speak to a larger problem.

Maybe instead of developing “user friendly” technologies that can be theoretically applied anywhere and used by anybody, designers should target more well defined user groups. This is an alternative pathway for technologies with an emancipatory ambition. The commercial incentive for designing for uniform, global markets and taking advantage of mass manufacturing is huge. However, policy makers could support the bottom-up development of niche technologies in a top-down way – maybe a more successful endeavour than trying to make people adopt technologies which are not suitable for them. Designers who are integrated into the communities they design for may be able to address the lack of technical skills by the population. However, this is only possible if we start to blame the technology, instead of the users, for non-adoption.

3.3 Theoretical lessons

The discussions were interleaved with theoretical reflections developing along other kind of contributions. However, for the sake of presentation, they are treated here in a separate section. We started with the proposal of regimes as ways of talking about a topic – in this case, smart technologies such as sensing infrastructures – that have an internal logic, connecting different ideas and arguments, but which does not necessarily refer to each other. Therefore, regimes form a multi-verse of scarcely connected alternative worlds.

Ana and Andres already brought in problems from their own experiences with the bureaucratic regime (which can be made less isolated through a multi-stakeholder approach) and the scientific regime (which is dangerous if it remains isolated so that side-effects such as risks to privacy are not taken into account). However, the flesh of the discussion centred on Douwe’s experience with the Air Quality Egg trial at the Waag society, because this contained more empirical details and allowed for a more complicated look at the problem of regimes.

On the one hand, our hypothesis that regimes are somehow isolated even if actors in different social roles can exercise them, seemed to hold in the face of the peer consultation. On the other hand, it became evident that we have to think more about the specific ways in which regimes are combined in real world empirical cases. The latter problem is explicated in the next section. Ultimately, we left the conversation puzzled about a more abstract and theoretical question: who is exercising, defining, and deciding on the success or failure of a regime or its applications? This is a problem of social ontology that is explored in the next section following the next section.

3.3.1 Stirred or shaken: The Cocktail theory of regimes

Our main realisation during the first break-out session was that each project comes with its own mix of regimes: qualities which have to be successfully combined in a certain order, in certain quantities and in a certain way. Israel made comments to this effect: each constitutes a “truth test” that has to be passed before the next regime can be seriously engaged. Let us see how this works in the case of the Air Quality Egg pilot.

Amsterdam ultimately used the pilot for branding itself as a smart city, hub of innovation, good place for investment. Ramon suggested to call this mode of operation an innovation regime, which perhaps functions as a meta-regime, structuring others. In any case, for now we can incorporate this use of sensing infrastructures into the bureaucratic regime as far as it operationalised the pilot in a series of operations planned in advance (without reference to the success or failure, or other outcomes of the project). For the purposes of the city council, the bureaucratic regime was successfully implemented, irrespective of what participants and observers experienced, as far as the project can be showcased as a best practice to other city councils, players in the smart city marketplace, and outside investors.

However, why this branding was seen as hypocritical by participants such as Douwe and observers such as Dorien? In order to successfully implement the bureaucratic regime, at least the two other regimes would have to be successfully implemented too. On the one hand, the civic regime to show authentic citizen engagement with substantial issues through innovative technologies. On the other, the scientific regime that gives a perceived objective foundation and empirical robustness to the data thrown around by the other regimes.

First, the project was advertised as a “citizen science” project that helps residents to engage with issues they feel passionate about, in a way that supports advocacy and rallying around the topic. We called this *modus operandi* the civic regime where sensing data is used to put certain matters of concern into the spotlight, adding a rhetorical force to the arguments of sensing infrastructure users. In this case the topic was air pollution, and it seems a significant number of participants was actually passionate about it, so the human conditions for the successful implementation of the civic regime were fulfilled. However, the data was missing from the equation, with even the techies behind the board admitting that they created a “random number generator” instead of a sensor. This posed a bug problem for the civic regime because the rhetorical force of the data is an essential part of a successful implementation.

Why data construction failed? It failed because it was impossible to make a meaningful connection between what is understood as air pollution – that is, the quantity of certain particles and chemical compounds in the air of public spaces - and the numbers which constituted the output of the sensors on the Smart Citizen Kit boards. The establishment of a semiotic link between actually

existing phenomena in the outside world and the performance of lab equipment is the problematics of what we called the scientific regime. In terms of its failure, most commentators simply point out that air quality measurement is complicated, because it involves various kinds of substances and inferences from the presence of one material to the presence of the other, etc. So, measuring air quality is more difficult than other engineering challenges that are normally tackled by the “maker movement” or the “Shenzhen innovation cluster” where the former get their components from. Cheap sensors are simply not accurate enough to produce meaningful results. In short: science failed.

What we learnt from the story is first and foremost the dependency of regimes, then: the scientific regime had to be implemented only for the civic regime to be performed, but the civic regime was undertaken only as a requirement for the bureaucratic (or innovation) regime to be successfully performed. This is if we look at the whole trajectory of the pilot in a synoptic view of participants’ experiences. But partial accounts also warrant the conclusion that the three regimes depended on each other for their satisfactory performance. First, techies were frustrated by their failure to implement the scientific regime. They accommodated the material resistance of contaminant particles to be measured by DIY sensing apparatus by shifting their efforts to other areas of resistance. Second, citizens were ultimately frustrated in their hopes to implement the civic regime, since they could not use the data to advocate air pollution issues. Being unable to accommodate this misalignment into their practice, disillusioned by the promises of the new technology, they left the project. Dorien Zandbergen reports in our interview that air pollution activists since then scored a significant victory by suing the government over inaction – and she notes that citizen science did not play any role in those efforts. Third, the bureaucratic (or innovation) regime was perhaps performed successfully by Waag and the city council behind. Yet, they would have to accommodate the negative reports about citizen science, smart cities and sensors, which counterpose a different narrative than what is advertised at smart city fares. Douwe Schmidt, Dorien Zandbergen, and even Jennifer Gabrys who counts as an academic authority in the field, points to the shortcomings of Citizen Science Kit in terms of all three regimes. Of course, the fact that the success or failure of the pilot did not seem to matter from the point of view of the last regime warrants poses a challenge to our theory and warrants further attention. A possible source of the solution can be theorising innovation as a meta-regime framing the other three, which in this new sense would stand above the rest and have some kind of autonomous logic.

I think it is not a meta-regime. The fact that the salesmen of the city council succeeded does not mean that it is a metaregime... In fact, we are assuming that they succeeded but we need to look at the interviews to test so, moreover we need to understand in what terms this possible success is defined.

Furthermore, we note that not all regimes had to be performed perfectly in order to fulfill the requirements of the project. First, it seems that the scientific

regime did not have to be performed as well as in cases of academic research. Citizen science only requires that the data be “good enough” for raising issues – it does not have to possess the authority of a fully fledged scientific experiment. A dash of science would have been enough, as in the case of the sound and light sensors on Douwe’s kit, which can show a meaningful rhythm of life even if they are not well calibrated, or the noise sensors of Making Sense, which could be calibrated against the government sensors – a not very scientific way of doing things, but good enough if one wants to challenge government action on the governments’ own grounds. Second, Douwe points out that much of the frustration about the pilot project can be written down to different expectations about the extent that the civic regime would have to be performed, and perhaps even about the underlying dependencies. For techies, the civic regime was not a real interest, only a possible application of the technology that may provide legitimacy to, and perhaps further support for their efforts. For citizen participants, it was the core of the project that motivated them to take part, and against which they measured its success. In contrast, the Waag Society is construed as an organisation focused on implementing the civic regime – but as value-based engagement with technological development, not specifically in terms of air pollution. Therefore, for the Waag Society the simple fact that there were blinking machines (e.g. the semblance of the scientific regime) and impassioned citizens (e.g. the semblance of the civic regime) already fulfilled their mission as it was formulated: as a light mix of the scientific and civic regimes, mixed in an experimental form that favours discourse production over tangible results.

To come back to the crucial point: it seems that clarifying and negotiating these expectations about the order, quantity and quality of smartness regimes in the mix between the various parties involved would have been a great improvement of this interdisciplinary engagement. However, this would assume that actors play with open cards, there are no hidden agendas, and everyone acts in good faith. It is easy – and at the same time absolutely necessary – to accuse the public bodies involved with exploiting badly designed technology and superficial democratic participation for the commercial gains of hi-tech branding. It is also not the first time that hackers prove to be unstable allies of activists – as Douwe points out, his main motivation was also not about environmental pollution, but more aligned with the Waag idea of the civic regime: to get a small computer for free, just in order to experiment with it. In this specific sense, he is even a happy participant, because he got what he wanted. However, the take-away from this is that from a pedagogic point of view, it is safe to assume that most participants would arrive to interdisciplinary work with front-stage and back-stage agendas, which cannot necessarily be negotiated solely through a front-stage engagement.

In summary we sketched out the cocktail theory of regimes using the Waag pilot as a case study, where different regimes had to be successfully performed in order to implement its goals expressed in terms of the bureaucratic (or perhaps innovation) regime. Social facts were constructed in a way that it seemed necessary for citizens to enter the civic regime through the scientific regime, a

translation that most perceived as a failure. That is so even if only a bit more convincing performance of the scientific regime was necessary, nothing compared to a full-blown, certified clinical trial. The honesty and expectations of actors was called into question by the failure, and seems to be a crucial question in interdisciplinary work.

3.3.2 Problems of social ontology: Who defined regimes and their success?

The question that lingered over our conversation was a deeper one, however. Its disturbing presence was only a few times vocalised, but could be perceived by the shifting idiom around a central problem: “Whose regimes?”

Are regimes simply discursive formations that exist in language, perhaps as the capacities of speakers? It is easy to say that each individual actor has their own idea of regimes, their own idea how they should be combined, and their own opinion about the conditions that define a successful performance. However, these rules – as well as the nature, form and content of such regimes – would still have to be negotiated. It is perhaps more compelling to construe regimes as social facts which actors meet as external constraints. But then it is not clear whether there is a celestial cocktail recipe book that defines for each smart city project the necessary ingredients, their order and manner of combination, as well as the desired ratio – and a celestial mixer who judges the success or failure of the result.

Without being lost in a classic question (or some might say religious war) of sociologists – “Is it structure or agency?” –, we have to find a way to clarify the ontological status of smartness regimes. On the one hand: what are they? On the other hand: who can do what with them? We already started to discuss this, and it seems to be hard, because it necessitates clarifying our positions vis-à-vis different theoretical traditions; for instance structural-functionalism versus material semiotics...

4 Morning plenary

Feed back from the break-out groups ensued:

4.1 Module 1: User design configurations [mostly in e-health]

Resonating with our discussions in Module 3, Antti for Module 1 reported that they found issues about the differing agendas around the technological push for “smart”. For instance, it is not clear how the introduction of such technologies

is connected to the “pressing issues of the day”, how they work in terms of engineering effectiveness but also as a way to address these concrete problems, and who is responsible for organising around these barriers to adoption. Their discussion also overlapped with ours in so far as they had to question the “engineers versus sociologists” starting point of the debate, because the empirical material they worked through was more complicated. However, they seemed not to have doubted what we did find suspicious: the assumption that new digital technologies can play a role in social progress, and therefore their adoption is mandatory for all responsible citizens.

4.2 Module 2: Risks, rights and engineering [mostly in privacy-by-design EU policy]

Niels for Module 2 also found that mutual trust, overlapping agendas, and aligned interests are hard to find around smart technologies, even though it is hard to achieve anything without a degree of these. He highlighted honesty as the main problem in the implementation of “privacy by design” ideas into laws and technologies. Frameworks for privacy by design can quickly turn into mere legitimation devices instead of actual safeguards for citizens. For instance companies can tick boxes on a checklist and stop taking responsibility about the ethical implications of their business. Other problems is that both smart as a goal of technology design and data protection as a goal of policy making is too narrow to capture the substantial issues at stake. Some alternative ideas that came up were “sustainability” and “dignity”. Finally, the ultimate challenge is that lawyers are asking questions that may not technically have an answer. For instance “the right to explanation” in the new EU data protection policy (the General Data Protection Regulation) requires that engineers explain how exactly data is used – but in the age of machine learning this may not be feasible. It has to be negotiated where the responsibility lies.

Once again, the overarching theme was whether smart technologies answer real societal needs, and in any case how such societal needs may be produced, manufactured and negotiated? Is modernisation an actual regime or another thing (a meta-regime?) that is mobilised in different ways to different ends in different regimes? Kjetil concluded that all modules called into question the initial way in which they framed their research questions, which is important to do. Perhaps it also means that some moments of substantial discussion and intellectual exchange has taken place.

5 Afternoon break-out session: Crosscutting themes – Inclusion/Exclusion

Participants:

- Daniel Lopez (CANDID), social psychologist, Science and Technology Studies scholar, Open University of Catalunya
- Felip Miralles Barrachina, economist, EURECAT Technology Centre of Catalunya
- Irina Shklovski, human computer interaction expert, IT-University of Copenhagen
- Maxigas, Science and Technology Studies scholar, Open University of Catalunya
- Ramon Ribera, political economist and human geographer, Open University of Catalunya

5.1 Context: Cross-cutting themes

There were three crosscutting themes identified by CANDID researchers before the meeting, based on the preliminary analysis of the empirical data:

1. ***Conflations of citizens' roles in smart projects:*** Is there a confusion between citizen and consumer at work? Are there structural and architectural reasons why it is so hard to take users' and rights holders seriously? Should systems be designed more from users' and rights holders' perspectives, and less from a systems or systems developers perspective?
2. ***Role and quality of data:*** In several of our cases we see that even quite raw and inconclusive data are used by actors for strategic purposes. Is this the normal state of affairs within smart environments, or is it a temporary stage to be overcome by later improvements? Are such uses of data somehow problematic relating to the public character and role of smart projects?
3. ***Inclusion/exclusion:*** There is a lack of attention to individuals, groups and communities left out of smart development projects, be they seen as 'laggards', 'late adopters' or even ignored altogether. (Example from M4: "Er, nobody is a priori excluded by definition but, er, on the other hand not everybody's consulted of course because it's impossible to consult the five billion people on the earth"). Question: What are the reasons for this state of affairs? Are people excluded by design, or is it rather due to the sheer complexity of the projects? Will smart developments eventually 'lift all boats', or are these technologies primarily beneficial for people of resource and early adoption?

The Module 3 team took responsibility for the latter theme of Inclusion/Exclusion, with Daniel Lopez facilitating the discussion in reference to quotes submitted by all modules. The ensuing discussion was propelled forward by Irina Shklovski's blazing critical insights, unfolding in a dialogue with Daniel, while others chimed in occasionally. So most of the ideas below are based on Irina's contributions, unless otherwise stated.

5.2 Universal versus situated technologies

We started with the idea that emerged in our morning break-out session, that there are two different ways to understand inclusion in technology design and adoption:

- *Universal technologies*: Products for everyone.
- *Situated technologies*: Solutions for specific (underdog) social groups.

We agreed that the difference is not tied to specific disciplines (such as engineers versus sociologists), or even regimes (such as the bureaucratic regime vs. the civic regime). Instead, it depends on the end goals of actors. Depending on which one is in the crosshairs, the rhetorics and arguments for inclusion/exclusion are different.

The next point we clarified is that inclusion can be both superficial or deceptive. On the one hand, superficial (or virtual) inclusion can be detected in the speech of policy makers: one interviewee said that even though it is clear that not everybody will use the new smart city services, as long as everybody has access to them in theory, they are sufficiently inclusive: “I am not saying that you will, but if you want you can, right?” On the other hand, activists often complain about cooptation once their struggles are turned into lucrative products valorised on the mass market: here the argument is that once the technology reached the masses, it has been already been stripped of its critical purpose. The idea of “openness” is a case in point for both problems: it started as a genuine discourse about universal access and democratic participation, advocated by technology activists and engaged engineers, and ended up as a false commitment in the form of a marketing buzzword for big corporations. (Russel tells the whole story in *Open Standards and the Digital Age: History, Ideology, and Networks*.) Here the question arose whether there is such a thing as universal inclusion, where everybody participates in a substantial way and there is no corresponding effect of exclusion?

Daniel came up with the idea of *contestable technologies* as an alternative to *open technologies*, which was something that Irina criticised a lot. She pointed to a sly move in open sourcing technologies: sometimes opening a technology is an excuse to leave critical issues unaddressed. Taking care of critical issues is then offloaded or outsourced to its very users and user groups. The idea of contestable technologies would be to guarantee that a technology can be directly contested by affected users, so their concerns would have to be taken into account by the provider or manufacturer.

5.3 Genuine commitment to inclusion

We even questioned whether it is possible to talk about inclusion/exclusion in a non-binary frame, for instance taking up the way that rights are framed. The problem with rights, however, is that they are too legalistic: it is perfectly

possible to abuse people while respecting their fundamental rights. Maxigas mentioned the two different paradigms of security management: security by compliance (bad) and security by values (good). The problem is similar to rights: as long as there is no genuine commitment from the organisation, it is hard to secure either safety or rights.

5.4 Inclusion on the scale of cities

Finally, we returned to constructive proposals. We decided to look at Barcelona as a case study, since we had Felip as a local policy maker and Ramon as a local human geographer at the table. How the difference between universal vs. situated technologies plays out on the scale of a city?

Ramon told us that it is interesting to see how smart *cities*, rather than smart policies or smart countries are the focal point of discourse on smartness. The city is geographically localised, which allows for specific types of inclusion and exclusion. For instance, a city is an entity which can potentially challenge globalisation by virtue of its bounded spatiality.

Felip came up with a heat map of Barcelona showing where families who receive subsidies from the government live, and another one that marked buildings without broadband Internet access. The two maps resembled each other closely. The two maps represented a double exclusion: it is not enough that families are poor, their lack of adequate Internet provision also means things like their children cannot do their homework as well as the other kids at school, lacking good access to Wikipedia, for instance. Therefore, inequalities are reproduced in society through the different levels of access to public infrastructure. Universal access is the idealistic solution to this. Indeed, activists of the largest community network in Europe (GuifiNet) regularly advocate bringing fiber optics to these buildings. Fiber optics is the fastest form of Internet access and with the collaboration of the council it could be provided far below market price. However, these poor families would not be able to pay even the subsidised price (40-50 EUR a month), and normal broadband is in fact enough to answer the needs of these households. Therefore, instead of universal access, they need a tailored solution that is designed from the ground up taking their situation into account.

5.5 Technological sovereignty

Before we ended the conversation, the idea of technological sovereignty came up as a discourse that includes the problematics of universal and situated access. It is an activist discourse that have been embraced by the Barcelona city council and other organisations. Maxigas is involved in a book project on technological sovereignty which publishes its second volume this month.

6 Afternoon plenary

All plenary moments have been recorded. We are waiting for the audio to come in to document these sessions properly. Please stand by for more information.