

Module 3: Peer consultation

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CANDID

**Checking Assumptions aND promoting
responsibility In smart Development projects**

Figure 1:

Introduction to Module 3

Main goal

Facilitate collaboration between different *epistemic networks* in interdisciplinary work, such as Social Science & Humanities (SSH) scholars and Information & Communication Technology (ICT) practitioners.

Sensing infrastructures have the ability to record, encode and analyse physical attributes, that is their *sensations*, by means of connected sensors, big data analytics, and the participation of citizens as codifiers or interpreters of this new source of information.

- Smart cities
 - Environmental pollution monitoring
 - Disaster preparedness and management

1. **Awareness:** How sensing infrastructures change our understanding and approach to issues?
2. **Participation:** How citizens are empowered or put at a disadvantage through sensing infrastructures?
3. **Fair machines:** How ethical values are encoded in autonomous systems and who should be responsible for automatic decisions?

Results from peer consultation

Question form of the survey and interviews

Q1. Do you know other interesting projects that you would like to share with us?

Q2. In your opinion, what are the fundamental risks, open issues and major benefits of relying on sensors and sensing infrastructures?

Q3. Which group of users (e.g. citizens, policy makers, private firms, scientists, etc.) do you think can benefit most from - or face negative consequences from - the deployment of sensors and sensing infrastructures?

Q4. In what sense sensing infrastructures might be challenging the way we perceive, understand and tackle certain problems and issues? Please provide some examples.

Q5. Do you think the pervasive implementation of sensing infrastructures could create misleading perceptions of certain issues among users? Please provide some examples.

Question form of the survey and interviews

Q6. What role do you think citizens should play in relation to these sensing infrastructures and overall speaking in smart city projects?

Q7. In what sense do you think sensing infrastructures might enable or rather disable citizens' participation and collective responses to public issues? Any example to share?

Q8. In which cases do you think autonomous machines can provide fairer solutions or rather reproduce prejudices and moral assumptions that generate ethically controversial decisions? Why?

Q9. Who should be responsible for checking the accuracy and appropriateness of the decisions made by autonomous systems?

Q10. Any additional comment?

- **Survey:** 104 invitations, 25 answers, 24% response rate.
 - ICT: 80% (n=19)
 - SSH: 20% (n=5)
- **Interviews:** 15 interviews, more pending, transcription in progress.

Codes:

- Survey: WE2-QA1 means
 - **W**ritten **E**vidence **2**, answer to question **1**
- Interviews: I6-ICT5 means
 - Interview **6**, **ICT** practitioner **5**

Key findings

- SSH scholars tend to be more negative/critical than ICT practitioners.
- SSH scholars focus more on the present (realities), ICT practitioners on the future (promises).
- Peers often emphasise nuances, complexity, aporias: smart is an emerging field.

Awareness: ICT

WE1-QA1: *It gives us the “6th sense” beyond what we have now.*

WE2-QA1: Realtime understanding of issues and better preparedness in advance

WE3-QA1: we will start to understand the correlation between hitherto unconnected events and occurrences.

WE7-QA1: Improving awareness of situations and contexts, with quantitative data

WE16-QA1: It could increase our reliance on evidence over opinion.

WE25-QA1: **I don't believe sensor systems will create a reductionist vision of complex problems.** I think the fundamental problem for addressing many of society's problems is a lack of understanding what is causing them. While the cause may be readily apparent or even obvious, human interactions and illogical

Awareness: SSH

WE11-QA2: whatever data is collected under the assumption of individualism is reproducing a certain epistemological practice and, in perspective, *make other epistemological approaches weaker and weaker.*

WE24-QA1: Depends on what we mean by “sensing infrastructure” (. . .), the response would be different.

WE13-QA1: We might be tempted to yield too much control to these infrastructures

WE13-QA2: We might come to have a different/inaccurate understanding of our environment?

WE24-QA2: Yes, because the disentanglement between the sensing devices and the object / system sensed **may make the causality of the data less visible**, and therefore less accountable, as happens with air pollution.

WE25-QE1: I think the **citizens themselves should be the *ultimate sensor in a smart city*** project.

WE4-QE1: The sensing infrastructure should be *citizen-centric* and for that reason citizens should play an important role in smart-city projects.

WE14-QE1: The citizens should be placed in the center of the solutions to create and should be the main actors around the services and applications should evolve.

WE22-QI2: Community (stakeholders) involvement and consensus is the key.

WE21-QE1: A big role. They should be the ones to pilot-test them and the ones to actually give the specifications (technically and qualitatively) for their creation. Nevertheless the ***“superficial” approach of some citizens*** can also harm the whole idea.

WE24-QE1: *I don't think citizens are empowered by sensing*, that is a gaslight by the smart city discourse to pretend that citizens have anything to say at all, and to move the responsibility of sensing to citizens.

WE15-QE2: 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.

Fair machines: ICT

WE1-QM1: I don't think autonomous machines can provide fairer solutions. *Ultimately they have to learn from humans.* So any ethical issues around that are eventually ethical issues around humans (who train/own/control those autonomous machines).

WE16-QM1: They can provide fairer solutions if they are deployed fairly.

WE6-QM1: on average, I believe that automated decision making will be less discriminatory than people.

WE8-QM1: Fact-based or rule-based judgement or decision-making, autonomous machines may be fairer (...) and more consistent (...) than humans. **More complex situations**, ..., which normally require human's "intuition", "gut feeling", or "prior experience" in order to make a judgement or decision, **may not be suitable for autonomous machines.**

WE12-QM1: For the ethical problems *humans are responsible NOT technology!*

WE20-QM1: for an autonomous car the liability must be with the car manufacturer if something goes wrong.

WE3-QM2: depends on the application types that are supported and on the objectives that should be achieved.

WE16-QM2: This is a **governance issue**. Even with all the infrastructure and with tons of data about our cities, decisions will always have political aspect. So, it will have to be a combination between *civil society, scientists and policy makers*.

Preliminary analysis

Ways of talking about these technologies, but which are *not necessarily consistent* with each other:

- Scientific
- Civic
- Bureaucratic
- ...

→ Different ways of talking about smart technologies. Every person uses multiple regimes.

Scientific regime

Science is concerned about establishing a semiotic link between representations and reality, e.g. a truth. It cares about tuning devices to be accurate:

We put four sensors together for detecting nitrogen dioxide and ammonia and they give completely different results, but very big differences. We put a sensor that is very very used, that is the dust sensor, the DustDuino project, three or four years old project, that is an Arduino with a Dust sensor for fifteen dollars assigned PPD42NS. In theory, in measurements in one hour it gives very accurate data in relation to big machines, that have been checked: ... there are two papers that look that the machine works. We put four together in the same box in the same light and the same temperature and they were completely different values.

Sensing data is used in the civic regime to give rhetorical force to arguments and thematise, problematise or promote issues in a public debate or court setting:

I6-ICT5: I am not saying Making Sense produced misleading data, right? It was something that was already known, but because the citizens did it again, because it was a bottom-up process, it gave them an extra push to be able to demand from the city and the local government to take some action.

Bureaucratic regime

Expectations and promises about sensor infrastructures echo the principles of bureaucracy as an ideal-type of public administration:

- *efficiency,*
- *rationality,*
- *precision,*
- *reliability,*
- **neutrality.**

Bureaucracy is about establishing procedures for operationalising sensing data and infrastructures.

The political neutrality of bureaucracy is a safeguard of a democratic society, but foregrounds classic tensions between *public participation* and *technical expertise*:

I6-ICT5: I definitely think that code is very intimately related to culture: code is culture. In that sense it can reproduce prejudice that exists. [Do you have an example from the Smart Cities world?] Not one I can think of.

Conclusion

Open questions for the peer meeting

- How *smartness regimes* work as an analytical category for understanding transdisciplinary work?
 - How to improve the *scenario* in which Social Science and Humanities scholars are inserted into the innovation process?
 - How problems of *bureaucracy* and its politics resurface through smart technologies?

`http://slides.metatron.ai/candid/`