RRI Tools – Engagement

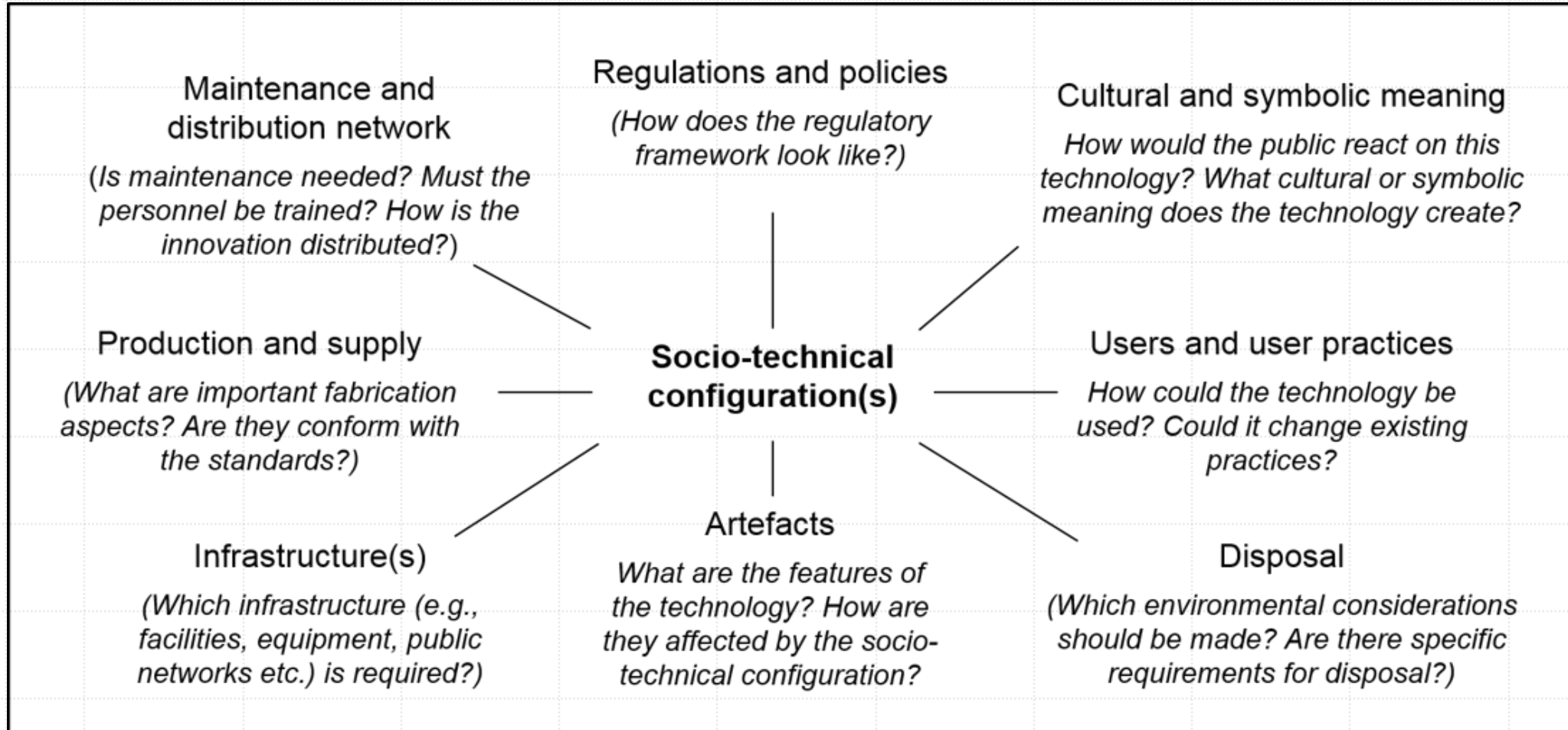## Dependable and Deployable AI for Robotics 2

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The AREA framework for RRI
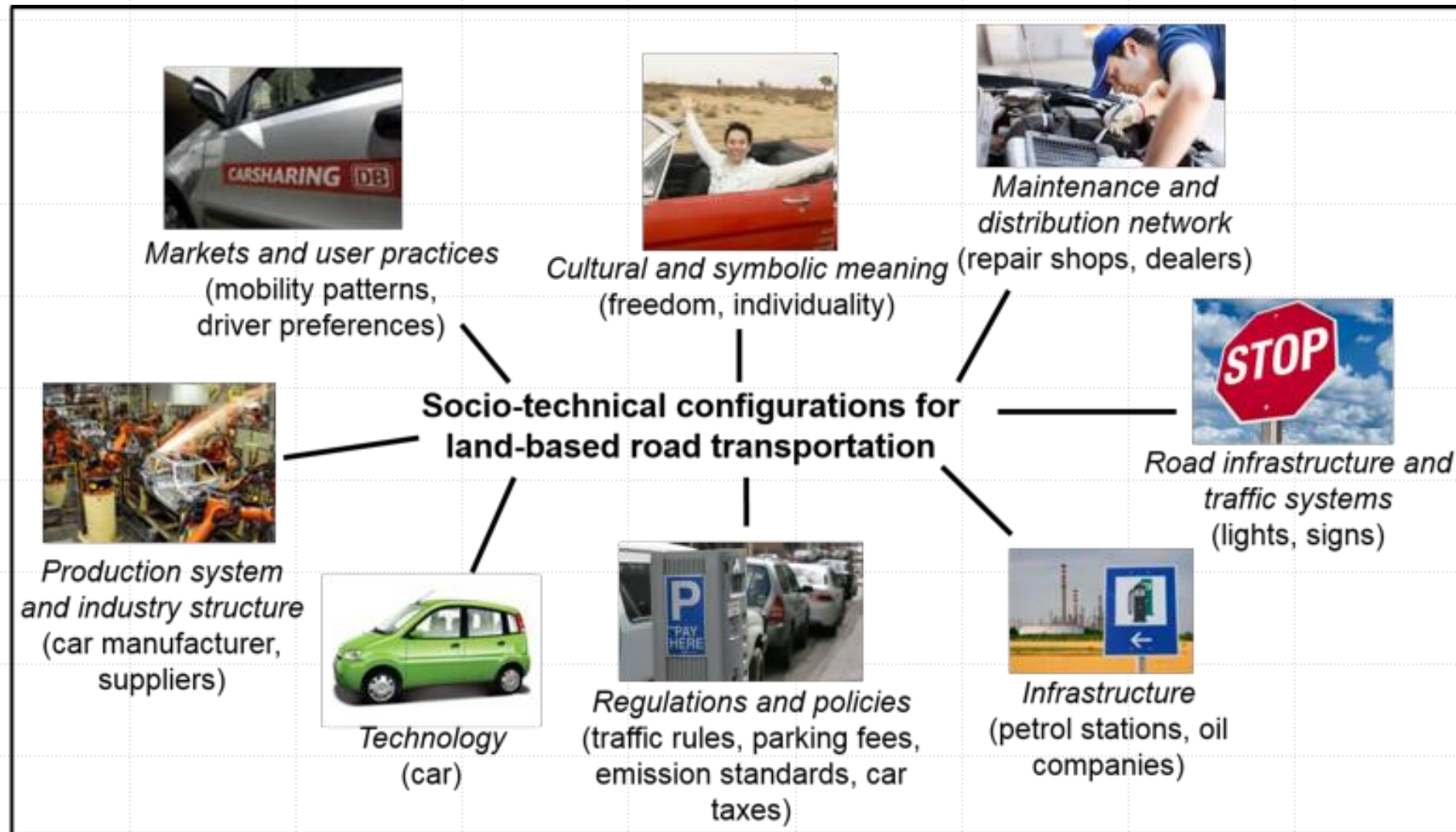
- **A**nticipate outcomes

- **R**eflect on motivation, processes and products

- **E**ngage with stakeholders

- **A**ct responsively

- From https://rai.ac.uk/toolkits/rri-toolkit/ "Engaging with relevant stakeholders. Eventually our work will affect other people, for example as users, consumers, patients or citizens. By involving a broad range of people early in the research and innovation process and allowing them to shape the research we can increase the chances that our work will be both useful and acceptable, and we may avoid a nasty surprise later on (such as a public outcry or newspaper scandal)".

- On Friday we discussed 'Co-creation', with focus on setting up and running a participatory dialogue with stakeholders around the introduction of a (proposed) new technology: what will be useful and what will be acceptable

- We touched on some alternative engagement methods; today we will discuss these in more detail
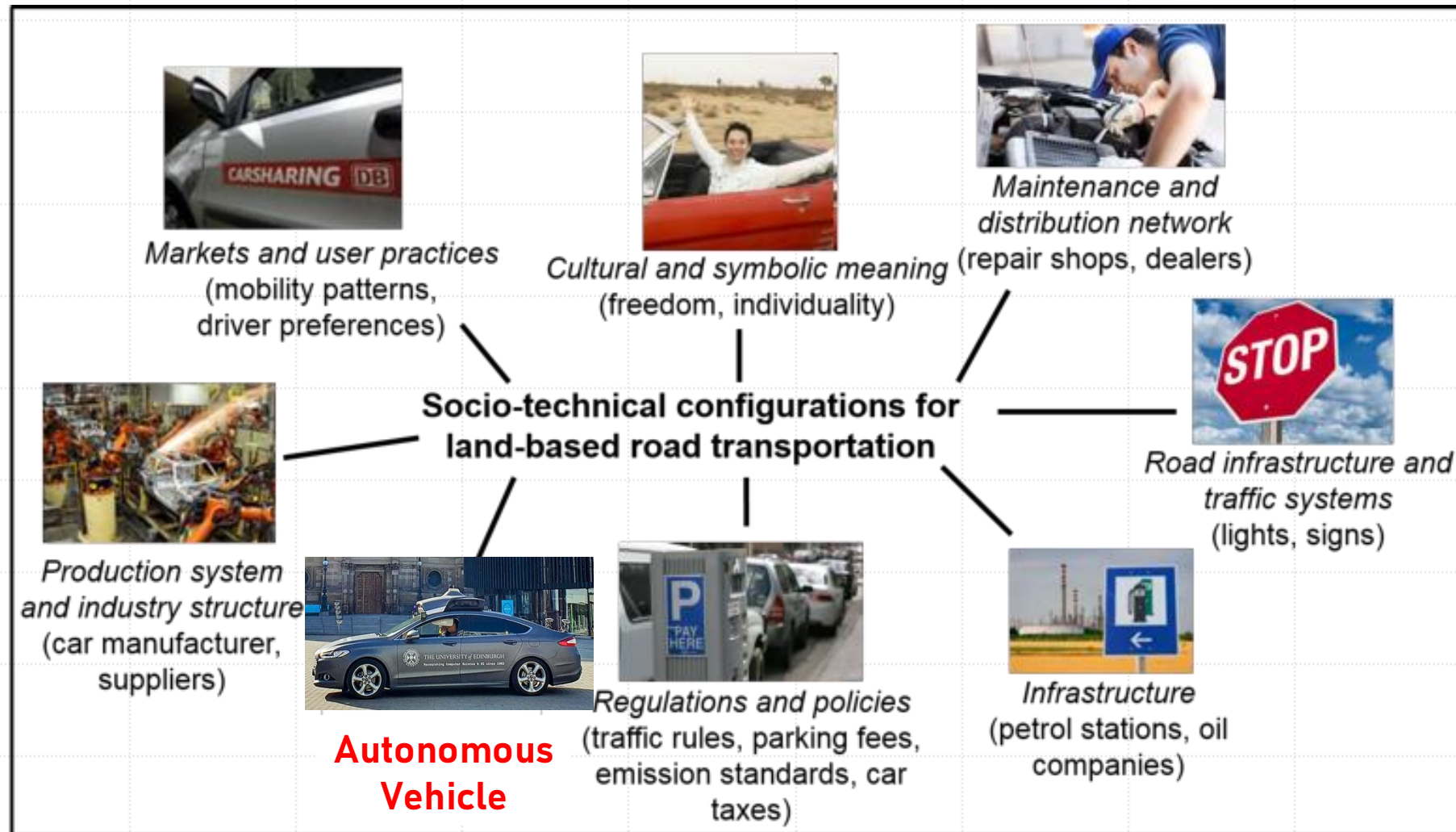
Sociotechnical configuration

https://cta-toolbox.nl/tools/socio-technical-configuration/

Example: the car

Socio-technical configurations for land-based road transportation

Markets and user practices (mobility patterns, driver preferences)

Cultural and symbolic meaning (freedom, individuality)

Maintenance and distribution network (repair shops, dealers)

Road infrastructure and traffic systems (lights, signs)

Production system and industry structure (car manufacturer, suppliers)

Technology (car)

Regulations and policies (traffic rules, parking fees, emission standards, car taxes)

Infrastructure (petrol stations, oil companies)

If we replace the car with an autonomous vehicle, what else will need to change?

Markets and user practices (mobility patterns, driver preferences)

Cultural and symbolic meaning (freedom, individuality)

Maintenance and distribution network (repair shops, dealers)

Socio-technical configurations for land-based road transportation

Road infrastructure and traffic systems (lights, signs)

Production system and industry structure (car manufacturer, suppliers)

Autonomous Vehicle

Regulations and policies (traffic rules, parking fees, emission standards, car taxes)

Infrastructure (petrol stations, oil companies)

Sociotechnical configuration

https://cta-toolbox.nl/tools/socio-technical-configuration/

Exercise:

1) **What is the existing technology your research aims to replace (or augment)?**

   o   What is the broader sociotechnical context of the use of this technology?

   o   Draw a configuration chart for this technology, including: Users; Network of production, supply, marketing; Infrastructure needed to support its function, maintenance and disposal; existing regulations and standards; Cultural meanings and public reactions...

2) **What will be affected or need to be changed if your research is successful?**

3) **Who does this map suggest you should talk to, and at what stage in your research?**

It's good to talk but...

...so is doing good background research.

- What areas do you need to know more about, and how could you find out?

- What engagement studies have already been done, and what were the results?

Other forms of engagement

Field studies

Findings From A Qualitative Field Study with An Autonomous Robot in Public: Exploration of User Reactions and Conflicts

https://link.springer.com/article/10.1007/s12369-022-00894-x

Noticing and keeping distance

Passing

Stopping to watch

Observing (participant was not walking)
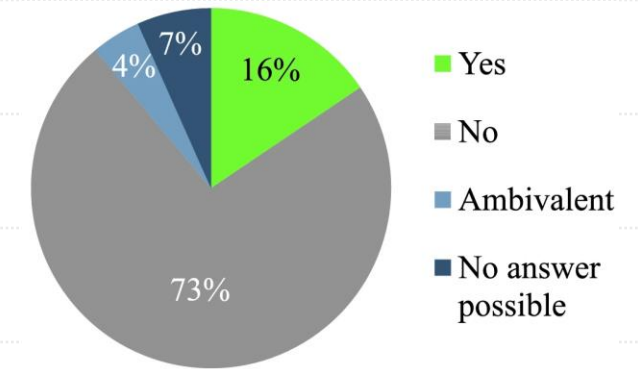
Pointing at robot

Blocking way (with arms extended)

Taking footage of robot

Touching

Other forms of engagement

Interview data. Answers to the question: 'Should the robot assert itself when humans stand in its way?', n = 45

Field studies

Findings From A Qualitative Field Study with An Autonomous Robot in Public: Exploration of User Reactions and Conflicts

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Identified challenges (Table 8)
1) Robot should make current and future actions known, e.g., if it has seen a person and will avoid them
2) Movement could be more predictable, e.g., avoid abrupt turns
3) Inform public about the robot (context, safety)
4) Inform staff about the robot (current deployment)
5) Parental supervision cannot be assumed
6) Speech was not a preferred communication mechanism
7) Interaction strategies are needed when passersby do not realise they are blocking the robot
8) However, 'assertive' strategies need careful design
9) Passersby often actively interact, countermeasures to reduce 'bullying' might be needed

Other forms of engagement

Questionnaires/surveys

- Seem relatively cheap and simple to implement but many possible pitfalls

- Too easy: frequency of requests mean sharply declining response rates

- Patterns of non-response are not random; methods to compensate are available but can be difficult or non-transparent

- Quality of responses uncertain, engagement may be minimal, misunderstanding may occur

- Fixed answer options may limit insight, but open-ended are difficult to code
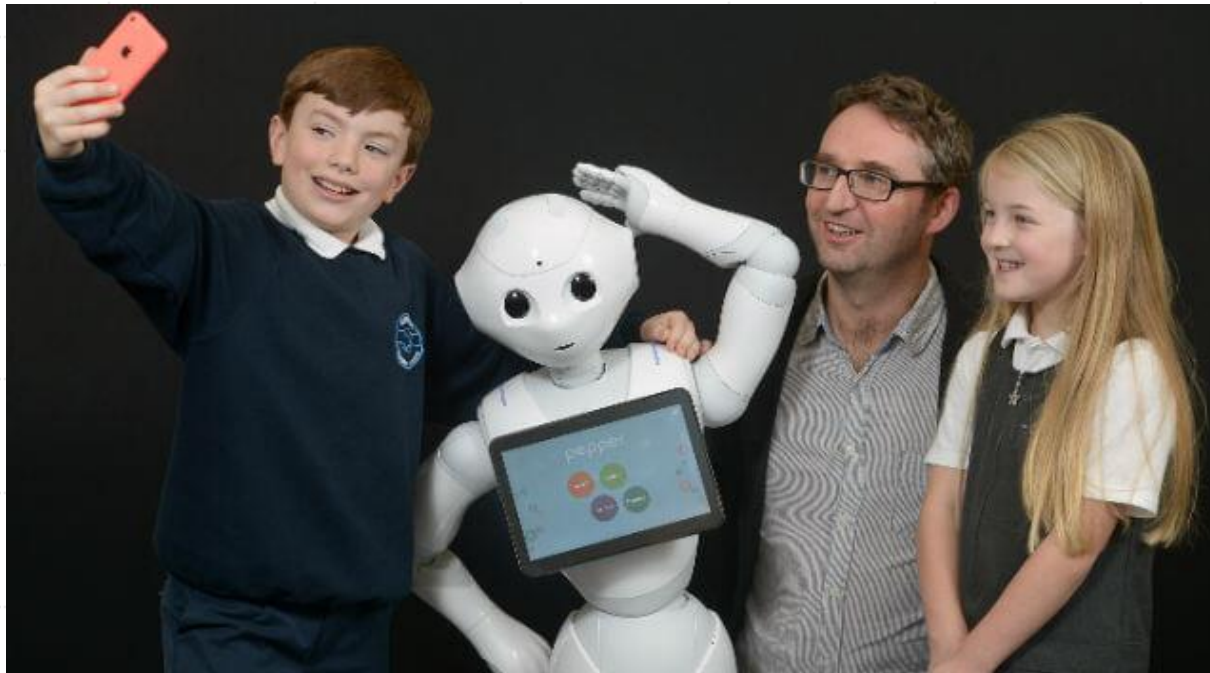
Other forms of engagement

Questionnaires/surveys

- Proper design of a survey itself requires taking a responsible approach

- Clarity on the aims: why is this information being gathered and how will it be used?

- Ethics: participants should understand the purpose; be able to withdraw their data; have confidentiality maintained

- Respondent burden: degree to which participation is perceived as difficult, time consuming or stressful should be minimised

- Can apply Agile & User-centred frameworks to develop the survey:

https://analysisfunction.civilservice.gov.uk/policy-store/questionnaire-design-guidance/

Other forms of engagement

Exercise: brainstorm a public science event based on the successful outcome of your PhD research

https://www.hw.ac.uk/uk/research/engage/year-of-robotics.htm

Other forms of engagement

https://engage2020.eu/publications-page/

- Citizen Science

- Q-methodology, e.g. https://doi.org/10.1016/j.agsy.2022.103466

- Resource-flow mapping, e.g.

- Science Shop – https://www.scishops.eu/

- Serious Gaming

Practical considerations

- What is the right balance of time/effort/money to spend on engagement?

- How can it be efficiently and effectively integrated into a research plan?

- Within a team, how directly should *you* be involved in the engagement processes?

- How should you monitor, assess and report the effect of engagement on your research?