Anticipate

In the AREA-4Ps framework the first key activity is to *Anticipate* the possible outcomes and implications of the work. By considering possible futures we can direct our efforts in the present more carefully and effectively. It is important to consider possible risks, unintended consequences or mis-uses of the work, as well as its intended benefits.

All of the cards in this deck can be used to support anticipation, for example through the prompts or questions on each card. While anticipation and reflection are closely related, in this deck the *Anticipate* cards are broad and forward-looking.

2023-06-06

RI Prompts and Practice Cards

Anticipate

Version 3.1.1 (November 2023)

Intention

Should this work be undertaken?
What benefits will it bring?
Who will benefit?
On what timescale?
How can we measure its impact?

Example actions: 2023-05-16

- Map possible impacts.
- Use existing literature reviews and prioritisation reports, e.g. UN SDGs.
- Solicit a range of lay, expert and peer inputs.
- Involve intended beneficiaries.



Anticipate **Purpose**

RI Prompts and Practice Cards

Anticipate

Version 3.1.1 (November 2023)

Sustainability

How sustainable are the products and the process?
How will they affect animals and plants?
How long will products or outcomes be useful for?
How will this affect communities?

Example actions: 2023-05-08

• Assess direct and indirect environmental impacts.
• Minimise energy and resource consumption.
• Design for long-term use, e.g. repairability.
• Make it self-supporting.
• Plan for product and project “end of life” or continuity.

Anticipate **Product**



RI Prompts and Practice Cards

Anticipate

Version 3.1.1 (November 2023)

People Affected

Considering the outcomes of the work, who would be directly affected, for better or worse?
Who could be indirectly affected?
Who could be left out or excluded?

Example actions: 2023-06-02

• Identify potential stakeholders (see both “Example Stakeholders” cards).
• Include vested interests that may gain or lose out.
• Include indirect and long-term effects.
• Identify potential trade-offs between stakeholders.

Anticipate **People**

RI Prompts and Practice Cards

Anticipate

Version 3.1.1 (November 2023)

Project Risks

What risks might participants, team members or other stakeholders be exposed to?
What other risks are there?
Have these risks been assessed and mitigated?
Are required approvals in place?

Example actions: 2023-06-02

- Follow local policies and best practice, e.g. risk assessment, health and safety, research ethics, monitoring and audit.
- Seek peer and expert input.
- Identify and apply emerging best practice.
- Increase stakeholder involvement.

Anticipate **Process**

RI Prompts and Practice Cards

Anticipate

Version 3.1.1 (November 2023)

Reflect

In the AREA-4Ps framework the second key activity is to pause and *Reflect* on the work, including our own involvement and motivations. A critical interrogation of the work can identify problems and opportunities, allowing us to learn, and avoid wasting time and resources. Ideally this would be done throughout the project.

All of the cards in this deck can be used to support reflection, for example through the prompts or questions on each card. In this deck the *Reflect* cards bring a more reflexive emphasis to the corresponding *Anticipate* cards.

2023-06-08

RI Prompts and Practice Cards

Reflect

Version 3.1.1 (November 2023)

Potential Conflicts

Are there groups or organisations opposed to the work?
Are there reasons NOT to do it?
What legislation and regulation apply?
What will happen if the work is unsuccessful?

Example actions: 2023-06-07

• Evaluate alternative approaches.
• Agree how to handle anticipated objections and whether to approach potential opponents.
• Solicit a range of lay, expert and peer inputs.

Reflect **Purpose**

RI Prompts and Practice Cards

Reflect

Version 3.1.1 (November 2023)

Unintended Consequences

How could the work be used or mis-used?
What negative consequences might it have?
What might happen if it goes wrong?

Example actions: 2023-05-05

• Identify unanticipated outcomes from related projects.
• Consider state, military, and criminal applications.
• Solicit a broad range of lay, expert and peer inputs.
• Design to minimise risk from unanticipated or malicious use.

Reflect **Product**

RI Prompts and Practice Cards

Reflect

Version 3.1.1 (November 2023)

Equality, Diversity & Inclusion

How inclusive are our practices?
How diverse is the team?
How representative are participants and stakeholders?
Are the process and the outputs both accessible?
Is anyone excluded?

Example actions: 2023-06-07

• Conduct an Equality Impact Assessment (EIA) and develop an Equality, Diversity and Inclusion (EDI) action plan.
• Use accessibility guidelines and resources.
• Ensure reasonable adjustments are in place.
• Employ positive action.

Reflect **People**

RI Prompts and Practice Cards

Reflect

Version 3.1.1 (November 2023)

Means of Reflection

What assumptions do we bring to the work?
Does everyone in the project understand RI?
How and when do we make time to reflect?
How do we measure or monitor the work?

Example actions: 2023-06-08

- Reflect on past projects.
- Identify your own priorities, privileges and biases.
- Identify a lead for RI.
- Agree an RI Action Plan and review periodically.
- Convene an advisory board.
- Schedule sessions and agenda items dedicated to RI.

Reflect **Process**

RI Prompts and Practice Cards

Reflect

Version 3.1.1 (November 2023)

Engage

In the AREA-4Ps framework the third key activity is to *Engage* with a diverse range of stakeholders. Engaging with other stakeholders – of all kinds – helps to challenge the assumptions that we hold and gives a more complete understanding of the work and its context.

Engagement is something that can help at *all* stages of a project, including conception. In this deck the *Engage* cards highlight key forms of engagement. There are also two *Instructions* cards which list some “Example Stakeholders” to consider.

2023-06-06

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Public Dialogue

Is the work known to the general public and other groups?
Is it easy to get involved in discussions?
Are the aims of the work acceptable (and to whom)?
Are diverse voices heard?

Example actions: 2023-05-08

- Organise or join public engagement and outreach events.
- Involve organisations representing relevant groups.
- Monitor media coverage of related work.
- Include lay members in advisory groups.

Engage **Purpose**

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Stakeholder Input

How can stakeholders influence the product or outputs?
Are a wide range of stakeholders considered?
When and at what stage?
Does this include people with relevant lived experience?

Example actions: 2023-06-08

• Define objectives and expectations for stakeholder input.
• Convene a user/stakeholder panel or advisory group.
• Employ human-centred design methods.
• Get early and frequent feedback.

Engage **Product**

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Under-represented

Are any groups of stakeholders under-represented, overlooked or excluded?
How can they be included and supported?
Can anyone else represent them?

Example actions: 2023-05-30

- Monitor whether participants and data are representative.
- Identify possible reasons.
- Work with specialist organisations and community leaders.
- Provide material support for people to participate (e.g. travel & child support).

Engage **People**

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Stakeholder Involvement

Can stakeholders have more substantial involvement in the work?
Can they shape the goals or how the work is done?
How is stakeholder involvement supported and acknowledged?

Example actions: 2023-06-07

- Involve stakeholders when defining aims, research questions and methods.
- Give stakeholders substantive project roles.
- Employ co-design or co-creation methods.
- Be flexible, e.g. allow online involvement.

Engage **Process**

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Act

In the AREA-4Ps framework the fourth key activity is to *Act*, that is to use the insights gained from anticipation, reflection and engagement in order to *make a difference* in the work being done. This closes the loop of responsible innovation: ultimately, responsibility can only be discharged through action.

Within the deck, every card includes a number of example actions. These lists are not exhaustive, and there are many other resources and practices available to support responsible innovation. In this deck the *Act* cards look beyond the current project.

2023-06-02

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Shaping the Future

How can we shape a better future for everyone?
How can we reduce inequalities?
What can we contribute to regulation & legislation?

Example actions: 2023-06-02

- Talk to policy makers.
- Respond to requests for evidence from government, regulatory and public bodies.
- Run a publicity or impact campaign.
- Contribute to professional bodies and standards.

Act **Purpose**



RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Openness

How can others build on the work done?
Is support available for this?
Is all relevant information disclosed?
Are publications and reports widely available?
Is data appropriately archived?

Example actions: 2023-06-07

- Be transparent about the work and any products.
- Publish and publicise the outcomes.
- Make data FAIR (Findable, Accessible, Interoperable, Reusable).
- Adopt open licenses.
- Support adoption by others.

Act **Product**



RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Training and Equipping

What training and support do team members need?
How do we help participants and partners to grow and develop?
How do we support formal and informal education?

Example actions: 2023-06-08

- Provide tailored support and training for team members and other stakeholders.
- Develop an education or outreach plan.
- Contribute to local public engagement events.
- Continue to engage with stakeholders afterwards.

Act **People**

RI Prompts and Practice Cards



Version 3.1.1 (November 2023)

Continuous Improvement

What actions can we take throughout this project to improve ourselves, the work and our organisation?
What can we learn from this and previous projects?
How can we support RI more effectively?

Example actions: 2023-06-08

- Share resources and ideas with peers.
- Hold periodic reviews.
- Proactively raise issues at an appropriate level, e.g. project, department, organisation.
- Recruit strategically.
- Champion responsible innovation.

Act **Process**

RI Prompts and Practice Cards



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Discuss again later…

2023-03-01

RI Prompts and Practice Cards

Can you agree?

Version 3.1.1 (November 2023)

Most relevant… and we need to agree some new actions!

2023-03-01

RI Prompts and Practice Cards

Can you agree?

Version 3.1.1 (November 2023)

Most relevant… and we are doing it

2023-03-01

RI Prompts and Practice Cards

Can you agree?

Version 3.1.1 (November 2023)

Less relevant

2023-03-01

RI Prompts and Practice Cards

Can you agree?

Version 3.1.1 (November 2023)

Quick wins: easy and worthwhile

2023-03-01

RI Prompts and Practice Cards

Can you agree?

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+

Add your own concern

2023-03-16

RI Prompts and Practice Cards

Blank

Version 3.1.1 (November 2023)

What is Responsible Innovation?

Responsible Innovation (RI) means doing research and innovation in a way that anticipates how it may affect people and the environment in the future – including unintended consequences – and acting in the present to gain the most benefit, minimise risks and avoid harm. Definitions of RI highlight a range of concerns for researchers and innovators to consider.

These cards [1] are inspired by the AREA-4Ps framework, which highlights four key activities involved in "doing" RI (forming the acrostic "AREA"): *Anticipate*, *Reflect*, *Engage* and *Act*. These are explained on the corresponding cards. The framework also highlights four key areas for consideration ("4 Ps"): the *Purpose* of the work, its *Product* or outcomes, the *People* involved or affected and the *Process* of research and innovation. There is one card for each combination of area and activity.

[1] https://doi.org/10.1145/3597512.3599721

RI Prompts and Practice Cards

Instructions

Version 3.1.1 (November 2023)

Instructions

The coloured cards highlight 4 key activities and 16 different aspects of Responsible Innovation (RI). On the 16 aspect cards, the top half of the card has initial *prompts* for discussion or reflection. The bottom half gives example actions that might be helpful to put into *practice*.

You can use the cards to reflect on a project and plan RI activities accordingly. You can use the cards to facilitate a discussion about priorities for RI in a research or application area. Or do something completely different…

The three white “Exercise” cards suggest specific ways of using the cards. “Exercise 1: Introducing the Cards” is a good place to start if you are new to the cards. There are also two lists of “Example Stakeholders” to consider.

You can use the cards on your own; but the conversations that you have around the cards can be more useful than the cards themselves. So we suggest you use the cards with other people if you can!

RI Prompts and Practice Cards

Instructions

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Exercise 1: Introducing the Cards

This exercise introduces the cards. It can be done in 10 minutes if you are in a hurry.

1: Set aside the black *Can you agree?* and white *Instructions* cards.

2: If you have at least 15 minutes then lay out the remaining (coloured) cards in a grid reflecting the AREA-4Ps framework, i.e. *Anticipate*, *Reflect*, *Engage*, *Act* in one direction (e.g. as rows) and *Purpose*, *Product*, *People* and *Process* plus the relevant activity card in the other direction (e.g. as columns). Alternatively, simply shuffle the remaining (coloured) cards.

3: Take it in turns to choose a card from the deck or the grid.

4: Discuss (or reflect on) your understandings of the card.

5: Discuss (or reflect on) the relevance of that card to your work. If you think that it has no relevance then pause for a moment and consider whether it would be relevant to someone else, or at another stage in the work.

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Exercise 2: Planning a Project

This exercise helps to identify possible responsible innovation issues in a new project. You should allow at least an hour if possible. You may find it useful to take notes, e.g. on a whiteboard, flipchart or using sticky notes.

1: Find the *Anticipate* "Intention" card and briefly discuss the questions on it, i.e. why are you doing the work?

2: Find the *Anticipate* "People Affected" card and both "Example Stakeholders" cards, and identify who might be affected by the work and how.

3: Find the *Engage* "Stakeholder Input", "Stakeholder Involvement" and "Public Dialogue" cards and decide who, how and when you could involve people from outside the project team.

4: Find the *Reflect* "Unintended Consequences" and "Potential Conflicts" and *Anticipate* "Sustainability" and "Project Risks" cards and identify any specific responsibility challenges for your work.

5: Combine your discussions and reflections to create an initial RI Action Plan to tackle the challenges identified.

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Exercise 3: Can you agree?

This exercise helps to identify priorities and plans for responsible innovation in a specific project. It is best done with other members of the project team, and perhaps a "critical friend". It is likely to take around an hour, and can be repeated at different points within the project.

1: Lay out the five black *Can you agree?* cards face-up.

2: Set aside the white *Instructions* cards and briefly familiarise yourself with the remaining (coloured) cards, for example laying them out in a grid reflecting the AREA-4Ps framework (see "Exercise 1").

3: Work through the (coloured) aspect cards as a project team, placing each one next to the most appropriate *Can you agree?* card.

4: Starting with the example actions on the cards next to "Quick wins" and "Most relevant… and we need to agree some actions", discuss and agree what to do next.

RI Prompts and Practice Cards

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Example Stakeholders (1)

These are just some examples; try to think broadly…

Beneficiaries (directly affected)
• An intended beneficiary.
• A person with a health condition, impairment or learning difference.
• A person with little or no access to money or technology.
• A member of a minority or under-represented group.

Supporters (directly and indirectly affected)
• The family and friends of an intended beneficiary.
• An employee who has to make it work.
• The person or organisation paying for it.

Onlookers (responding)
• An “ordinary” member of the general public.
• A reporter for a popular news channel.
• A government policy advisor or decision-maker.

RI Prompts and Practice Cards

Instructions

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Example Stakeholders (2)

These are just some examples; try to think broadly…

Bystanders (indirectly or unintentionally affected)
• An innocent bystander.
• A person who has lost their job because of it.
• Someone who is alive in 20 years time.
• A person living in vulnerable conditions.
• The natural environment (including animals and plants).

Exploiters (affecting others)
• Another researcher or technologist in the near-future.
• A large company that wants to make money from it.
• An armament or defence company.
• The police or national security organisation.
• A tech-savvy criminal.
• An enemy state or terrorist.

Other (add your own…)

RI Prompts and Practice Cards

Instructions

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Credits

These cards have been developed by the Horizon Digital Economy Research Institute at the University of Nottingham in collaboration with the Trustworthy Autonomous Systems Hub, supported by UKRI [grants EP/T022493/1 and EP/V00784X/1]. They are based on the AREA-4Ps Framework for Responsible Research and Innovation in ICT [1], with refinements, additional questions and possible actions as described in [2].

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Search: “RI Prompts and Practice Cards”

[1] https://doi.org/10.1145/3064940
[2] https://doi.org/10.1145/3597512.3599721

RI Prompts and Practice Cards

Instructions

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Talk to us!

If you have used the RI Prompts & Practice cards then we would love to know what you did with the cards and what effect this had on your work. The survey should take 10-15 minutes and will help us to promote the cards and responsible innovation.

As a “thank you” we will send a set of cards to the first 100 respondents.

www.nottingham.ac.uk/research/groups/mixedrealitylab/projects/ri-cards.aspx



RI Prompts and Practice Cards

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