

RESPONSIBLE INNOVATION PROJECTS

Professional Practice 2

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Australian
National
University

Responsible Innovation Project assessment task is designed to develop students professional skills and competencies as engineers and computer scientists through a real world industry challenge. Each workshop group is allocated a different innovation project to work on. These large groups of around 30 students will work in diverse teams (4 members) to communicate effectively and solve the industry challenge, transferring complex knowledge and ideas to technical and nontechnical audiences. Students will work on Responsible Innovation Project in the Workshops.

Workshops is delivered in flipped mode.

This means students will need to complete the readings, videos, activities, exercises and the associated weekly quizzes before attending the workshops.

To prepare for workshops, view the weekly lesson and check your understanding of the content by attempting the quiz questions. The workshops will then be a great place to practice and apply the relevant theories together with your peers and facilitators. This will also provide students with an immediate opportunity for feedback through active learning, solidifying their development of their Responsible Innovation Project work and associated professional skills and competencies.

Facilitators work with you during the workshops to ensure your projects are on the right direction and progressing well.

On Week 11, you need to submit all you produced throughout the semester. This includes:

Task	Details	Submit
Project Repository	Set up and maintain project repository team sites	N/A
	Prepare team charter	Week 2
Handover documents and files (40%)	White Paper Report (15%)	Week 11 (22 Oct)
	Project Presentation (10%)	Week 12 (28 Oct)
	Podcast (15%)	5 Nov 2021
	Individual reflective piece (10%)	8 Nov 2021
Workshop contribution (5%)	Workshop contribution (5%)	Week 1-12

1. White Paper Report

Groups will be required to submit a copy of a white paper report in Week 11 (access a template for this document on Wattle). This is different from reports or articles you usually write. A white paper is an authoritative report, usually created to educate the reader. They delve deep into the subject of study, by offering a broad analysis. A good white paper will outline its purpose from the outset to evaluate the issues

surrounding the set topic within a given context, highlight the challenge, and deliver a solution.

A white paper report should contain key takeaways and its structure should be as clear as possible, with a title page, an easy-to-read table of contents, an overview of the problem that will be addressed, solutions to the problem and a conclusion.

- ☐ **Cover page:** professional-looking, immediate information on the content of the white paper
- ☐ **Title:** Grab the reader's attention with a smart, snappy title.
- ☐ **Table of Contents**
- ☐ **Abstract:** Explain the premise of the white paper in a brief executive summary.
- ☐ **Problem statement:** Describe the problem and the challenge you aim to address.
- ☐ **Background:** Provide information and data related to solving the problem.
- ☐ **Solution:** Identify the solution.
- ☐ **Conclusion:** Neatly finish the paper with a restatement of the key takeaways.
- ☐ **References:** Include all the references and sources you used in your research project.

Students can use the template for white paper uploaded on Wattle.

Challenge Assessment

- What are the key words in the project challenge? Evaluate the most recent articles and news in the field related to these key words, themes, topics or concepts.
- What are the recent innovations that relate to your project challenge? They could be technological, behavioural, or cultural. What is the edge needed for your research or solution?

- Take a look at other solutions relating to your project challenge. Which ones worked? Which ones didn't? Are there any that feel similar to what you propose to investigate as part of the research design? Any solutions that have inspired you to possibly use or adapt?

Situation assessment

- Include a description of the relevant environmental conditions affecting the

client business, including relevant statistics, trends, competitors, etc (macro level)

- Who is the client base? Outline the trends, relevant statistics and information relevant to the project. (micro level)
- Assess how the business needs in relation to the project challenge are

currently being met (strengths) or not met (weaknesses). What can be improved?

- Analysis of the gap between the current situation and the stated objective(s). What opportunities does this create?

2. Project Presentation

Each group presents a 10-minute presentation that responds to team project work (Week 12).

Students to submit 1 copy per project team to case-study project presentation link via Wattle:

- 1 x PDF/PPT version of your presentation

Your workshop facilitator will check the uploaded docs and liaise with the team representative if there is any need for follow up regarding the doc submissions before your workshop session.

3. Podcast (15%)

Each group produce a Podcast from your learning journey about the project.

Students are encourage to use your maximum creativity in podcasting by engaging with the topic aurally and orally. By engaging the senses more deeply, they can also gain a more comprehensive understanding of the topic.

Students figure out the structure of the episode in their group discussion and decide how to incorporate music and other audio to make it more engaging. They can use different styles (e.g. the

conversational, journalistic, etc) to think outside the box in terms of presentation.

We encourage students to check Radio services like NPR and the BBC to find good examples of engaging, informative programming for your podcast.

The podcast should contains a solid **10 minutes** of good content that delivers on its title and engages the audience with the message and story about the project.

On-campus students can use [CPAS Podcast Studio](#). The Studio is set up as a four mic desk (expandable under certain circumstances to six mics). They've got mics, memory cards, a multi-track recorder and the desk and the room. All you'll need to bring is yourselves (and a computer to edit and

upload). There are always people around to provide advice and guidance, on story-telling, brand, recording techniques and sound engineering - or anything else you're wondering about. For that you can reach out to Will Grant (will.grant@anu.edu.au) to chat about how it'll work and [how to book](#).

4. Individual Reflective Piece (10%)

In this assignment students will work individually to write a reflective piece (<700 words) about their personal journey during complementing the 'responsible innovation project'. The assessment provides them with a way of evaluating skills and competencies on a project that they have been involved throughout the semester. This is very similar to 'career episode piece' assignment in PP1.

The assignment provides students with an opportunity to develop reflexivity about their own practices and learning, and to develop succinct reflective

writing capability. Such a skill is particularly important for job readiness, including in formulating effective job applications. This assignment helps students to improve their skills in writing, including refining, structuring and presenting your position and argument.

Please ensure in the reflective piece answers the following question:

- What does it take to be responsible when you develop a solution to a problem?



**Innovation and the
future of biodiversity
monitoring**

WORKSHOP 01

Workshop time: Thursday 12:00-14:00

Workshop Facilitator: Chitresh Saraswat

PROJECT TITLE

Making it easy and meaningful for people to volunteer for nature

About

Volunteers are important to biodiversity monitoring and conservation, and the number of people willing to contribute their free time working to protect nature in Australia is already high. For example, there were an estimated 100,000 Victorians volunteering for nature, according to the Department of Environment, Land, Water and Planning [1]. Even so, increasing the number and diversity of community members participating in environmental monitoring and conservation is key for addressing pressing issues such as pollution, climate change, biodiversity loss and environmental justice.

Digital technologies present an opportunity to increase participation in environmental monitoring [2], in programs that are often called “citizen science” (CS). Some of the promises of digital technologies in citizen science is that they can increase the number of participants (because of the ease of participation) and the quantity of data collected, as well as improve data quality. In Australia, biodiversity monitoring and conservation programs use different digital technologies -such as smartphone apps and online platforms- for communication with volunteers, data capture and data analysis. However, a number of strategic citizen science documents developed recently in New South Wales, Queensland and Victoria, as well the “Australia Strategy for Nature 2019-2030”, highlight a number of needs that could be covered with state-wide or nation-wide environmental volunteer platform.

Challenge

Different strategic citizen science documents in Australia have highlighted common needs. The need for: (1) a single portal that list all citizen science programs to encourage people to find the best option for them and sign up as a volunteer; (2) transparency of project outcomes and impact; and (3) open access to data generated through these programs [see 3,4,5].

The project challenge is to:

- Find and analyse existing cases of nation-wide platforms for citizen science and environmental volunteers [6],
- review arguments around opportunities and concerns of designing a nation-wide and/or state-wide environmental volunteer platforms (e.g. privacy concerns), and
- given the needs identified by the strategic documents, as well as the opportunities and concerns previously found (in point 2),
 - to design improvements for already existing platforms in Australia, or
 - to propose the design a new environmental volunteer platform in Australia.

Project Process

Time commitment

Students are expected to commit 3-4 hours per week on this project.

Following the design thinking framework, project teams will typically engage in these tasks over the semester.

Empathise

- Conduct an initial review to determine and define needs and expectations from citizen science platforms in Australian (and other countries); look into their missions and visions and which aspect are highlighted in developing a platform.
- Understand the context, the key stakeholders involved in designing and developing a nation-wide platform for citizen science and environmental volunteering.
- Conduct a review to determine the main key social, ethical, and technical concerns around the design and implementation of digital citizen science projects.
- Analyse the available data regarding the existing platform design, people's attitude, applications, regulatory concerns etc.

Ideate and prototype solutions/recommendations

- Design improvements for already existing platforms in Australia, or
- Propose the design a new environmental volunteer platform in Australia using responsible innovation principles.

The recommendations/outcomes of the project need to:

- Demonstrate your responsible thinking and practice.
- Align with best practice.
- Fit within the ANU policy framework, security and privacy guidelines.

Opportunities

- Students may volunteer or continue to work on the project in an unpaid capacity at the end of the semester.
- Students may be accepted to join ANU Responsible Innovation Lab
- The Project could be showcased on the Lab's website, and team member are invited to present the project in a Webinar on Responsible Innovation on Dec 14, 2021.



Innovation and the future of aboriginal governance

WORKSHOP 02

Workshop time: Thursday 15:00-17:00

Workshop Facilitator: Chitresh Saraswat

PROJECT TITLE

Enabling indigenous innovations to solve the Australian bushfire crisis

About

Australia is not new to bushfires. In dry periods, large swathes of land are engulfed in bushfires and grassfires. Between 1967 and 2013, major Australian bushfires costed several fatalities and A\$4.7 billion in direct and indirect economic losses [\[1\]](#). Latest bushfire incident in 2019-20 was etched in our memory as one of the worst bushfires in recent history. More than 97,000 square kilometres (18 million football fields) of land experienced multiple large-scale and intense fires, predominantly in the southern and eastern part of Australia [\[2\]](#). Moreover, the 2019-2020 mega-fires pushed many species towards extinction, and several others are highly vulnerable. Latest evidence suggests that climate change has aggravated the bushfire risk, and it will continue to intensify along with record-breaking droughts and heatwaves. The rising temperature and dryness will be lengthening the bushfire season [\[3\]](#)

Climate change, drought and existing land-use management will continue to threaten and exacerbate the Australian bushfire crisis. To minimize future damage, fatalities, economic losses, and biodiversity losses, we need to rethink how we manage our land and fire. For thousands of years, the Aboriginal people of Australia systematically managed land and fire. They used fire across Australia, and in some areas this created expansive grassland on good soils that in turn encouraged kangaroos to come and were later hunted for food. Historians and researchers believe selecting what areas to burn, when, and how often, was part of Indigenous knowledge of the land. The result was a mosaic of trees and grasslands that meant the highly combustible Eucalyptus forests were not likely to create intense bushfires.

Challenge

For more than two centuries, indigenous practices were dismissed as primitive and pushed into the margins. Thanks to the scholarly work of Bill Gammage [\[4\]](#), Victor Steffensen [\[5\]](#) and others, many academics, activists and policymakers started to realize the benefits of indigenous land management practices.

Across Australia there are a number of groups that encourages farmers and Indigenous people to work together to adopt land management practices closer to those used by Australia's first inhabitants. While the use of fire is not the only tool, it is one the Indigenous community can share.

The interesting question here is: how can we combine traditional practices with modern technological tools to make Australian land resilient? What's the role of new technologies in enabling an aboriginal governance to solve Australian bushfire crisis?

Project Process

Time commitment

Students are expected to commit 3-4 hours per week on this project.

Following the design thinking framework, project teams will typically engage in these tasks over the semester.

Empathise

- Conduct an initial review to determine and define needs and expectations from citizen science platforms in Australian (and other countries); look into their missions and visions and which aspect are highlighted in developing a platform.
- Understand the context, the key stakeholders involved in designing and developing a nation-wide platform for citizen science and environmental volunteering.
- Conduct a review to determine the main key social, ethical, and technical concerns around the design and implementation of digital citizen science projects.
- Analyse the available data regarding the existing platform design, people's attitude, applications, regulatory concerns etc.

Ideate and prototype solutions/recommendations

- Design improvements for already existing platforms in Australia, or
- Propose the design a new environmental volunteer platform in Australia using responsible innovation principles.

The recommendations/outcomes of the project need to:

- Demonstrate your responsible thinking and practice.
- Align with best practice.
- Fit within the ANU policy framework, security and privacy guidelines.

Opportunities

- Students may volunteer or continue to work on the project in an unpaid capacity at the end of the semester.
- Students may be accepted to join ANU Responsible Innovation Lab
- The Project could be showcased on the Lab's website, and team member are invited to present the project in a Webinar on Responsible Innovation on Dec 14, 2021.



Innovation and the Future of Augmented Reality

WORKSHOP 03

Workshop time: Thursday 16:00 -18:00

Workshop Facilitator: Felicity Millman

PROJECT TITLE

Responsible Hololens

About

Augmented Reality is one of the most exciting technologies today, and is going to be the next generation of compute, for both enterprise and day to day customers. Virtual Presence is one of the amazing applications of such technology, allowing people to connect, collaborate, and communicate without the physical barriers. Technologists believe there is no limit to what these technologies can unlock. They argue we will wear very small AR, VR, and MR (mixed reality) headsets in the near term, probably not very different from the glasses we wear today.

These new technologies will allow us to use them everywhere, every time, the way we use our phones now. This technology can definitely improve our lives in many aspects. For example, visually impaired people can have a detailed sense of the environment in real-time with a pair of AR glasses. Doctors in remote areas can benefit from a seamless collaboration with experts around the world when performing a surgery. We all can fix our cars by ourselves as our AR glass provides us with every information we need when we look at our car.

The [Hololens](#) is Microsoft's take on augmented reality. It's the most popular version of dedicated to augmented reality to hit the market to date Using multiple sensors, advanced optics, and holographic processing that melds seamlessly with its environment. Holograms can be used to display information, blend with the real world, or even simulate a virtual world.

Challenge

As useful as products such as Hololens can be for humanity, there are a considerable number of social, legal, and ethical challenges faced by developers, researchers, and marketers in terms of creating, deploying and using these technologies. For example, the main ethical challenges in terms of AR implementation include facial recognition and anonymity, privacy, mental and social side effects, unrealistic expectations, reality distortion, and manipulation [1]. There are nuanced trade-offs around the wearer of AR/VR products and those who find themselves in their field of vision, and that these tradeoffs account for the impact on vulnerable communities.

There are also legal considerations to take into account. Currently, there is no regulatory infrastructure in place to moderate the development and deployment of AR technologies in general and Hololens in particular. And this is mainly because the speed at which AR technology is advancing is too fast for the traditional legislative system to account for.

The project challenge is to identify the ways we can make the design and development of Hololens more responsible.

This includes: reviewing the ethical, social and legal concerns relating to AR in general, and to look into design of Microsoft Hololens to find the underlying assumption about the human's autonomy an agency within it; also reviewing technical and social challenges of Hololens with a focus on the people involved in the system, identifying stakeholders of the system as well as their values, investigating the requirements of the system and comparing them with stakeholders' values.

Project Process

Time commitment

Students are expected to commit 3-4 hours per week on this project. Following the design thinking framework, project teams will typically engage in these tasks over the semester.

Empathise

- Conduct an initial review to determine and define needs and expectations from Hololens.
- Understand the context, environment and requirements in which Hololens is designed and built.
- Conduct a review to determine the main key social, ethical, and technical concerns around Hololens design and application.
- Analyse the available information/data regarding Hololens' design, people's attitude, etc.

Ideate and prototype solutions/recommendations

- Recommendations for new or improved design and implementation.
- Recommend activities that manufacturers can do to move towards a more responsible development of AR technologies, in particular Hololens.
- Recommendations for addressing social, ethical, and legal concerns.

The recommendations/outcomes of the project need to:

- Demonstrate your responsible thinking and practice.
- Align with best practice.
- Fit within the ANU policy framework, security and privacy guidelines.

Opportunities

- The project could be presented to the Microsoft Research Lab team at Cambridge, UK.
- The project could be presented to the faculty of Information Systems at the University of Sheffield, UK.
- Students may be accepted to join ANU Responsible Innovation Lab
- The Project could be showcased on the Lab's website, and team member are invited to present the project in a Webinar on Responsible Innovation on Dec 14, 2021.
- Students may volunteer or continue to work on the project in an unpaid capacity at the end of the semester.



**Innovation and the
Future of Development**

WORKSHOP 04

Workshop time: Thursday 19:00 -21:00

Workshop Facilitator: Felicity Millman

PROJECT TITLE

Responsible Innovating in and for the Global South

About

Increasingly, UN agencies and other NGOs are leveraging emerging technologies - like AI and blockchain - to develop and iterate new solutions to issues faced by societies in the [Global South](#). Initiatives like the World Food Program's Innovation Accelerator and community efforts like Techfugees are trying to use technology to create and collect solutions for wicked problems of displacement, hunger and poverty.

For example, Techfugees aims to nurture an ecosystem of tech innovations designed by, with and for displaced people [1]. Programmers, engineers, entrepreneurs, NGOs and startups have all come out in support of Techfugees, to create strategies and find meaningful long-term solutions to the crisis. Another example is the United Nations World Food Programme Innovation Accelerator. It's an initiative that sources, supports and scales innovations to achieve Zero Hunger [2]. In fact, these two examples and many other similar initiatives such as hackathons and open-innovation events are organized everyday across the world to support projects particularly by, with, and for the people in the global south. They encourage entrepreneurs and engineers to come up with new solutions, in order to scale the promising innovations. They leverage unprecedented advances in digital innovation—such as mobile technology, artificial intelligence, big data and blockchain—and new business models to transform the way we serve vulnerable communities across the world.

Challenge

Social good hackathons, and global initiatives that support using tech-solutions are increasingly springing up in and for the developing countries, breathing new life into the concept of innovation in those cultures. However, many of these innovations undermine the indigenous knowledge and the ways of looking. Instead, they tend to trial the use of new advanced tools on populations with few other choices. This has posed ethical challenges for the people who want to use technology for social good. **The key challenge in this project is find a way to ensure the tech solutions in less developed countries are responsible**—where there may not be infrastructure to provide alternatives or solutions to any unexpected problems. And if we cannot ethically innovate for or with populations in the Global South, how can we best develop solutions to these problems in a responsible and relevant way?

Project Process

Time commitment

Students are expected to commit 3-4 hours per week on this project. Following the design thinking framework, project teams will typically engage in these tasks over the semester.

Empathise

- Find and analyse existing cases of platforms empowering vulnerable communities across the world by technology (platforms like Techfugees and WFP Innovation Accelerator) ; analyse the successful projects to understand which kind of innovations are mostly desirable by the funding agencies.
- Understand the context, environment and requirements in which initiatives such as Techfugees or hackathons and open-innovation events operates.
- Conduct a review to determine the main key social, ethical, and technical concerns around design and application of Tech-innovations in the developing countries.
- Select one initiative (e.g. hackathon, institution, etc.) and go through the abovementioned process for that particular initiative. For example, if your group find a specific hackathon in Kenya interesting, find and analyse all relevant information about that Hackathon.

Ideate and prototype solutions/recommendations

- Recommendations for new or improved design and implementation of Tech-accelerators in developing countries
- Recommend activities that ensure the tech innovations in less developed countries are responsible
- Propose a new design for the selected initiative drawing on the challenges and opportunities identified in the previous sections.

The recommendations/outcomes of the project need to:

- Demonstrate your responsible thinking and practice.
- Align with best practice.
- Fit within the ANU policy framework, security and privacy guidelines.

Opportunities

- The project could be presented to the faculty of Information Systems at the University of Sheffield, UK.
- Students may be accepted to join ANU Responsible Innovation Lab
- The Project could be showcased on the Lab's website, and team member are invited to present the project in a Webinar on Responsible Innovation on Dec 14, 2021.
- Students may volunteer or continue to work on the project in an unpaid capacity at the end of the semester.