Toolkit portfolio (20%)
Develop tools for responsible thinking/practice

If you are a creative person, this is a space reserved for you to shine.

Use your skills in the group and discuss how you can develop **two tools** that other engineers and computer scientists can use to be more responsible in their thinking and practice.

The tool potentially enables the user to think critically and holistically about the technical systems they are involved in as an engineer. It could be a game, framework, guideline, team-based activity, qualitative/quantitative technique, etc.

> Note: You can submit 'one' tool for this assignment if the tool requires too much time to be developed. You can check this with your tutor.

For inspiration, you might look at three tools that Microsoft has recently developed and released for responsible innovation in May 2020. According to Microsoft the tools provides practitioners with a set of practices for anticipating and addressing the potential negative impacts of technology on people. See the tools here: https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/

Once you've created your tools, it's time to develop **a landing page** to tie it all together, and host your creations. The landing page will make it easier for others to use your tools and learn about responsible thinking and practice from your team's perspective.

Example 1: Judgment Call (Microsoft)

Microsoft develops a team-based activity to put Microsoft's **ethical principles** into action—includes fairness, privacy and security, reliability and safety, transparency, inclusion, and accountability. In this game, players have to exercise their analytical thinking by applying those principles to real-world technology scenarios. In other words, the ultimate goal is to provide Microsoft people with an easy-to-use method for to understand stakeholders, their needs and expectations, and potential outcomes, like how a product or technology could help society—or cause harm (i.e. cultivating stakeholder empathy by imagining their scenarios).

Example 2: Wat-A-Game (IRSTEA, France)

WAT-A-GAME (WAG) is an open toolkit and a method based on simple bricks and a supporting software for designing and using participatory simulations (i.e. role playing games) for water management, policy design and education. It can be easily used for different stakeholder-based problem, at different scales and for various water related issues.WAG can be used in any place, with, and between, all stakeholders, farmers, citizens, experts, administration, policy makers, etc.

It shows explicitly how water flows, how it is polluted, transformed, shared, and used. Participants can choose how they take water, use it, and give it. They can decide among various actions or strategies for themselves and the community, with consequences on their household economy, their satisfaction, labour, and the surrounding ecosystems. Meanwhile, new policies can be invented and tested in the group discussion. For more see here: https://sites.google.com/site/waghistory/. Also here are examples when it's used as a tool for participatory natural resource management: https://cgspace.cgiar.org/bitstream/handle/10568/33681/NBDC_Brief13.pdf?sequence=1&isAllowed=y , https://uneseuleplanete.org/Wat-a-Game

Example 3: Teaching ethics with games (Harvard Center for ethics)

You can use game design principles to create fun and effective learning experiences for those interested in learning ethics. Games are fun and people spend lots of time of effort playing them.

- Teaching Ethics with Games - Episode 1. The Golden Rule [Link]
- Teaching Ethics with Games - Episode 2. The Magic Circle [Link]

Example 4: Harms Modeling (Microsoft)

Harms Modeling is a framework developed by Microsoft for product teams, grounded in **four core pillars** that examine how people's lives can be negatively impacted by technology: injuries, denial of consequential services, infringement on human rights, and erosion of democratic & societal structures. Harms Modeling enables product teams to anticipate potential real-world impacts of technology, which is a cornerstone of responsible development. For more see here: https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/harms-modeling/

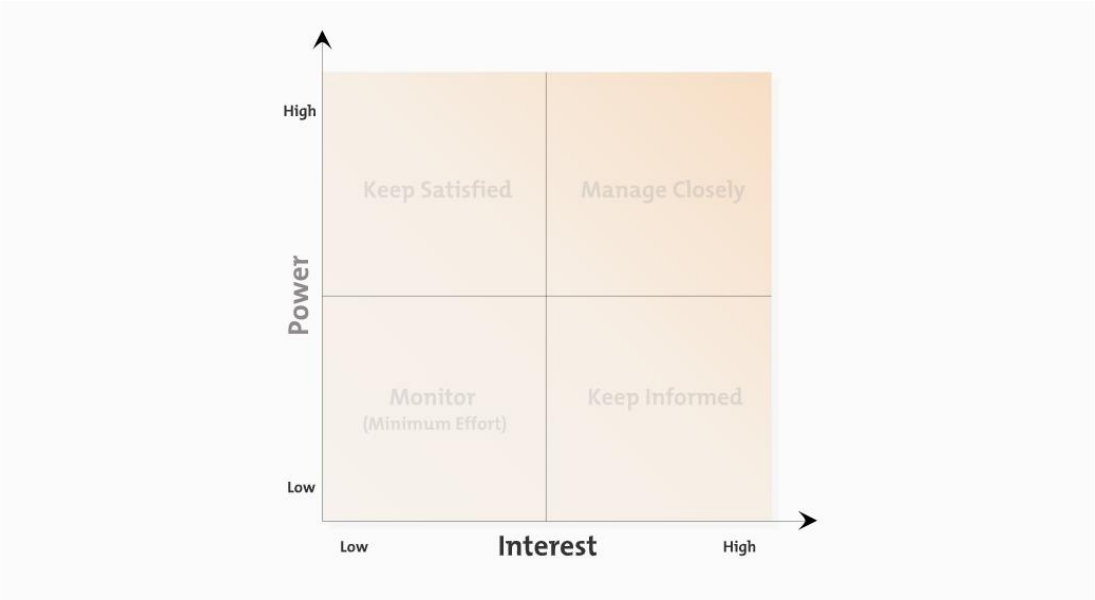
CATEGORY	TYPE OF HARM	CONTRIBUTING FACTORS	Severity	Scale	Probability	Frequency	POTENTIAL
Risk of injury	Physical or infrastructure damage			▼	▼	▼	LOW
	Emotional or psychological distress		▲	■	▲	▲	HIGH
Denial of consequential services	Opportunity loss			▼	▼		LOW
	Economic loss			▼	▼	▼	LOW
Infringement on human rights	Dignity loss		■	▼	■	▼	MODERATE
	Liberty loss		■	▼	▼	▼	LOW
	Privacy loss		▲	■	▲	▲	HIGH
	Environmental impact			▼	▼		LOW
Erosion of social & democratic structures	Manipulation		▲	■	■	▲	HIGH
	Social detriment		■	▼	■	▼	MODERATE

NOTE: This summary represents the outcome of a qualitative assessment and is used to inform prioritization of responsible innovation mitigations.

Example 5: Interactive Stakeholder Analysis App

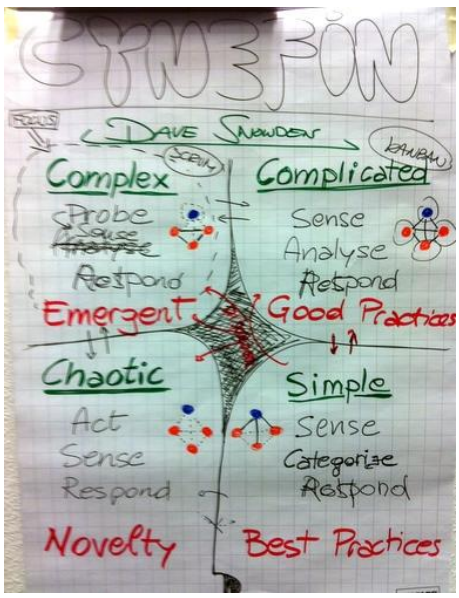
You can develop interactive tool to be used for Stakeholder Analysis for your projects. Two examples for your inspiration:

- https://www.mindtools.com/pages/article/newPPM_07.htm#Interactive
- https://www.mybeeye.com/management-tools/stakeholder-analysis



Example 6 : Cynefin Lego Game (agile42)

A game to let you experience four of the five domains of Dave Snowden's Cynefin framework. It is developed by agile42. Using Lego, you go through four exercises where the problem to solve and the context you work in is designed to create a simple, complicated, complex and chaotic system. While it does not introduce you to the full potential of the sense-making framework, it is well suited to get a first impression and raise interest in learning more about it! Although Cynefin is at the heart of this exercise, the debriefing focuses on outcome that is not necessarily part of the model. For more see here: https://www.agile42.com/en/cynefin-lego-game/



Example 7: A tool for developing responsible innovation in start-up enterprises (Long et al., 2019)

The responsible management of innovation (RMoI) tool aims to provide innovators with a systematic way to identify and consider socio-ethical risks and opportunities. To do this, the RMoI tool builds on the concepts of responsible management, RI and incorporates an existing approach, the Product Impact Tool. The tool can enable a full learning cycle and provide a method to identify socio-ethical factors in responsible innovation. For more read here: https://www.tandfonline.com/doi/full/10.1080/23299460.2019.1608785