Case Studies : Safety 2

Proposed Answers

Case 1: Edge Cases - How artificial intelligence is transforming professional meetings

Scenario
As a software engineer developing cutting-edge solutions for the future workplace, your goal is to seamlessly connect workers with their colleagues for effective collaboration, regardless of their location, device, or time zone. Your role involves redesigning the digital workspace to foster seamless interaction and collaboration among team members.

To achieve this, you have enhanced virtual meetings to replicate the immersive experience of in-person interactions. You have implemented advanced camera setups that leverage AI to detect who is speaking and where they are facing. This ensures that virtual participants always see the speaker's face, even when they turn towards a whiteboard or someone in the room. Additionally, AI streamlines meeting tasks such as transcription and scheduling follow-ups, ensuring that discussions are accurately captured and their context is preserved.

Edge case analysis
For each of the three categories Global Reach, Mass Adoption, and Longevity:

- Identify at least one edge case that represents a challenge or an opportunity for your virtual meeting solution;
- Describe how you could change the design of your software to take it into account.

Case 2: The Ethics Canvas - VR holidays app

Scenario
RealVirtualHolidays is an innovative virtual reality app designed to revolutionize vacation. RealVirtualHolidays 's goal is to provide you with an exceptional vacation experience, minus the drawbacks such as missing flights, unresponsive staff, and unfavorable weather. In a world where carbon footprint matters, RealVirtualHolidays is the eco-friendly travel option.

Users start by selecting one of the vacation packages: domestic, international, or exotic. Upon registration, they'll meet with a confidential consultant. Their role is to assist users in creating the ideal VR vacation, tailored to their desires. Whether you seek great weather, friendly locals, tranquility, or even an exclusive VIP dance party within the Great Pyramid with your favorite celebrity, choose from a variety of destinations.

The Ethics Canvas and group-scale impacts
The goal of this exercise is to evaluate the **impacts this system can have on groups** by focusing on the following blocks in the Ethics Canvas: 2 “groups affected”, 5 “worldview”, and 6 “group conflicts” (right side of the canvas, the blocks from the the left and bottom sides have already been completed).
Follow the steps below and fill the corresponding blocks of the Ethics Canvas.

Step 1: Identify relevant stakeholder - Block 2 “Groups affected”

General question : Which groups might be affected by the technology?
Specific questions :

- Which groups are involved in the design, production, distribution and use of your product or service?
- Which groups might be affected by it? Are these work-related organizations, interest groups, etc.?

Step 2: Identify ethical impacts - Blocks 5 “Worldviews” and 6 “Group conflicts”

General question**:** What are the potential ethical impacts for these groups?
Specific questions:

- Worldviews: How might people’s worldviews be affected by your product or service? Their ideas about consumption, religion, work, etc.?
- Group conflicts: How might group conflict arise or be affected by your product or service? Could it discriminate between people, put them out of work, etc.

Fill out the Ethics Canvas:

Note: the left and bottom sides of the canvas (blocks 1, 3, 4, 7, 8 and 9) have already been completed and are just here for the example, they are not a part of the case study.

<table>
<tr>
<td rowspan="2">1.Individuals affected
- Everyone who wants to go on vacation and who can afford the technology.
- Local population in touristic areas.
- Tourism and transport workers.
- Local business workers.</td>
<td>3.Behaviour
People would reduce their travel.</td>
<td rowspan="2">9.What can we do?
- In order to reduce the negative impacts on the local economy, we could make the virtual shops in the app connected to real local ones.
- Involve locals and in particular cultural minorities in the construction of the virtual travels.
- Communicate on the positive effects of reducing transportation and overtourism on the natural environment and local communities</td>
<td>5.Worldviews</td>
<td rowspan="2">2.Groups affected</td>
</tr>
<tr>
<td>4.Relations
Social interactions between tourists and locals would be reduced.</td>
<td>6.Group Conflicts</td>
</tr>
<tr>
<td colspan="3">7.Product or Service Failure
Potential private information leaks, such as where some people went on vacation.</td>
<td colspan="2">8.Problematic Use of Resources
- Construction of many VR headsets, which is requires lots of material resources and would generate e-waste
- Energy consumption of the usage of the VR technology

- On the other hand, a large reduction in travel (flights in particular) would actually reduce environmental impacts related to transport</td>
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Case 3: Systems thinking - Predictive policing

Context
Predictive policing is an application of algorithmic governance in which police activities, such as intervention and prevention, are supported by algorithms designed to collect and analyze data in order to predict individuals or geospatial areas with an increased probability of criminal activity (Meijer and Wessels, 2019). Based on statistical analysis of past data, an algorithm computes probabilities that crime happens in different areas. The police then use the output of the system to optimize the allocation of police patrols and decide where to send them.

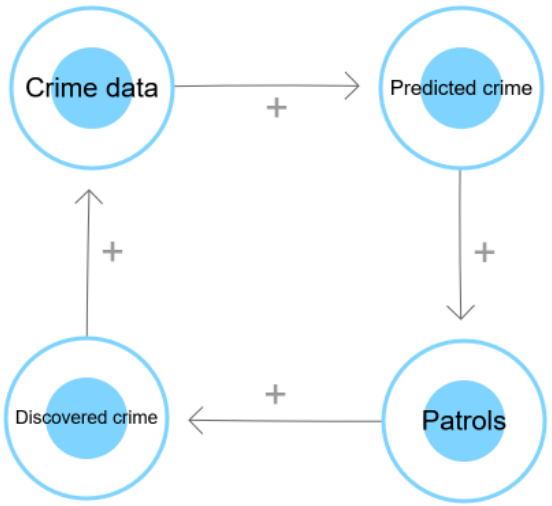
Scenario (fictional and simplified)
A Swiss Canton hears about predictive policing systems and wants to analyze pros and cons of such systems. They hire a team of system thinkers to get a complete in-depth analysis. This team produces a report including causal loop diagrams that you will analyze below.

Part 1: overall operation

The analysis team first provides a diagram presenting in simplified terms how the predictive policing system works overall.

They provide the causal loop diagram below, where the variables are the following:
- Crime data: quantity of data available on crimes in a considered zone
- Predicted crime: quantity of crimes predicted by the system for the considered zone
- Patrols: quantity of police patrols deployed in the considered zone
- Discovered crime: quantity of crimes discovered by police patrols in the considered zone

Question: Describe the diagram by detailing how the variables influence each other. Indicate the nature of the feedback loop (balancing or reinforcing).



Part 2: geographical effects

The analysis team has looked at the geographical effects of deploying a predictive policing system that would optimize the deployment of patrols in two geographical zones A and B.

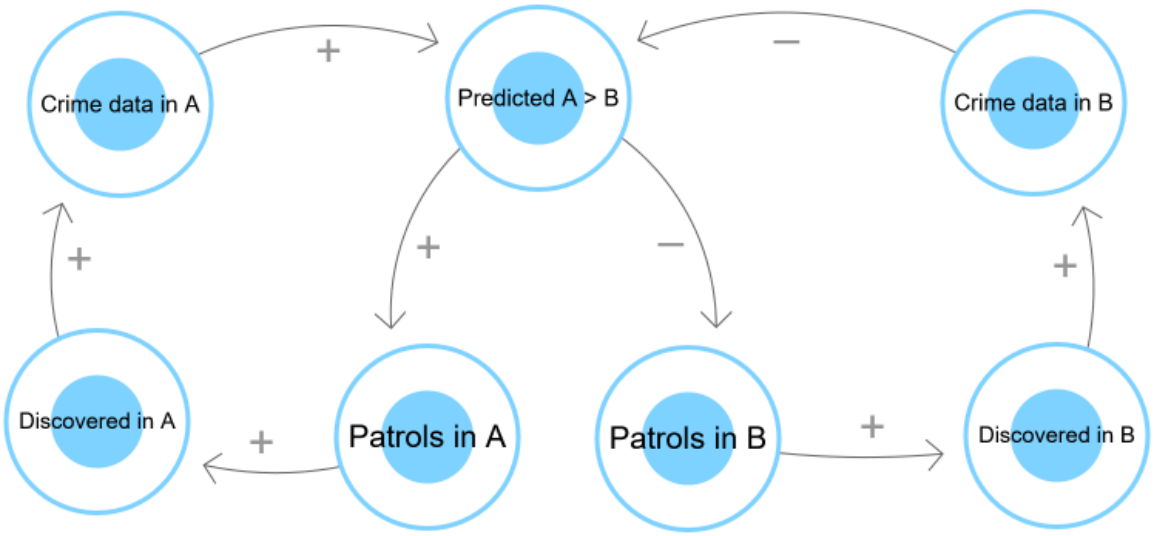
They provide the causal loop diagram below, where the variables are the following:
- Crime data in A/B: quantity of data available on crimes in zone A/B
- Discovered in A/B: quantity of crimes discovered by patrols in zone A/B
- Patrols in A/B: quantity of patrols deployed in zone A/B
- Predicted A > B: quantity of crimes predicted in zone A compared to zone B
    - An increase in Predicted A > B means that the crime rate is predicted to be higher in A than in B

- A decrease in Predicted A > B means that the crime rate is predicted to be lower in A than in B

Questions:

a) Describe the two feedback loops by detailing how the variables influence each other. Indicate the nature of each feedback loop (balancing or reinforcing).

b) While the true crime rates are equal within zones A and B, for historical reasons zone A has been more policed in the past which means that more crime data is available for zone A. What would be the long term effects of deploying the predictive policing system? Use the diagram to identify the consequences. (NB: you can use loopy to make a simulation, https://ncase.me/loopy/v1.1/)



Part 3 [Optional]: community trust and reported crime

The analysis team has looked at the effect of police presence on the confidence that the community has in the police and the quantity of crime that the population reports itself (e.g. theft reported by victims).

They provide the causal loop diagram below, where the variables are the following:

- Patrols: quantity of police patrols deployed
- Discovered crime: quantity of crimes discovered by police patrols
- Community trust: confidence that the population has in the police
- Reported crime: quantity of crimes reported by the population to the police
- Crime data: quantity of data available on crimes
- Predicted crime: quantity of crimes predicted by the predictive policing system

Question: The diagram presents both an inner feedback loop (involving discovered crime) and an outer feedback loop (involving community trust and reported crime). Describe these feedback loops by detailing how the variables influence each other. Indicate the nature of each feedback loop (balancing or reinforcing).

Important note: research on the effects of police presence on community trust indicates a complex relationship with various factors that depend on local contexts, the causal loop diagram in this exercise is an extremely simplified depiction provided for pedagogical purposes only.