

# TechEthos: Eliciting Values, Attitudes and Awareness through a multi staged scenario approach

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# TechEthos

# Challenge



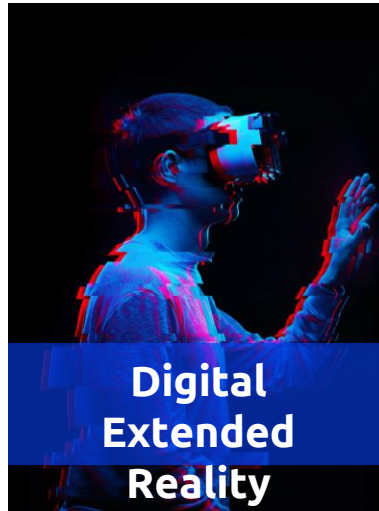
New and emerging technologies are expected to generate new opportunities while also posing a number of potential ethical challenges and societal consequences.

Ethical issues of emerging technologies concern a variety of stakeholders. Projects to identify ethical challenges often focus on limited numbers of experts but do not include citizen's knowledge.

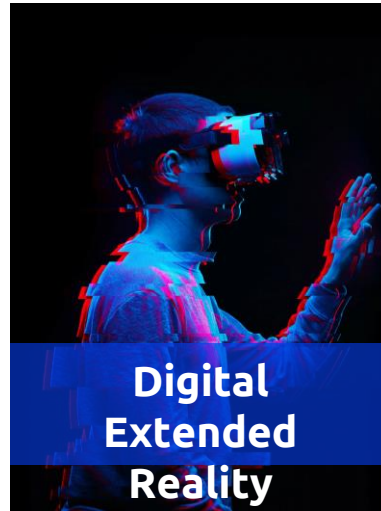
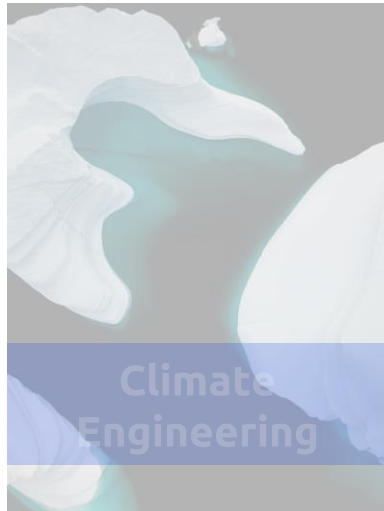
How can we open forward-looking activities, integrate citizens perspectives, and elicit their ethical concerns deliberately?



# TechEthos Technology Portfolio

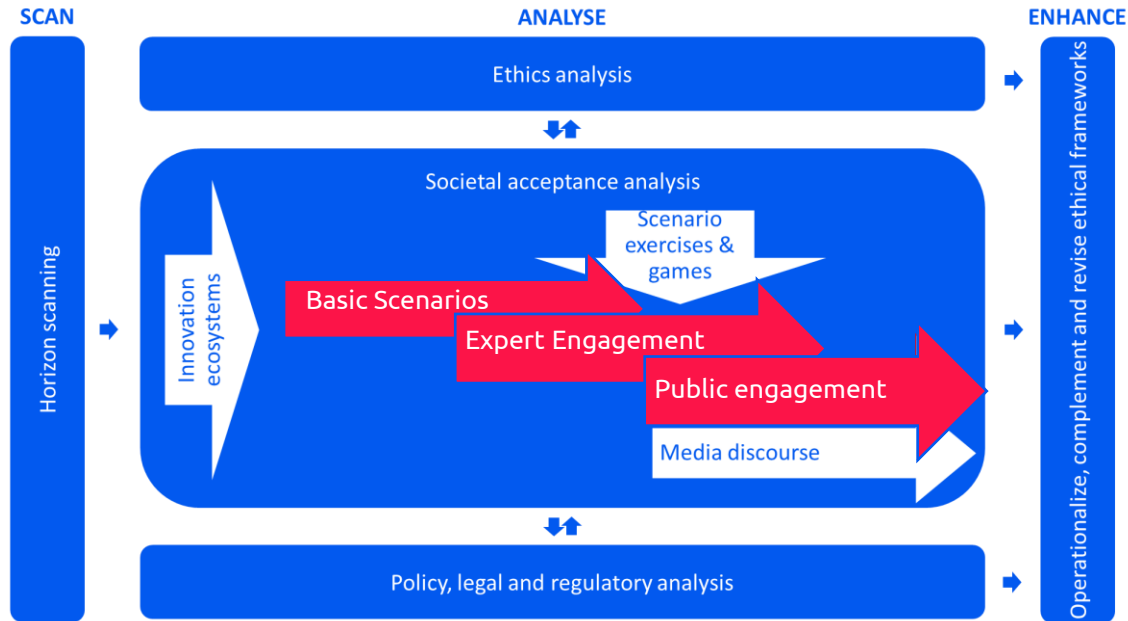


# TechEthos Technology Portfolio



# Multi-Stage & Multi-Stakeholder Approach

# Multi-stage & multi-stakeholder approach



# Multi-stage enrichment

## 1. Basic scenario

- Innovation ecosystem
- STEEPV analysis
- Contextualized issues in a narrative form

## 2. Expert engagement

- Stakeholder workshops
- Hold a broader and systemic perspective,
- Emphasized on looking beyond technology

## 3. Citizen engagement

- Science cafes & game workshop
- Elicited awareness, attitudes, values
- Technology impact on everyday life



# Stage 1

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## Creating Basic Scenarios

# Stage 1 - Basic Scenarios

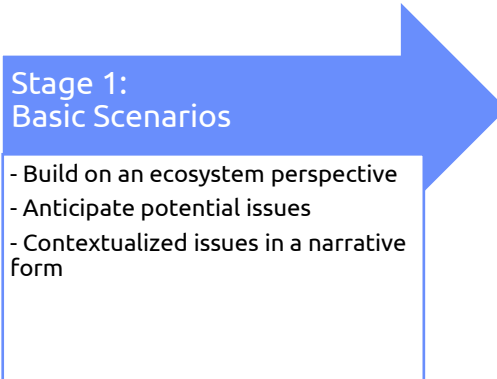
## Three narrative scenarios per technology

- Contextualizing the technology in a specific domain (e.g., work, education, health, etc.)
- Highlighting potential ethical issues within this domain
- Serve as conversation starters to explore further ethical challenges



# Evolution of advanced TechEthos scenarios

**Objective:** Explore the awareness, attitudes and values of various stakeholders to enrich the ethical challenges defined in the basic scenarios.



# Stage 2

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# Expert engagement

# Stage 2 - Expert engagement

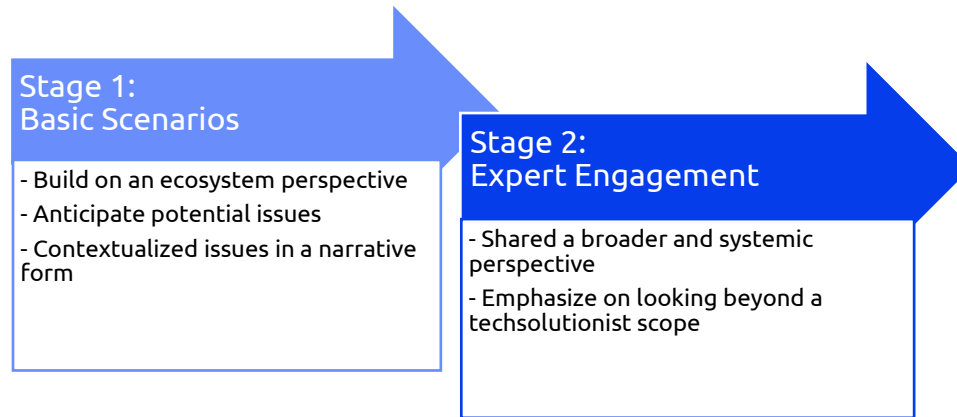
## Three workshops to enrich scenarios

- 8 participants + TE members (authors & facilitators)
- Reflection on identified ethical challenges
- Development of potential solutions
- Enrichment through different perspective and further concerns



# Evolution of advanced TechEthos scenarios

**Objective:** Explore the awareness, attitudes and values of various stakeholders to enrich the ethical challenges defined in the basic scenarios.



# Stage 3

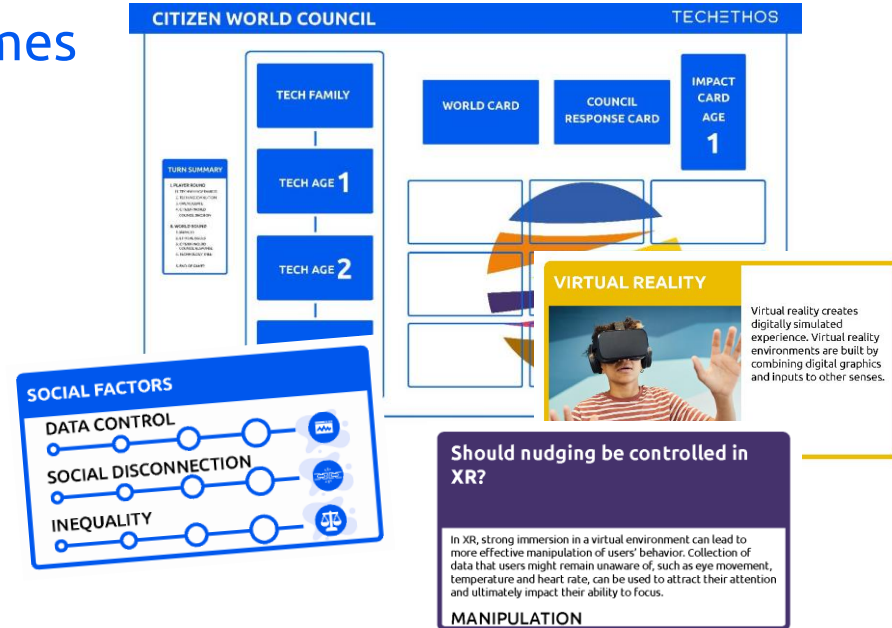
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# Citizen engagement

# Stage 3 – Citizen engagement

## Develop scenario exercises and games

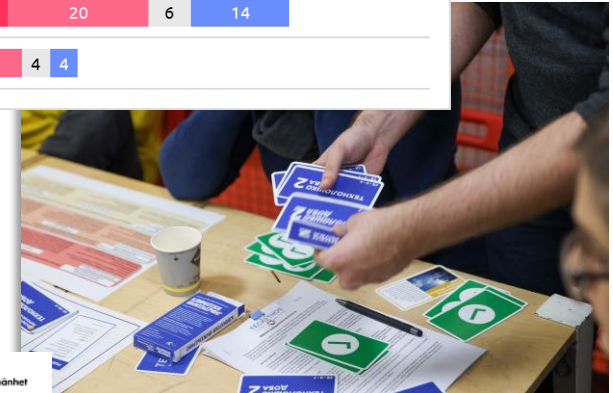
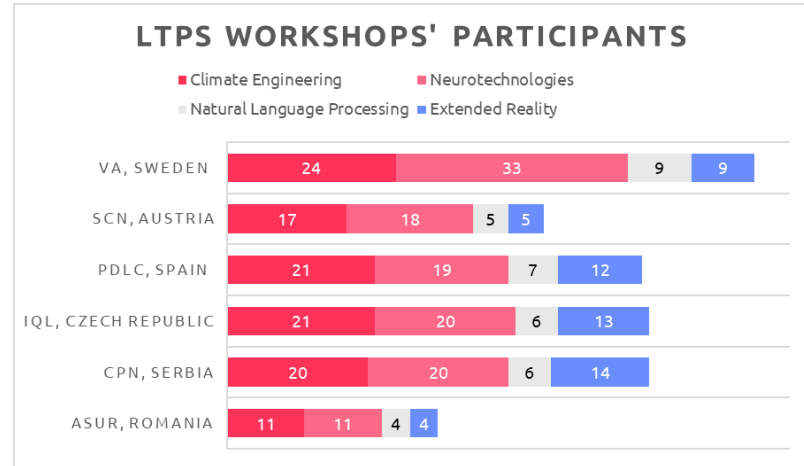
- Developed by TU Delft & Ecsite
  - Supported by AIT
- Role Play: Citizen World Council
  - Which technology you would support / ban?
  - Game to stimulate discussion
- Creation of the TechEthos game
  - Two decks (One for NLP; one for XR)
  - Core of the public engagement process





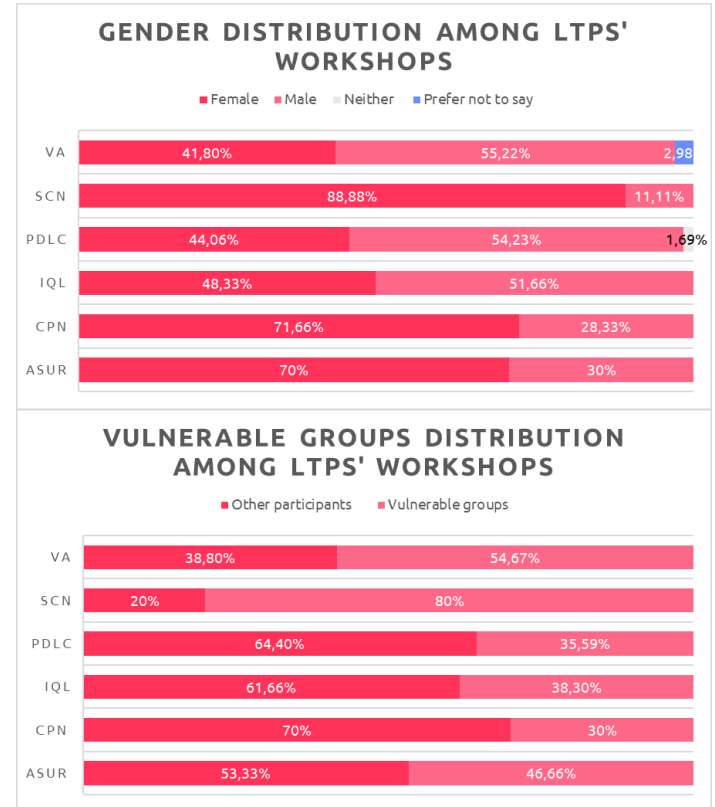
# General overview

- 20 workshops
- Dec 2022 – March 2023
- 6 countries  
(Austria, Czech Republic, Romania, Serbia, Spain, Sweden)
- 331 participants  
(XR: 57, NLP: 37, Other tech: 237)



# Participants overview

- 58.25% female 40.80% male / 0.93% do not identify with any gender or prefer not to share
- >30% of participants belonged to vulnerable groups
  - socio-economic disadvantage, 18%
  - social and physical isolation, 10%
  - gender and LGBTQ+, 13%
  - minority status, 40%
  - learning difficulties, 4%
  - physical difficulties and disabilities, 10%
  - mental and physical health, 5%



# Game workshops

- **Objective:**
  - Generate information about public and civil society perceptions
- **Part of a workshop:**
  - Introductory activities
  - Game sessions
  - Debrief session for reflection and discussions
- **Documentation and Data collection:**
  - Pre- and post-event survey data collection sheet
  - Transcripts in form data reporting templates
  - Qualitative and quantitative data on **awareness**, **attitudes** and **values**



Stage 3  
-  
Awareness,  
Attitudes & Acceptance,  
and Values

# Concept definition

## Awareness

- Whether individuals have heard of the technology family or technologies featured in the TechEthos project. “very aware,” “somewhat aware,” and “not really aware.”

## Attitudes & Acceptance

- “When you think about these technologies, do you feel excited, do you feel concerned?” “Very excited/concerned”, “excited/concerned”, “little excited/concerned”, “not excited/concerned”, and “not sure”.

## Values

- What an individual or group, “**considers very important**, because they refer to legitimate interests, mutual obligations and/or views of the good life” (Boenink et al 2010).

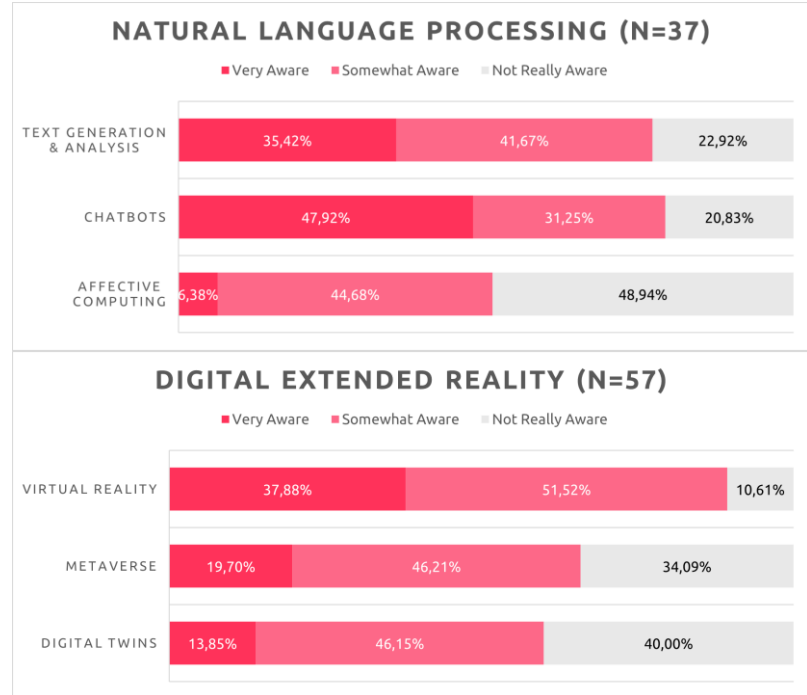
# Citizens' Awareness

## Media, popular culture & Sci-Fi

- Most popular technologies
  - Chatbots: 48% very aware
  - Virtual Reality: 38% very aware

*"A kind of artificial intelligence similar to ChatGPT."*  
(Comment 298, NLP)

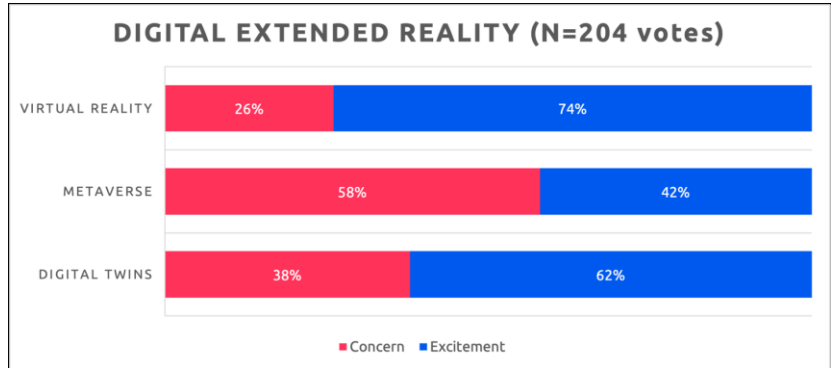
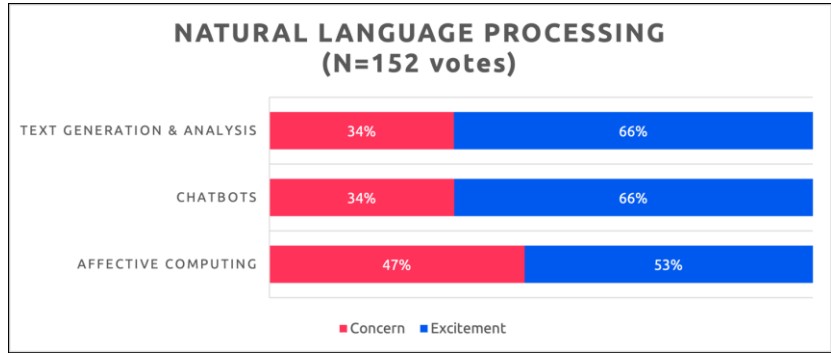
*"It's like the matrix. We're already in the matrix. Every science fiction will become reality one day."*  
(Comment 332, XR)



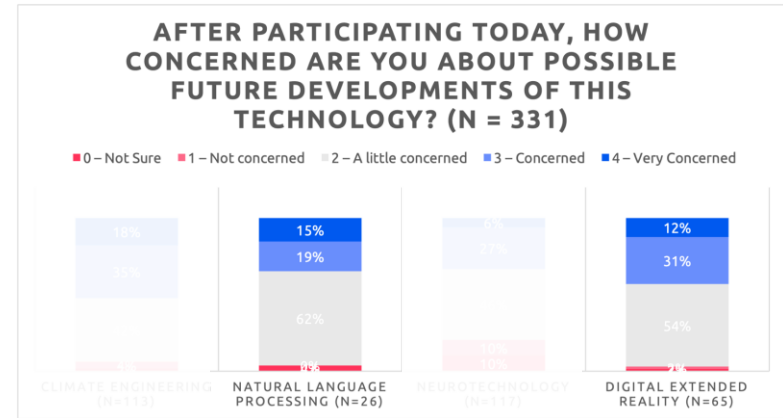
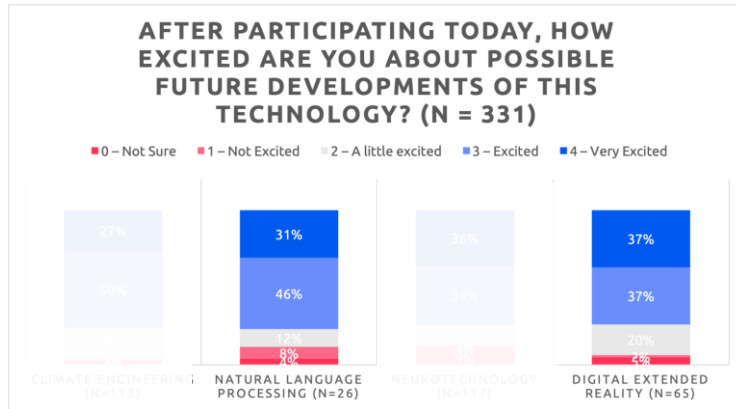
# Citizens' Attitudes

## Excitement & Concerns

- NLP
  - Excited: **chatbots & text generation and analysis**, as both will simplify work and make job's easier.
  - Concerned: **affective computing** due to possible misuse and data protection issues
  
- XR:
  - Excited: **virtual reality** (close to digital twins). As they can experience far off places or historical places.
  - Concerned: **Metaverse**, as it may cause the loss of natural human connection and holds the possibility of data privacy issues.



# Conflicting Attitudes



*"People will lose their jobs and certain positions will be in trouble. What will happen to the jobs of content writers, translators and journalists?" (Comment 103, NLP)*

*"... relieving people of mundane repetitive jobs." (Comment 422, NLP)*



# Citizens' Acceptance

Citizens are both: Concerned and excited at the same time

- ... but for different reasons.

**“Participants accept the technology if [X] is assured and if [Y] can be prevented.”**

- ... [x] and [y] are what participants value (and want to see protected).

## Stage 3

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How to elicit & analyze values?

# How to elicit values?

- 773 comments
- Coded for expressed values

*“Companies can have essential data on individuals that serve to give them more control over them while individuals lose control over their personal data.” (Comment 8, XR)*

- Data safety
- Autonomy
- Privacy

country tech family technology comment codes

Balance Certain	Table	Technology Family	Technology	Excitement / Concern	Tech Age Level	Initial Impressions & Discussion	Values	Category	Value
ASUR, Romania	Plenum	CE	Unspecific	Excitement	Before the game	Excitement about learning more about the technologies and their implications for this generation and the next ones	Intergenerational Justice	Justice	
ASUR, Romania	Plenum	CE	Unspecific	Concern	Before the game	Concern about too little time to "fix the world" and mistakes that we could make in the process	Dangerous Side-effects	Safety and reliability	Reliability
ASUR, Romania	Group 1	CE	Unspecific	Excitement	Unveiling the technology family	All participants are parents. They are excited about Climate Engineering and curious about the technologies that could improve the lives on Earth for the next generations, including for their children and grandchildren.	Intergenerational Justice	Justice	
ASUR, Romania	Group 1	CE	SRM / CCL-1	Concern	Tech Age 1	Somewhat concerning, because they do not totally trust that the chemical reactions that can pollute the air in the case of this technology. P1 expresses concern for SRM (she believed that it could cool down the Earth to the extremes). P2 thinks SRM makes cheap and safe. P2 does not think P1 would vote for this because she is curious where it will lead. P3 is excited for its uses.	Dangerous Side-effects	Safety and reliability	Reliability
ASUR, Romania	Group 1	CE	Engineered CO2	Excitement	Tech Age 1	Interesting, has potential. P2 says it has the best risks. P3 thinks it will be the easiest to deploy. P2 thinks this and the other CO2s are the most likely to help more people	global climate responsibility	Justice	global effectiveness
ASUR, Romania	Group 1	CE	Nature-Based C	Excitement	Tech Age 1	Favourite of most, talks about "nature healing best". P1 thinks that nature-based CO2 is the safest. P4 sees it as the most cost-effective	Healthy Environment	Ecosystem health	Safety
ASUR, Romania	Group 1	CE	Bioenergy with	Concern	Tech Age 2	Liked by a few, the other are essential. P4 this is balanced, will grow and fast. P7 and could be done faster than others, because time is an issue when it comes to climate	Efficiency	Effectiveness and efficiency	Effective
ASUR, Romania	Group 1	CE	Forestry and lar	Excitement	Tech Age 2	Mostly liked. P1: This is the safest and most "clean". P7: but the land is limited, and it will run into biodiversity. P8: it has the best offset problems and probably the most benefits	Biodiversity	Ecosystem Health	Safety
ASUR, Romania	Group 1	CE	Ocean fertilisa	Balanced	Tech Age 2	Liked by a few, the other are skeptical. P6: I am most concerned about what we put in the water. P7: not about the CO2, because it is already there, but one accident could lead to huge ocean contamination. P9.	Environmental Quality	Ecosystem health	Safety
ASUR, Romania	Group 1	CE	Enhanced weed	Concern	Tech Age 2	Disliked by most. P10 & P11: mixing is dangerous, this should not go forward. P2: look less interesting than other	Safety	Safety and reliability	
ASUR, Romania	Group 1	CE	Direct Air Carb	Unvalued	Tech Age 2	Interesting, attracted the most opinions. P6 & P10: this one has the least benefits. P2: it will be more and more accessible once renewable energy will become cheaper. P8: it will cause a lot of offset between power and carbon reform. P9: sounds simple, but costly, not sure about who will use it, who will control it and how it will benefit the large communities	Climate Justice	Justice	Accessibility
ASUR, Romania	Group 1	CE	Soil Carbon Sec	Excitement	Tech Age 2	Liked by most. P1: This is nice, but will require education and generational thinking. P5: from the ethics standpoint, it's interesting.	Intergenerational Justice	Justice	Non-technological solution

# Citizens' values

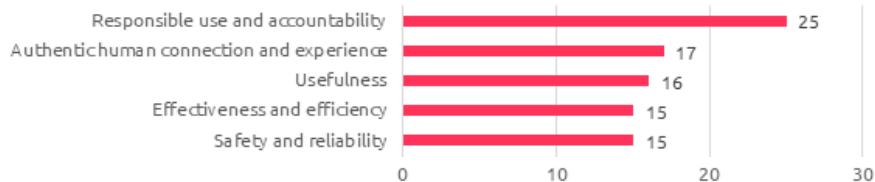
## Clustering the codes

- 450+ codes
- Group of 25 categories

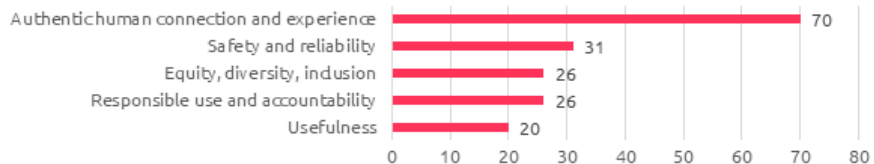


# Citizens' values on XR

## Natural Language Processing (N=212 counts)



## Digital Extended Reality (N=359 counts)



## Responsible use and accountability

*"Who is responsible? - The first dilemma is whether the chatbot manufacturer or the user is responsible, and I have a whole chain of command actors between them."* (Comment 137, NLP)

## Authentic human connection and experience

*"The chatbot will change our personality through interaction, we will start to behave differently, and it is very possible that it will dehumanize us."* (Comment 131, NLP)

## Safety and reliability

*"It allows for risk-free practice in professions such as medicine, security and even everyday tasks such as driving. - They claimed that this is the best advantage of having a digital twins because it would avoid many risks in different areas."* (Comment 635, XR)

## Equity, diversity and inclusion

*"The centre of discussion was the lack of access because the high cost of this technology. The main concern was inequity by money."* (Comment 652, XR)

## Effectiveness and efficiency

*"It's possible you'll get yourself imitated and you won't have to write any more emails. So the AI will have us all loaded."* (Comment 299, NLP)

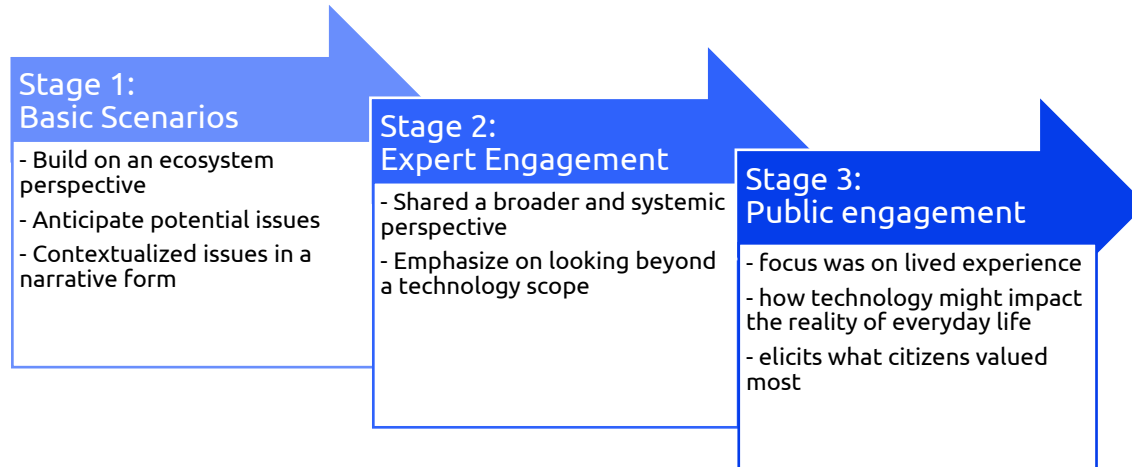
# Wrap Up

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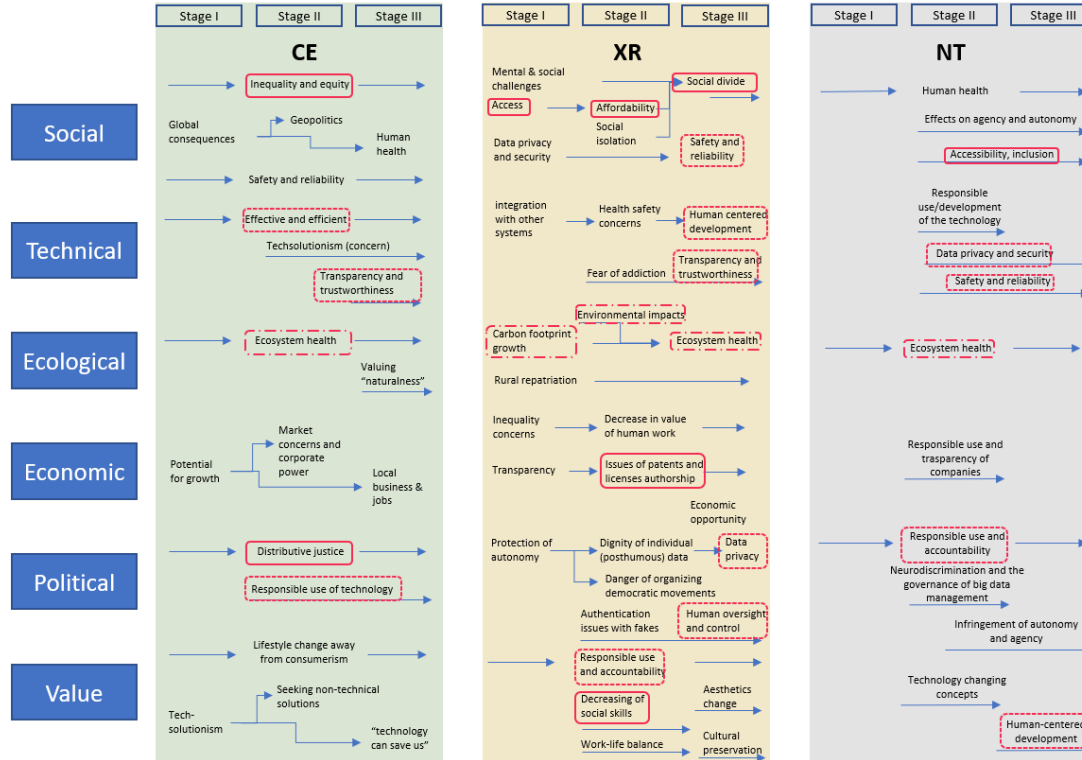
## Results, Highlights & Discussion

# Evolution of advanced TechEthos scenarios

**Objective:** Explore the awareness, attitudes and values of various stakeholders to enrich the ethical challenges defined in the basic scenarios.



# Results





# Highlighting ethical issues

## Three overarching themes in the context of XR

- **Equity**
  - **Affordability** of the technology as well as the fair distribution of benefits.
  - **Disruption of markets** might shift power dynamics in favour of AI developing companies.
  - Acknowledgment of licenses and **authorship**, as well as a fair distribution of benefits among society
- **(Re)liability**
  - **Data rights** and the responsible use of the collected data becomes important.
  - **Trusting visions** and holding companies accountable for promises (e.g. techsolution for social problem)
  - **Human centred development** over company revenues generated from the technology.
- **Environmental sustainability**
  - Rise of **CO2 emissions** providing a globally accessible infrastructure for training LLMs and storing data.
  - **Resource** & disposal problem (i.e., increasing rare earth mining or toxic waste)

# Learnings & Take-aways

## ...from the multi-stage & multi-stakeholder approach

- Each stage enriched the set of results by offering new perspectives on the social-ethical dimensions of the technology families:
  - Potential issues that were on the fringes of the current discourse (which are covered through the citizen engagement)
  - Opening up perspectives beyond the scope of the researchers
  - Ranking of concerns through analysis of the citizen engagement results

# TECHETHOS

FUTURE ○ TECHNOLOGY ○ ETHICS

Thank you!

Looking forward to the discussion

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