



Phygital solutions for the cultural and creative industries

Towards Ethical, Human-Centered XR Experiences

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Spring school on Social XR - 23rd of April 2026



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**Thanks to the
organizers**



Briefly about me



- Associate professor at NTNU (Trondheim)
- PhD from Ghent University, Belgium
- Current projects: SFI [NORCICS](#) (RCN), [AMPLIFY](#) (EU), [Cryptology and social life](#) (NTNU), [SODI](#) (RCN)
- EiC [Quality and User Experience](#) (Springer)
- **Keywords:** human-technology experiences, human-centered design and evaluation, methodological and ethical implications, usable privacy and security



NORCICS

SFI Norwegian Centre for
Cybersecurity in Critical
Sectors



3

 **NTNU**



Norwegian Centre
for Research-based
Innovation



Goals of this workshop + disclaimer

AGENDA

- Check-in
- Setting the stage part 1: experiences from the AMPLIFY project
- Group discussion #1
- Short break
- Setting the stage part 2: XR4Human Code
- Group discussion #2: World café
- Final reflections
- Check-out



0. Check-in

Check-in

Take a moment to “land”. Give everyone in the group the chance to share (2 minutes per person). Briefly (re-)introduce yourself if needed.

- How are you “arriving” in this workshop? (feeling overwhelmed, inspired, tired, No filter)
- Which topic(s) really triggered your interest this week, and why?



 MPLIFY



1.



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About AMPLIFY



AMPLIFY is a consortium of artists, technologists and researchers from 8 European countries dedicated to facilitating the digital transition in the Cultural and Creative Industries.



01

Creating **novel human-centred artistic experiences** that **connect people in *phygital* relationships** among and between artists and audiences

02

Developing an **AI-driven audiovisual production tool in a portable box** that will **enhance the experience of performing and consuming *phygital* live music**

03

Developing **technological XR enablers to create immersive stages** for ***phygital* engagement and interaction**

04

Promoting **music as a unique, creative, cohesive and inclusive language for society** by testing the digital tools in human-centred real-world small-scale pilots

05

Strengthening the **sustainability and market position of European CCIs** by **building their capabilities** and use of AMPLIFY's novel technology and formats



AMPLIFY CREATIVE

Play, learn, and perform music together, from anywhere, enhanced by AI-driven automatic audiovisual production mechanisms.



AMPLIFY IMMERSIVE

Create and share live immersive experiences with hybrid physical-remote interactions between and among artists and audiences.

2.

**Ethical and human-centred:
why and key principles?**

Why?

“...any effort aiming to genuinely contribute to a human-centred, sustainable digital transition in the CCIs needs to put **humans at the heart** of the technology design process at every stage.”

→ Technology is a means, not the goal in itself

Key principles

- Participatory
- Inclusive and value-driven
- We combine methods in a way that helps us further
- Ethical in and through design
- We focus on the whole experience
- We go and learn step by step

3.

How?

Ethical and human-centric methodology

3 phases, 2 iterations



1. Understanding requirements, designing together

→ **Goal:** Trying to understand what different stakeholders need, fear, envision, which ideas they have.

2. Small-scale testing (e.g., in a lab)

→ **Goal:** Gathering meaningful feedback, learn and improve. What works? What doesn't?

3. Testing the technology in the real world

→ **Goal:** Evaluating the “amplified” experiences in a natural setting (e.g., real concert, class, ...)

Ethical and human-centric methodology

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(De)socialisation

Authorship

Inclusion and inclusive participation

Diversity

Privacy

Potential for misuse

Consent

Existing inequality

(Un)equal access

Range of social and ethical issues that digitalization may raise / exacerbate / address

(Loss of) Agency

Trust

(Dis)empowerment

Human dignity

Social disparities

Autonomy

Power imbalance

Deskilling

Ethical management of digital identities

Artistic integrity

Two (intertwined) perspectives



Ethics and privacy in **how** we conduct our research (e.g., user testing, data gathering)



Ethical considerations **in** our research and **throughout** the design process

Ethical considerations in our research and throughout the **AMPLIFY** design process



- Who makes design decisions and what are they based on?
- What are potential short- and long-term consequences and implications?
- Who do we (not) include? Who is (not) represented?
- What might be ethical bottlenecks?
- Who do we want to empower?
- What can we learn from existing literature?
-
- **Ethics by design** approach – **in practice!**

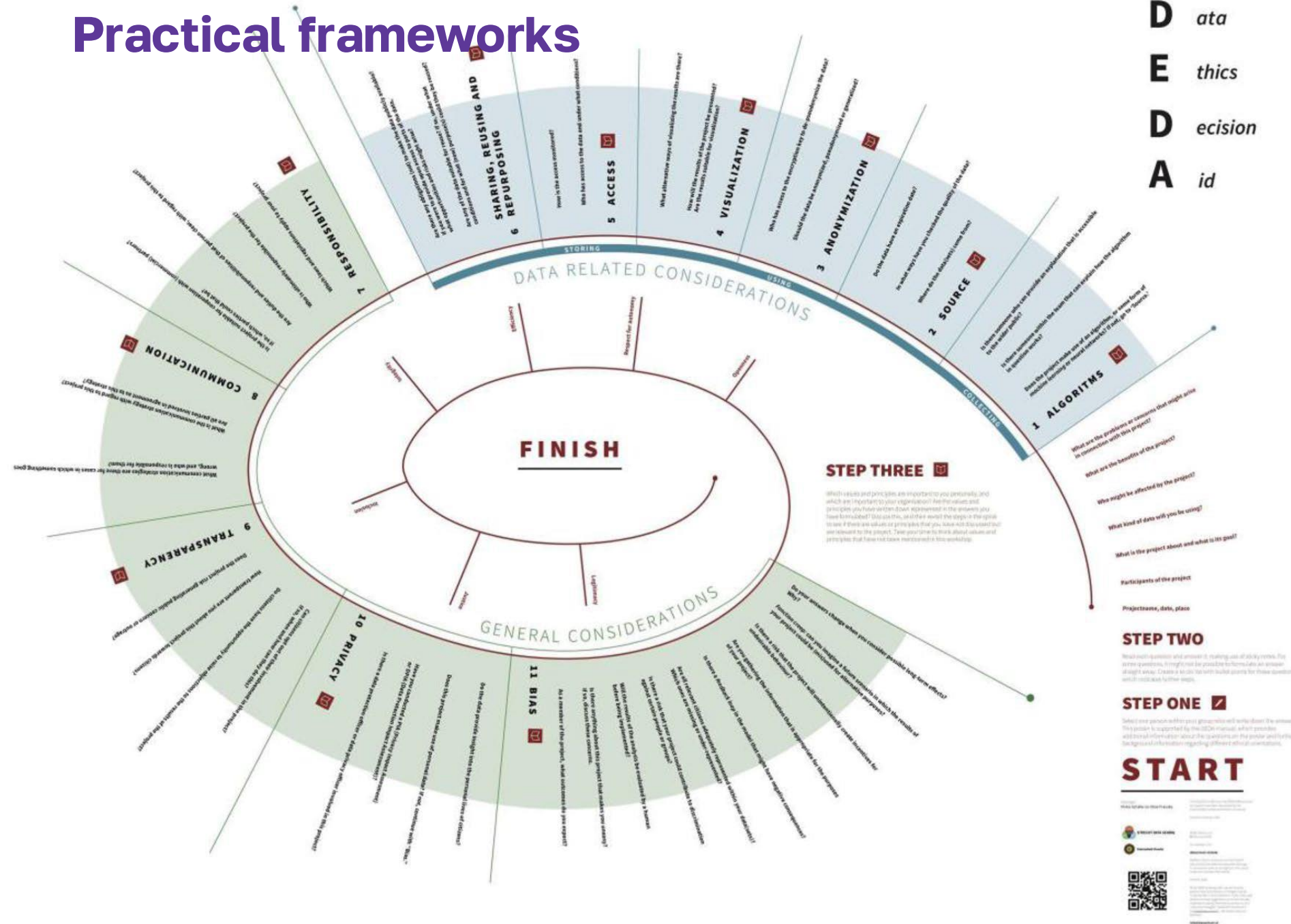
Practical frameworks

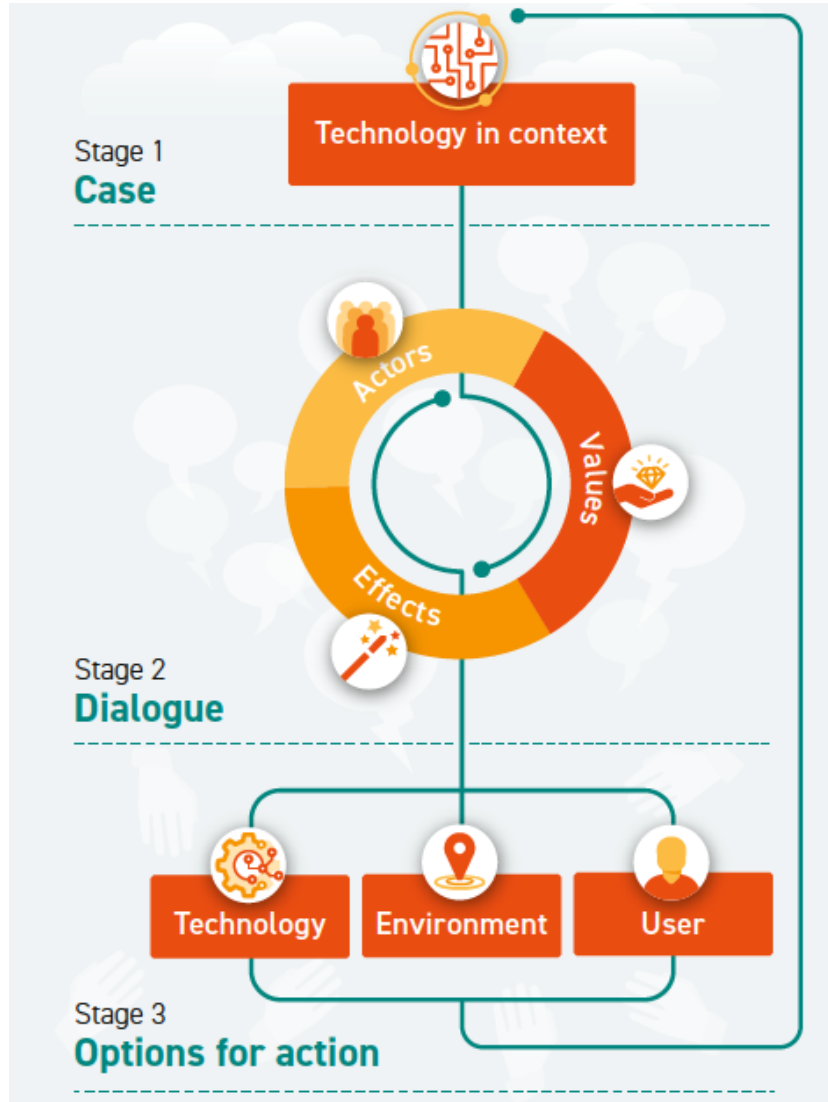


D ata
E thics
D ecision
A id

DEDA is a **tool-kit facilitating initial brainstorming sessions to map ethical issues** in data projects, documenting the deliberation process and furthering accountability towards the various stakeholders and the public.

<https://deda.dataschool.nl/en/>





Interweaving of ethical considerations – Guidance ethics approach (Verbeek and Tijink, 2020)

- A tool for “*Constructively thinking about ethical questions and concerns to give technological developments a desirable direction*”
- Not black and white – focus on how to design technology in a responsible manner, ethical under which conditions?
- Social implications, central values at stake?
- Negative AND positive consequences
- Concrete technologies and their specific effects and consequences, no generic analyses

Key characteristics of “Guidance Ethics”



“Ethics from within”:

Embedding ethical thinking directly into the design, implementation, and use of technology, rather than evaluating it only after the fact.



“Bottom-up ethics”:

Instead of imposing predefined rules from the top down, it builds ethical understanding from real experiences, practices, and societal perspectives.



“Positive ethics”:

Emphasizes guiding technology development toward shared goals and values—what we want to achieve—rather than only outlining what should be avoided.

4.

**How? Some illustrations from
the different pilots**

Renewing tradition

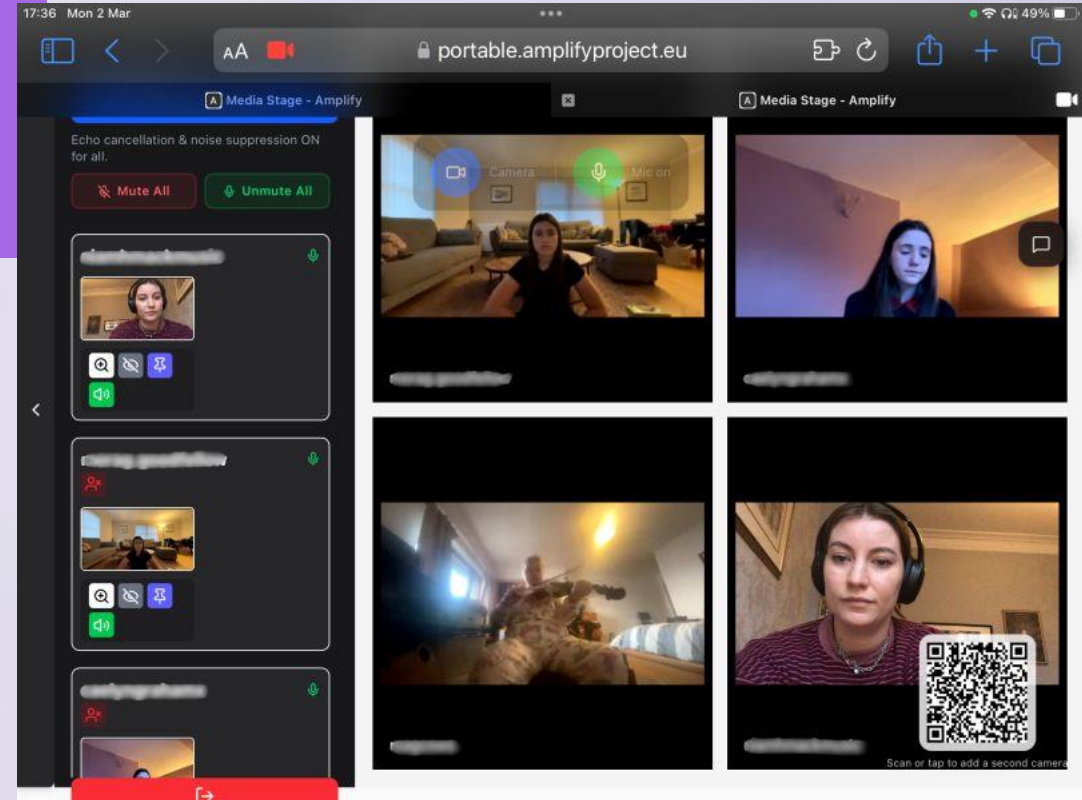
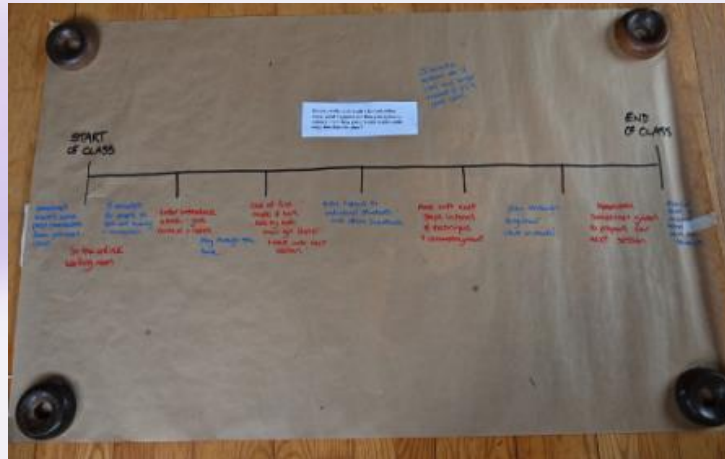
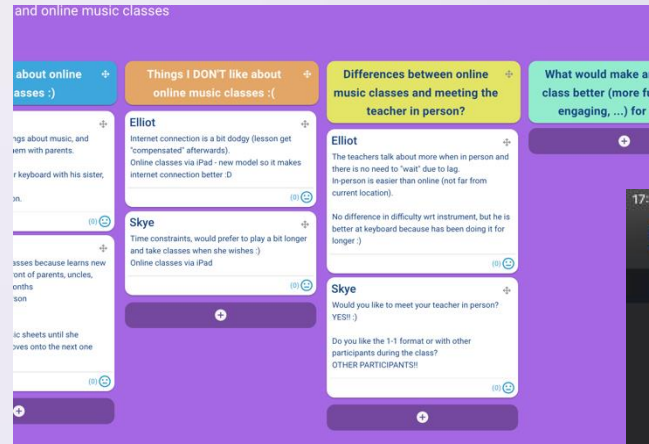
AMPLIFY CREATIVE provides an easy-to-use, low-cost digital tool to enable professional and nonprofessional musicians (especially young people), to learn, rehearse and perform together from different locations.

Pilot leader: Fèisean nan Gàidheal

Location: Scotland

Technology tested: AMPLIFY CREATIVE STUDIO





Music with babies

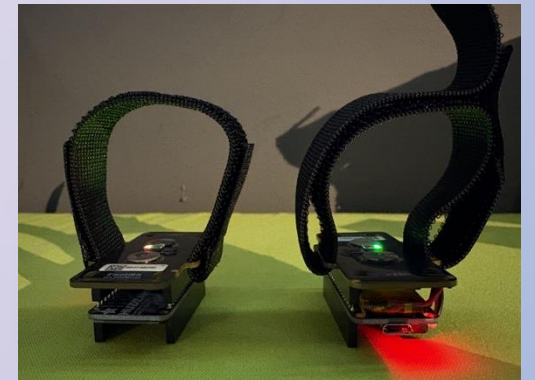
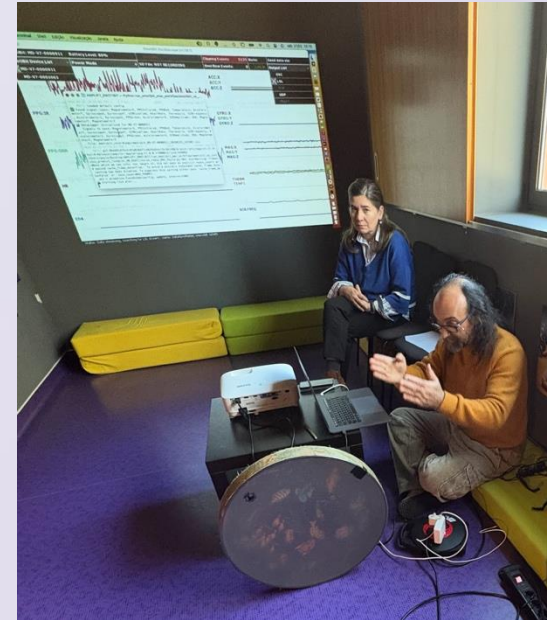
Sensors that capture a human being's emotional reactions when listening to music, and tools that translate those same reactions into a graphic score.

Pilot leader: Cooperativa Paulo Lameiro CRL and MUSICALMENTE

Location: Portugal

Technology tested: AMPLIFY CREATIVE PLAYGROUND





Next stage

This pilot transforms traditional concert experiences by allowing audiences to enjoy live performances through augmented reality. The pilot will test an “immersive stage”, created with AMPLIFY IMMERSIVE, which the festival audience can approach with XR headsets.

Pilot leader: Toscana Produzione Musica

Location: Italy

Technology tested: AMPLIFY IMMERSIVE STAGE





Revealing opera

Pilot 4 uses AMPLIFY IMMERSIVE to create a parallel experience with a symbiotic relationship to the opera itself. It draws on the memories of former political prisoners to bring to life a co-created, digital reconstruction of the Trinitat Vella prison, currently slated for demolition.

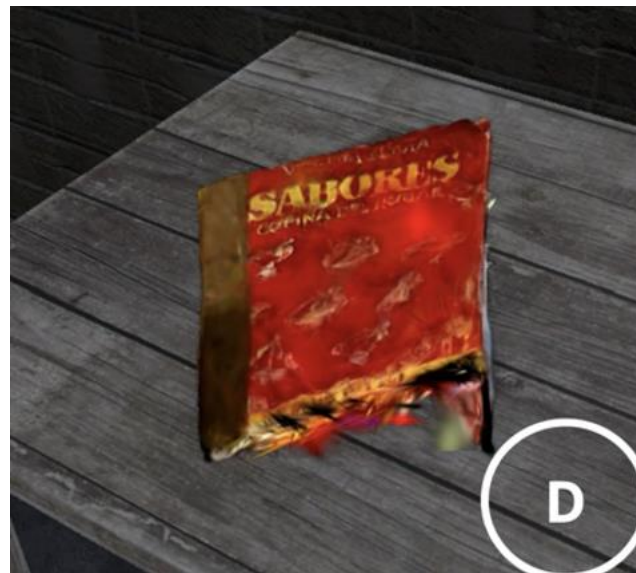
Pilot leader: Gran Teatre del Liceu

Location: Barcelona

Technology tested: AMPLIFY IMMERSIVE SPACE



About AMPLIFY





Initial reflections

- Tensions
- Genuine participation
- Methodological flexibility
- Ethics as continuous care
- Impact on the artistic experience
- Artists' presence and well-being

Group discussion #1 (20 minutes)

Think of **your own PhD project** (concrete “**case**” you are working on) or how it may fit into a bigger picture

1. 1 min. individual reflection about the questions (write key points on post-its)
2. Briefly describe your “case” and share in your group (others can help by asking questions)
3. Try to cluster along the way



Group discussion #1

- **Who are the relevant ACTORS/STAKEHOLDERS?**
 - Who needs to be actively involved?
 - Who needs to be aware or may be affected but is not a direct actor/stakeholder?
- **What might be the EFFECTS of the XR solution/use case/technology you are working on for different stakeholders?**
 - E.g., Positive vs. negative; Expected vs. unexpected; Desired vs. undesired
- **Which VALUES play a role**
 - Which values are considered most important?
 - Which values might be at stake if you don't get this right?



Top-down approach – Ethics in XR



- **What makes (Social) XR ethically distinct?**

- Co-presence, embodiment, identity representation, ...
- Amount of data collected by XR devices
- Emotional intensity, psychological aspects, ...
- ...

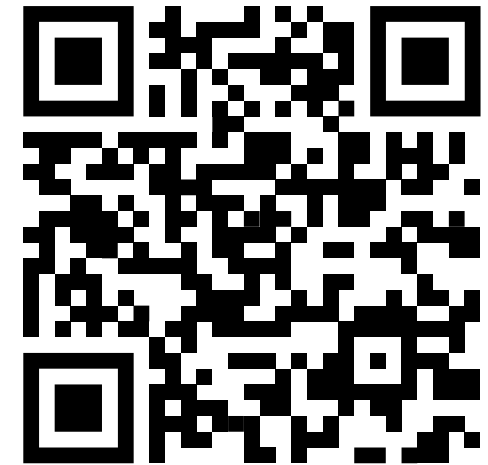
- **Different levels**

- **Individual** (e.g., well-being, identity, ...)
- **Relational** (e.g., norms, harassment, ...)
- **Systematic** (e.g., platform governance, data extraction, inequality, ...)





Code of Conduct for the Human-Centered and Ethical Development of Immersive Technologies



<https://xr4human.eu/xr4human-code-of-conduct/>

XR4Human Code of Conduct Principles



XR4Human Code of Conduct



1. User Transparency by Design
2. Data Protection and Privacy by Design
3. Risk Management by Design
4. Well-being By Design
5. Identity, personas and avatars
6. Shared Spaces
7. Engagement with Non-Human Resources

Group discussion #2: World café

Write key points on post-its, at the end of each discussion, each group selects 3 post-its

Switch table after each round

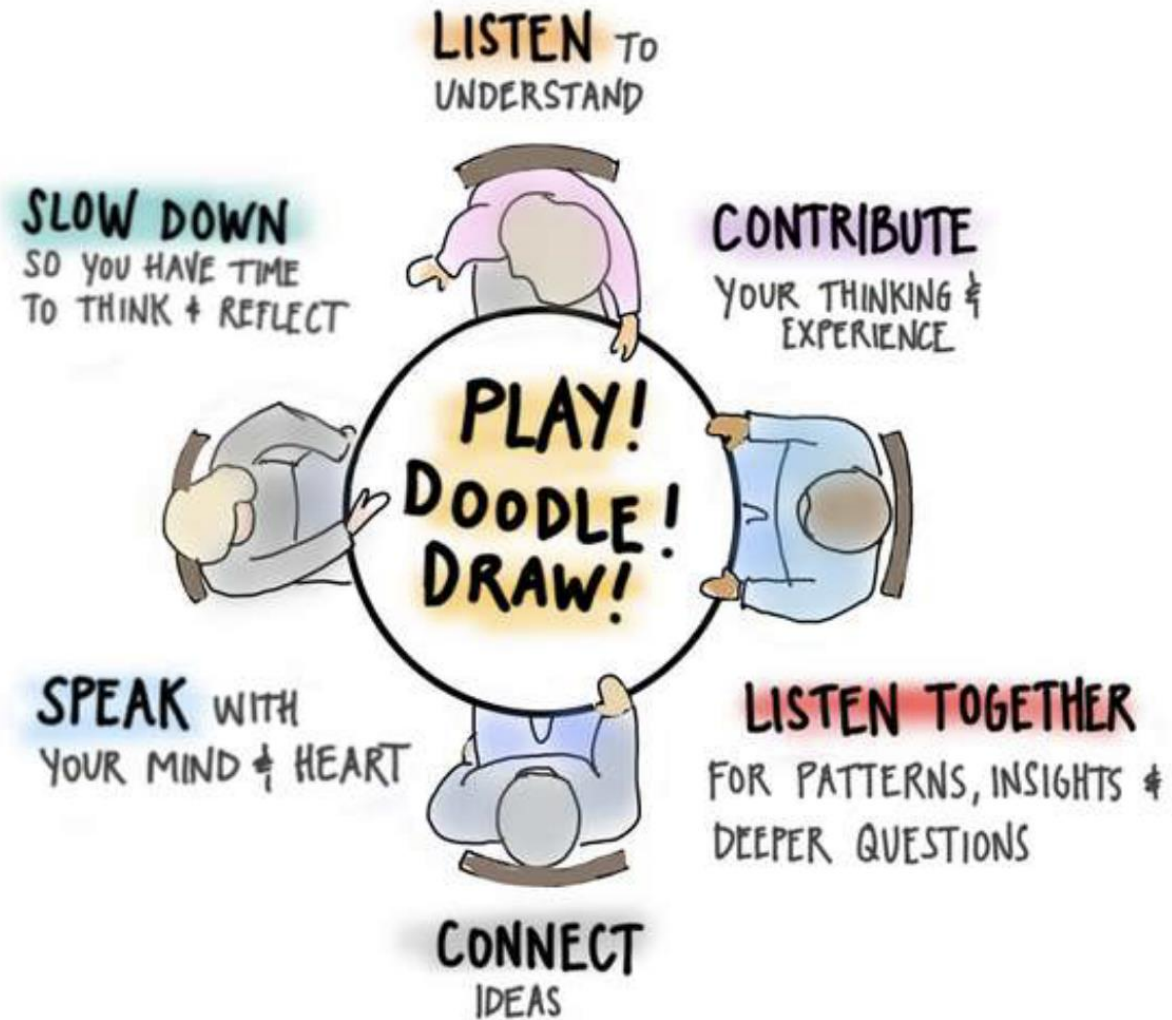


Image: Art of Hosting Practice Guide 2025, Karlskrona

Round #1 Recognizing ethical considerations in your project (15 minutes)



Conversation starters (choose 1–2):

- When you think about your PhD project, which ideas from the guiding principles / articles in the XR4Human Code of Conduct resonate most strongly with what you are already doing?
- Which ethical tension(s) have you already encountered or do you anticipate to encounter?
- Which ethical or human-centered aspects of your project feel implicit rather than explicit?
- Who is your project currently centred on—and who might be affected more indirectly?

Round #2 Tensions, trade-offs and constraints (15 minutes)



Conversation starters (choose 1-2):

- Where does applying the XR4Human Code of Conduct feel difficult, unrealistic, or in tension with how your PhD project is currently set up? Why?
- Are there ethical compromises you have already made because of time, scope, methods, or expectations?
- How do disciplinary norms or evaluation criteria shape what ethical questions you feel able to raise?

Round #3 From principles to practice (15 minutes)



Conversation starters (choose 1–2):

- Looking at your own project right now, what is one small but meaningful way you could make an ethical or human-centered principle more explicit?
- Where in your research process (design, data, participants, documentation, ...) could ethical considerations become more visible?
- What ideas or practices from others at your table feel transferable to your own work?
- What support, structure, or conversation would help you further?

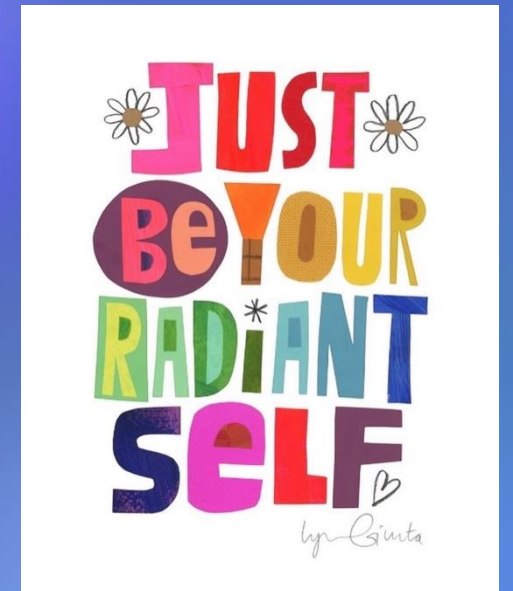
5.

Wrap-up

Check-out

Everyone in the group should get the chance to share.

- What question about ethics in XR now feels more urgent for you than when you arrived?
- What are you looking forward to after the Spring School is finished?





Phygital solutions for the cultural and creative industries

www.amplifyproject.eu

Thank you!

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