



Game Rulebook



30-45 minutes



3 to 7 players

Getting started

You have been chosen, from a wide array of applicants, to sit on your regional delegation to the Citizen World Council (CWC) and decide in good conscience what may be best for future generations of people and the Planet.

The CWC has to forge the future starting with a specific set of technologies that we see emerging and whose potential is not yet realised. It will be your duty to decide which technological developments you personally value the most for a better future.

Be careful: each of your decisions will have unforeseeable consequences on three aspects of society. At each step in the game, you will learn the impact of your choices. Your mission is to avoid that any of the three social factors reach their limit. Because if the impacts are too significant, the world as we know it will change beyond our recognition.

But do not despair! There is hope: if at some point the impact on a social factor during the game reaches its limits, the Citizen World Council has the power to respond with global actions that set ethical boundaries to technological developments. This will help cancel a card's impact on social factors and make the world safe – at least for another round.

Let's play!

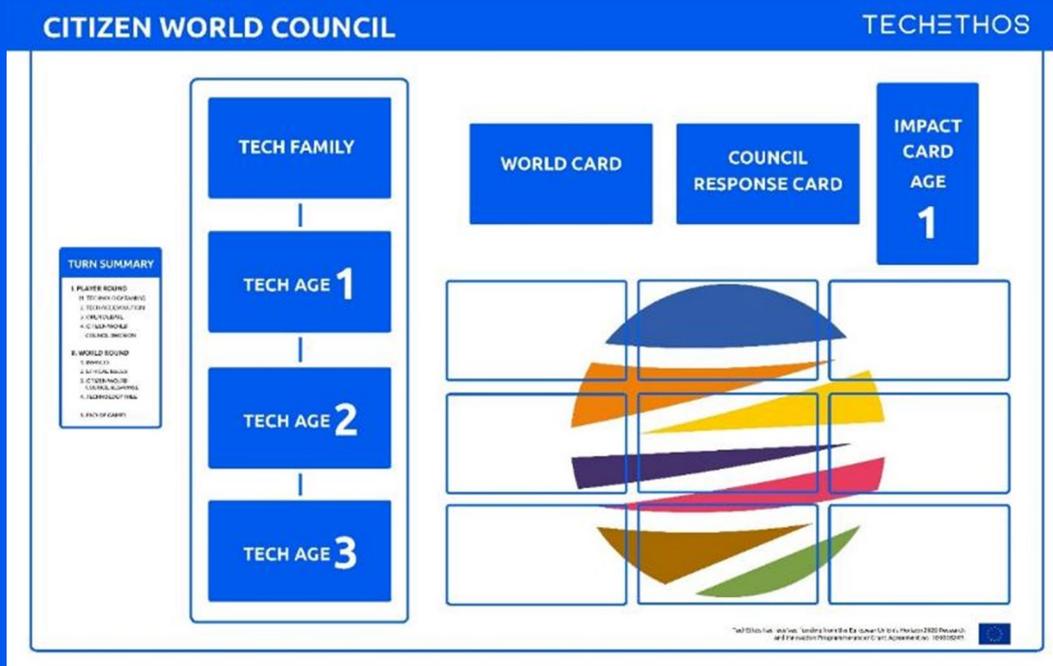


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No.101006249.

QUICK OVERVIEW

All games contain:

A *Citizen World Council board*



7 +1 Vote Cards



1 Turn Card



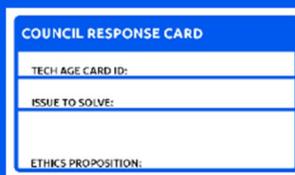
7 +2 Vote Cards



1 Credits Card



10 Council Response Cards



Solution Sheets (optional)

In the form of a notepad or loose sheets

3 Impact Tokens



1 Rulebook



QUICK OVERVIEW

So far, this game can be played with four distinct deck of cards corresponding to broad families of technologies: Neurotechnologies, Extended Reality, Natural Language Processing, and Climate Engineering Technologies.

Each **Technology Family** deck of cards contains:

1 **Tech Family Card**

This card provides a short description of the broad Technology Family.



3 **World Cards**

This card describes the **Social Factors** that will be impacted by the introduction at a large scale of specific technologies and innovations. It tracks the evolution of those factors as you play the game.



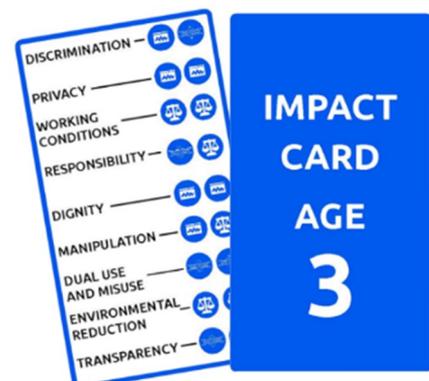
21 Tech Age Cards: 3 **Tech Age-1 Cards**, 9 **Tech Age-2 Cards** and 9 **Tech Age-3 Cards**

These cards are the essence of the game. They describe some of the technologies that form part of the technology family (Age 1), their possible application domains (Age 2), and the societal and ethical impacts that they might raise (Age 3).



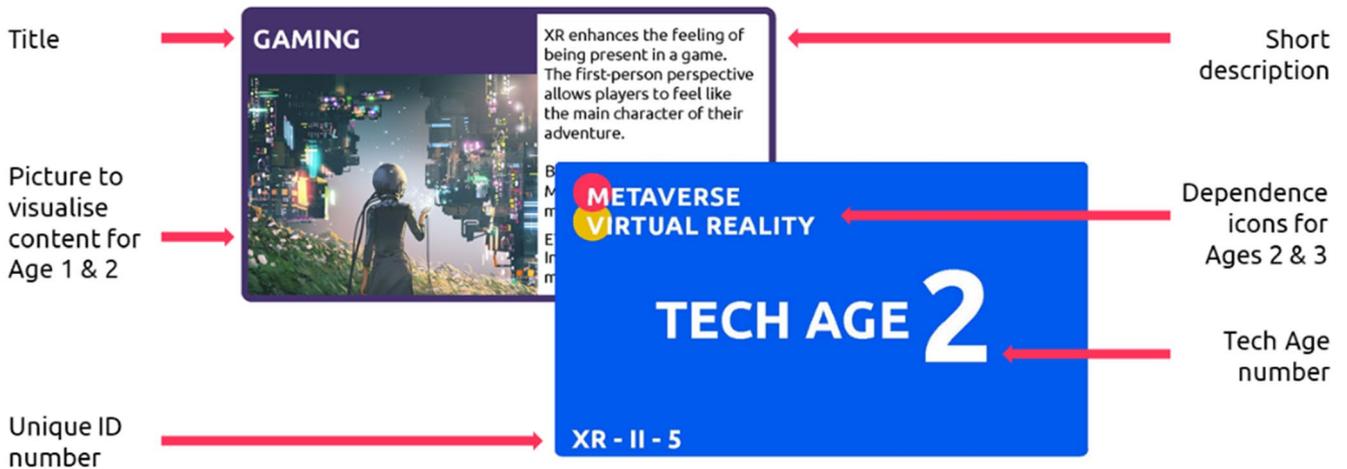
3 **Impact Cards**

There is one impact card per age. All **Tech Cards** from the associated age are listed on the corresponding **Impact Cards**. Next to the name of the **Tech Card** is a combination of **Social Impacts**. They are used to move tokens on the World Card between each Age.

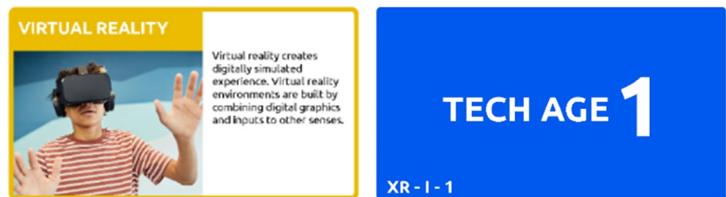


QUICK OVERVIEW

Anatomy of a *Tech Age Card*:



Tech Age-1 Cards (3) depict a specific technology associated with the overall Technology Family.



Tech Age-2 Cards (9) depict the possible applications domains of Tech Age-1 Cards in everyday life. They are linked to one or two cards belonging to the previous age, illustrated by the Dependence Icon on the back of these cards.



The **Gaming** card is dependent on **Metaverse** and **Virtual Reality**.

Tech Age-3 Cards (9) are ethical questions raised by a specific Tech Age-2 Cards. Players will have to pick the most important one to discuss boundaries and ethical issues.



The **Manipulation** card is dependent on **Gaming**.



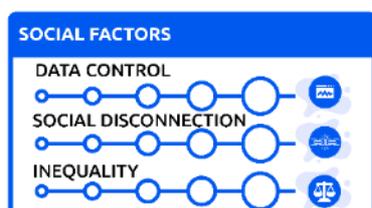
Setting up the game

- Place the **Gameboard** in front of you on the table.
- Give each player two **Vote Cards** (one **+1 Card** and one **+2 Card**).
- Choose the right **Card Deck**. Every game is about a specific **Technology Family** which has to be decided before the game starts. If your game has a moderator, they might have chosen your deck already.
- Choose your level of difficulty (**Easy, Normal** or **Expert**), pick the according **World Card** and place it face up on the gameboard. Put the other two World Cards back in the box. If your game has a moderator, they might have already chosen the difficulty level for your game.

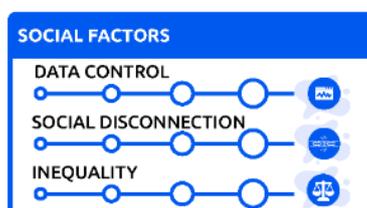
Choosing your World Card

The scales featured on a **World Card** represent the number of impacts the world can endure without falling apart. If any of them reach their maximum during the game, the game is over.

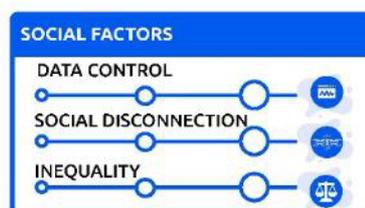
- If you want to focus the debate exploring the problems that can emerge with future technologies, you should pick a long scale (e.g., **Easy**) to leave more room for discussions.
- If you like to discuss possible solutions for the problems, pick a smaller scale (e.g., **Hard**) to fill out more of the **Council Response Cards**.



Easy



Normal



Hard

- Put 3 **Impact Tokens** at the beginning (0) of each scale of the chosen **World Card**. **Impact Tokens** will help you keep track of the impact your choices have on the scales of social factors present on your chosen World Card.
- Place the **Tech Family Card** face down in the middle.
- Place all **Tech Age Cards** in 3 different deck (3 Tech Age-1 Cards, 9 Tech Age-2 Cards and 9 Tech Age-3 Cards), face down, in their designated space on the board.
- Place the 3 **Impact Cards**, face down, in their designated space on the board.



Playing a round

Follow these steps, in order:

Player Round

(only for the first round) Technology Family

The **Technology Family Card** is flipped and read out loud

Tech Age Evolution

Pick the **Tech Cards** corresponding to the current age and place them all faced up around the **Technology Family Card** in the middle. They will unveil the evolutions taking place in the World.

Take turns to pick up, read out loud and place cards back on the table.

Open debate

As members of the Citizen World Council, you and your fellow players must decide which **Tech Cards** you value the most to bring forward into a future world. Take turns to express your points of view and pros and cons for specific cards.

Guiding questions for the open debate & vote

In **Age-1**, you must decide which technology should be developed in your ideal future. You might decide to explain to your fellow players, for example, why the Metaverse would be beneficial in the future and why Digital Twins would be better not to be developed further. **Vote for the technology which should be developed further.**

In **Age-2**, you must decide in which areas of life you would like the technologies selected in Age 1 to be applied. **Vote for the application areas you would like to see become a reality.**

In **Age-3**, you are called to reflect on the principles and values that may be impacted by your previous choices. You must decide which ethical issues are the most important for your group to tackle, in relation to the technologies you have selected and the areas of life in which they have been applied. **Vote for the most crucial societal and ethical issues that need to be addressed so to preserve the values you believe in most.**

Citizen World Council Vote

After the debate, it's time for the council to vote in secret for the **Tech Cards** they want to keep in the game. The **Tech Card** that has scored the least will be discarded.



In each age, one **Tech Card** should be removed and no more.

Place one or both of your **Vote Cards (+1 Vote Card and/or +2 Vote Card)** face down next to any **Tech Cards** of the current **Age**. If you wish, you can use both of your **Vote Cards** for the same **Tech Card**, to increase its chances of being kept in the game.



When all players have voted, flip over all **Vote Cards** and count the number of votes for each **Tech Card**. In case of a tie, take back your **Vote Cards**, discuss and vote again on the cards in the tie.

World Round

Impacts

After you decided which cards will stay, flip over the **Impact Card** corresponding to your Age. On this card, you find the impact scores of all **Tech Cards** remaining on the table.

Move the **Impact Tokens** on the **World Card** according to the scores on the **Social Factor** modifiers written next to each **Tech Card** remaining on the board in the current **Age**.

Counting Impact

In Age 2, you decide that the card **Health** will stay. This has a +1 impact on **Social Disconnection** and a +1 impact on **Data Control** you move the relevant tokens one step to the right on the **World Card**.

World status

Check the status of the **World Card**. If any **Impact Token** has reached the end of the scale, the world is in peril. Players can now take a decision regulating the technology, area of people's lives where it is making a change or ethical issue that has caused the world to break.

Citizen World Council Response

To do this, select a **Tech Card** whose effects you would like to cancel and think about who might be impacted negatively by the situation described on the **Tech Card** and how you, as a Citizen World Council, would solve the problem. After each player has thought about their solution individually, the results are discussed as a group.

Discuss to find a common response to the problem at hand. If the solution seems plausible for everyone at the table, and if at least half of the players agree, write down the solution on a **Council Response Card**.

Filling out a Council Response Card

COUNCIL RESPONSE CARD	
TECH AGE CARD ID:	
ISSUE TO SOLVE:	
ETHICS PROPOSITION:	



As a group, you should write directly on this card:

- The reference of the card whose effect you want to cancel; you find the **Tech Card ID** on the back of the **Tech Card**
- The most pressing issue that needs to be solved; and
- The solution proposed and agreed

Put the **Council Response Card** next to the **Tech Card** it addresses. As you have solved the problem, undo all the impacts of the **Social Modifiers** connected to this card, by moving the **Impact Tokens** backwards. Proceed to another one if needed.

Congratulations! You found a solution and the world survives for another age. If no satisfying solution has been found between players, the game is over.

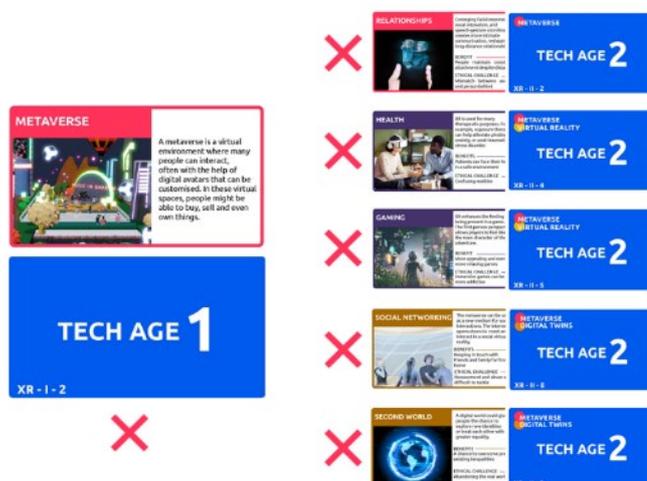
Moving on to the next Tech Age

Pick up the deck corresponding to the next Tech Age. Look at the back of all new cards.

Remove any **Tech Cards** in that deck that have **Dependence Icon** of the cards you eliminated in the Age before.

Discarding cards based on the dependencies

In **Tech Age-1** you removed **Metaverse**. Before you enter **Tech Age-2** you have to discard **Gaming**, **Social Networking** and **Second World** from the **Tech Age-2** deck, as they have the **Dependence Icon Metaverse** on the back of the cards.



Proceed to play the Player Round.

If you have reached the end of **Tech Age-3**, move on to the next section, 'End of the Game'.

End of the game

At the end of each **Age**, the remaining **Technology Cards** still on the board for the current **Age** change the World and modify at least one of the 3 **Social Factors**. Players have to prevent the World from collapsing during each of the 3 **Ages**.

If at any time any of the **Social Factors** reach their **Breaking Point**, players will have to agree on a common solution to the problem at hand, using **Council Response Cards**. If a joint solution is not found by players, the game is over.

At the end of **Age 3**, all players win if the world has not collapsed. Unfortunately, this may not be a World you'd like to live in. But take heart: the discussion afterwards will offer you an opportunity to reflect on alternative pathways!

You can now proceed to the next step of the workshop or play a new game with the same **Technology Family** deck or a different one.



About the game

TechEthos project

This game was developed in the framework of the EU-funded project TechEthos. TechEthos aims to bring ethical and societal values into the design and development of new and emerging technologies from the very beginning of the process.

We are focusing more specifically on three technology families: Neurotechnologies, Climate Engineering and Digital Extended Reality. The game allows you to discover each of them, thanks to the analysis carried out by the project, and to share your ideas with fellow players (and our project partners) about the kind of future world you'd want to be living in.

Ethics should be an intuitive part of technological research and innovation; TechEthos is committed to deliver guidelines that work for actors in the field. Your feedback in the game will fuel the project's work in this respect.

Game developers

The game concept was developed by the TechEthos Work Package 3 team: Greta Alliaj, Fabrice Juvenot, Cristina Paca and Andrew Whittington-Davis (Ecsite), Michael Bernstein, Wenzel Mehnert, and Masafumi Nishi (AIT, Austrian Institute of Technology), Steven Umbrello and Pieter Vermaas (TU Delft).

Contributions and feedback were received from the TU Delft GameLab (Simon Tiemersma) and science engagement experts participating in the co-creation workshops, either as the project Linked Third Parties or as invited experts.

The game card content is based on several internal reports and the following published report:

Adomaitis, L., Grinbaum A., Lenzi, D. (June 2022) *TechEthos D2.2: Identification and specification of potential ethical issues and impacts and analysis of ethical issues of digital extended reality, neurotechnologies, and climate engineering.*

Credits

Rulebook

Icons: Time Icon (p.1) by Muhazdinata on IconScout; Person icon (p.1) by Fiki Ahmadi on IconScout; [Attention Icon](#) by [Loritas Aventura](#) on [IconScout](#)

Gameboard

Icons: Adobe Stock 481674788.

Extended Reality Card Deck

Icons: Data Icon by Jemis Mali on IconScout; Splash visual by Irdat Purwadi on IconScout; Weak chain Icon in Glyph Style by WEBTECHOPS LLP on IconScout. Balance Icon by Grafix Point on IconScout.

Photographs: Vanessa Loring from Pexels. Adobe Stock 509802541; 262995960; 509419439; Adobe Stock 255418686; CultLab3D: Automated Scanning Technology for 3D Digitalisation; Winner of a EU Prize for Cultural Heritage / Europa Nostra Award 2018; Adobe Stock 500884386; Adobe Stock 504247272; Adobe Stock 254487269; Adobe Stock 260655912; Adobe Stock 490283930; Adobe Stock 409819147.

Natural Language Processing Card Deck

Icons: [Text search Icon](#) by [ch.designer](#) on [IconScout](#); [Group Icon](#) by [Zky Icon](#);

Photographs: Adobe Stock 482132921; Adobe Stock 526710714; Adobe Stock 383936306; Adobe Stock 509530604; Adobe Stock 293059971; Adobe Stock 393652002; Adobe Stock 378740721

Other notes: Images for cards 'People replicas', 'Artistic works' and 'Healthcare' were produced with AI involvement, using the website DALL-E from the OpenAI Lab. The image on the card 'Virtual Influencers' comes from the Instagram profile of virtual influencer @lilmiquela, <https://www.instagram.com/lilmiquela/>. The image featured on the card 'Text analysis and generation' comes from InfraNodus, <https://infranodus.com/>

Neurotechnologies Card Deck

Icons: Adobe Stock 262680943.

Photographs: Adobe Stock 270916294; Adobe Stock 170691466; Adobe Stock 194165520; Adobe Stock 444414682; Adobe Stock 220269394; Adobe Stock 314028559; Adobe Stock 372231498; Adobe Stock 217094326; Adobe Stock 308702722.

Other notes: The image for the card 'Medicine' comes from [Zephyr/Science Photo Library](#). The image used for the card 'Marketing' comes from [Unravel Neuromarketing Research](#). The image used for the card 'Education' comes from the [Centre for Neurotechnology](#), University of Washington, US.



Climate Engineering Card Deck

Icons: Adobe Stock 261029200; Flaticon: Democracy icons created by Parzival' 1997.

Photographs: Pixabay on Pexels; Adobe Stock 141268229; Adobe Stock 289079499; Adobe Stock 520098706; Adobe Stock 156095781; Adobe Stock 162644853.

Other notes: Two images come from Climeworks: on the card "Engineered CDR", as featured in dezeen magazine, and on the card "Direct Air Carbon Capture and Storage". The image featured on the card "Ocean Fertilisation" comes from [ESA, Envisat/MERIS](#). The image featured on the card "Marine Cloud Brightening" comes from the [Great Barrier Reef Foundation](#). The image featured on the card "Ground-based Albedo Modification" is coming from the [Million Cool Roofs Challenge/PEER Africa](#).



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