Rathenau Instituut

Immersive technologies though the lens of public values

Dr. Mariëtte van Huijstee

6 March 2024, CWI, Amsterdam

Rathenau Instituut

What is the impact of technology on our lives? In 1986 the government founded the Rathenau Instituut with the specific task to research these kind of questions.

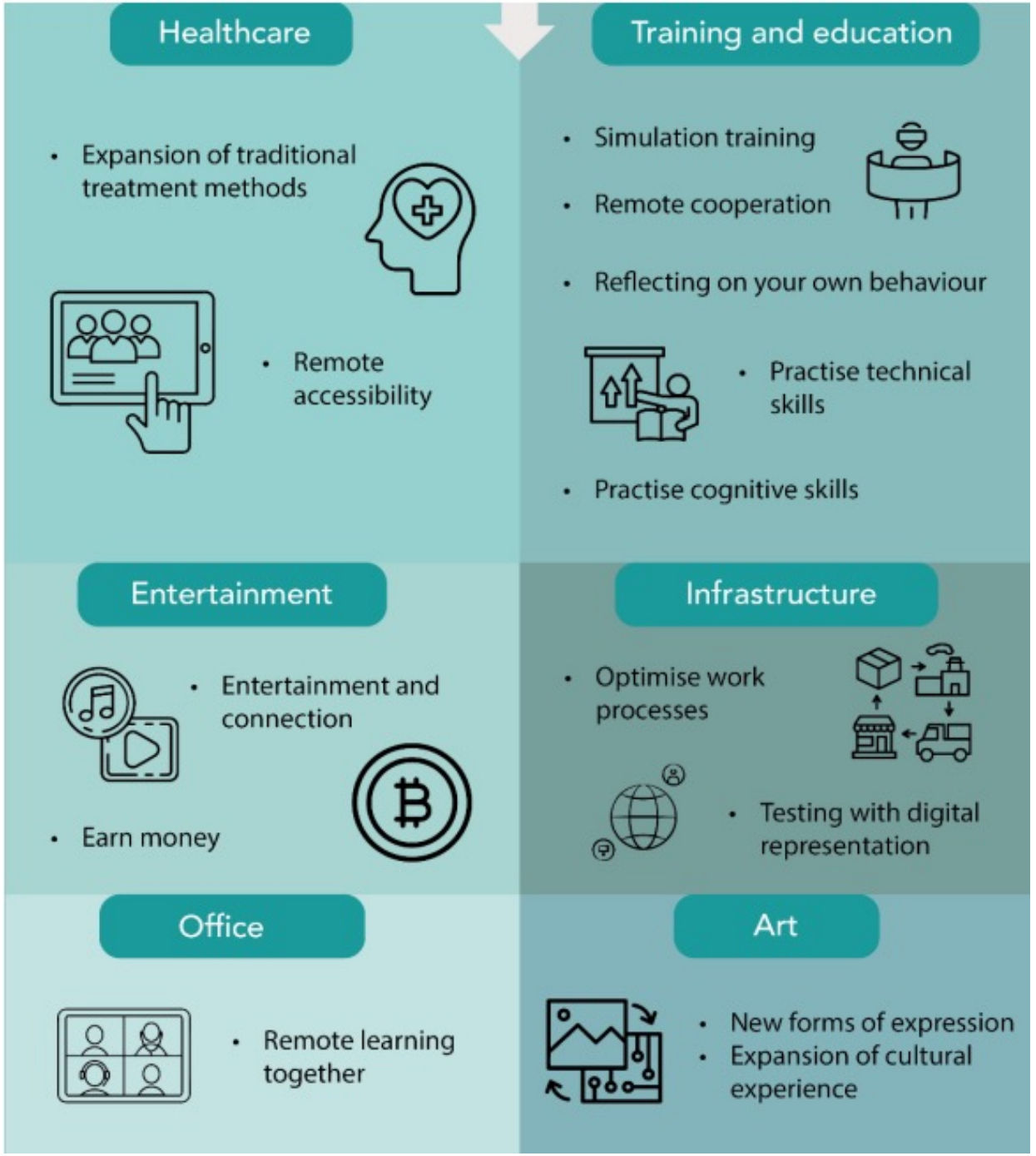
We have been involved in research and debate about the impact of science, innovation, and technology on society for 35 years.

We provide knowledge on the impact of upcoming technology, advise Parliament and government on this impact, and stimulate public debate between stakeholders, citizens and civil society.

Agenda

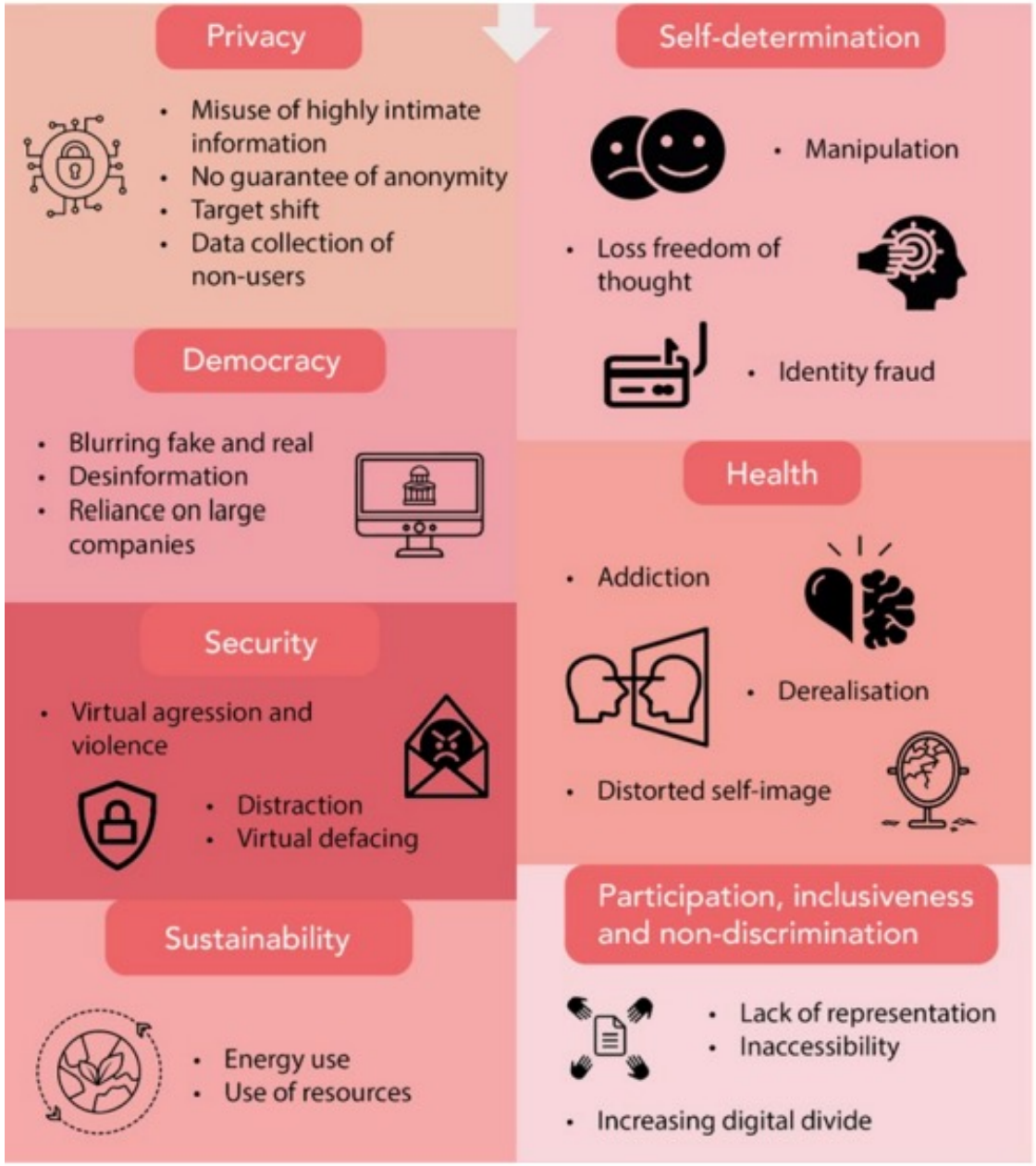
1. Specific applications of immersive technologies
2. Exercise
3. Societal risks of immersive technologies
4. Cybernetic feedback loop
5. Options for policy action
6. Closing

Specific applications of immersive tech

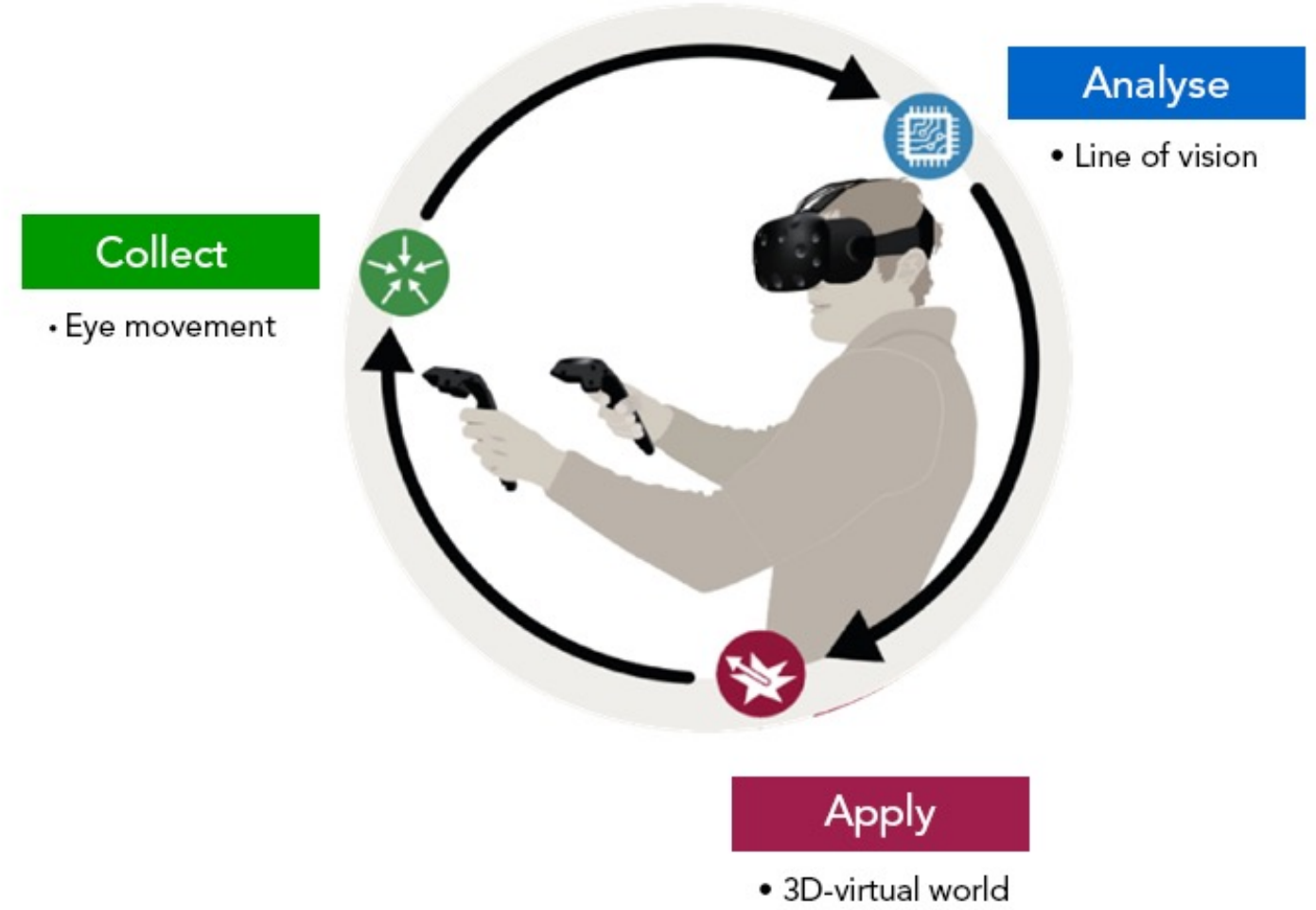


Exercise

Societal risks of immersive tech



Cybernetic feedbackloop



Possible analysis and application of physical and behavioural data collected through XR devices

Collect	Analyse	Apply
• Eye movements • Images of the user's environment • Location data • Neuro data • Body scan • Facial movements (facial expressions and emotions) • Pupil size • Hand movements • Head movements • Body movements • Brain activity • Voice and speech data • Heartbeat • Scans of the iris • Muscle reaction • Transparency • Body scan	• Viewing direction • Body posture • User position in relation to surroundings • Geographical location • Gender • Age category • User identity • Objects in the environment • Emotional response • Emotional state of mind • Cognitive state • Stress • Anxiety • Attention • Focus • Facial expression • Ethnicity • Sexual preference • Medical conditions (such as ADHD and autism) • Gait profile	• Generation of 3D (interactive) virtual environments, people or objects (incl. filters) • Stimulation of senses • Erasing elements from the physical world • Personalised advertising • Targeted content recommendation • Predicting thoughts and behaviour

Immersive technologies in society

Specific applications

Healthcare

- Expansion of traditional treatment methods
- Remote accessibility

Training and education

- Simulation training
- Remote learning together
- Reflecting on your own behaviour
- Practise technical skills
- Practise cognitive skills

Entertainment

- Entertainment and connection
- Earn money

Infrastructure

- Optimise work processes
- Testing with digital representation

Office

- Remote cooperation

Art

- New forms of expression
- Expansion of cultural experience

Societal risks

Privacy

- Misuse of highly intimate information
- No guarantee of anonymity
- Target shift
- Data collection of non-users

Democracy

- Blurring fake and real
- Disinformation
- Reliance on large companies

Security

- Virtual agression and violence
- Distraction
- Virtual defacing

Sustainability

- Energy use
- Use of resources

Self-determination

- Manipulation
- Loss freedom of thought
- Identity fraud

Health

- Addiction
- Derealisation
- Distorted self-image

Participation, inclusiveness and non-discrimination

- Lack of representation
- Inaccessibility
- Increasing digital divide

Options for policy action

Laws and regulations

- Strengthen the knowledge position of XR users
- Strengthen the privacy of XR users
- Protect the rights of non-users of XR
- Define the responsibilities of XR providers
- Commit to secure XR environments

Building of expertise and capacity

- Strengthen the capacity of supervisors
- Explore the need for greater protection of freedom of thought
- Organise public debate on the long-term impact of immersive technologies on people and society
- Promote research into the (long-term) effects of XR use

Incentive measures

- Stimulate public values by design
- Stimulate European and non-profit alternatives for XR-hardware and applications

Scan the QR code above for the Rathenau publication on Immersive Technologies

m.vanhuijstee@rathenau.nl