ethix

Innovation Brief #06

Extended Reality

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Take advantage of opportunities with ethix

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Tackling phobias by letting a virtual spider crawl over our skin.

Intelligent contact lenses that provide us information about our surroundings.

Imaginary friends with whom we can communicate through technology.

Last decade's science-fiction visions reflect our reality more than ever with Extended Reality.

The issue

Extended Reality applications are tools that combine reality with virtual elements. There are three broad categories: Augmented, Mixed, and Virtual Reality.

Augmented Reality
Augmented reality describes technology that extends our experience by projecting digital content into the physical world. The Pokémon GO app is the best-known example for augmented reality technology. In order to experience augmented reality, users interact with a digital device. For Pokémon GO, a smartphone or tablet is used. However, Google Glass is also an augmented reality device.
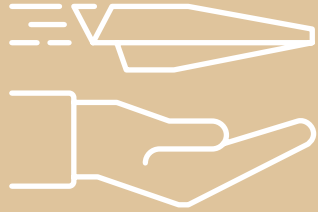
Mixed Reality
Mixed Reality not only enriches reality with projected content, but also makes it possible to interact with these projections, almost as one would interact with physical objects. This means that the technology recognizes gestures - such as hand movements - that allow a projected hologram to be manipulated. Microsoft, for example, is trying to advance this technology with the HoloLens.

Virtual Reality
Virtual reality describes real-time, computer-generated simulations that give the user the illusion of being in another reality. This type of simulation enables a particularly high degree of immersion, since the virtual can truly be perceived as reality. The most important devices used are virtual reality glasses or goggles, which can be supplemented by other sensory stimulation.

While in the past the virtual and reality were seen as two opposites, new technologies allow a spectrum of differentiation. Thus, the relationship between the virtual and reality is better represented on a continuum than as polar opposites. Blurring the lines between virtual content and reality brings opportunities, but also risks.

	Augmented Reality	Mixed Reality	Virtual Reality	
Realität	○	○	○	Virtualität

Affected Industries

Augmented Reality
Tourism
Safety

Mixed Reality
Industry
Medicine
Education
Military

Virtual Reality
Games
Pornography
Aviation
Psychology

Future scenarios

Discreetly identify people in a matter of seconds - with augmented reality facial recognition
Military units implement augmented reality devices disguised as fashionable eyewear to identify and locate "dangerous enemies." Now, civilian security personnel are also beginning to use this technology in public spaces to document people's misconduct unnoticed.

Fulfilling children's dreams - but in a different dimension
Lisa's parents fulfill their daughter's wish to have her own dog by giving her mixed reality glasses. These project a dog into Lisa's perceived reality. The conscious manipulation of Lisa's perception has a pleasant side effect: the strenuous and tedious care for the dog is no longer necessary.

Sexual relations in virtual reality - consent not required
Leonard fulfills his sexual fantasies with a virtual reality avatar. What requires consent in the real world, does not have such a stipulation in virtual reality. Even if he violates social norms or perpetrates sexist and illegal actions, there are no repercussions.

Ethical risk zones

Augmented Reality und Mixed Reality

• Ownership rights in public and
  private spaces

It is forbidden by law to attach advertising boards to someone else's house or to spray graffiti on public monuments. But do these ruels also apply in augmented reality? Who should have the right to design the extended private and public spaces?[1]

• Privacy and personal
  protection

On the one hand, augmented reality makes it possible to discreetly recognize and observe people and to retrieve information about them without their consent. On the other hand, the users also have to constantly disclose their location in order for most applications to function at all. Does augmented reality thereby create transparent people? And how high is the risk that malware infects AR systems and thus puts users in danger?[2]

Virtual Reality

• Loss of reality and dependency

When virtual realities appear so real that the users completely lose themselves in them, we speak of immersion or dissociation. What happens when users start to like virtual reality better than reality?

What if personal abilities are overestimated because one is more talented in virtual reality than in reality?[3]

• Solidarity

Solidarity is a fundamental social value based on a sense of community. Virtual Reality, however, can allow every user to create his or her own reality. Will this have a negative impact on community building in society and thus the moral obligations we have towards others? How may this be exacerbated if undesirable circumstances can be banned from one's own reality?

• Safety

Accident risks may increase when all of a user's senses are occupied in virtual reality. In addition to the physical danger, extreme realistic representations may cause psychological strain. Whose responsibility is it to warn and protect users from these dangers? ?[4,5]

[1] Erica L. Neely
Augmented Reality, Augmented Ethics: Who Has the Right to Augment a Particular Physical Space?

[2] Franziska Roesner
Who Is Thinking About Security and Privacy for Augmented Reality?

[3] Marius Schober
Will VR and AR make us feel lonely and isolated?

[4] Sandee LaMotte
The very real health dangers of virtual reality

[5] Mara Faccio and John J. McConnell
Death by Pokémon GO

Focus

Extended Reality applications allow their users to display behaviors that are ethically undesirable in the real world without subjecting them to social and legal control mechanisms. Yet, this also happens in movies, online games or chat forums. Are there reasons why the line between the ethically acceptable and unacceptable should be drawn differently for extended reality applications than for other forms of entertainment?

People interact differently with diverse mediums of entertainment. Depending on the medium, the line between what is desirable and undesirable varies. For example, a car chase in an action film may be perceived as stimulating, whereas the same content in Virtual Reality causes acute psychological stress. This difference arises because extended reality impacts several senses at once and is therefore perceived as more realistic by users. This high degree of immersion leads to reflexive psychological and physical experiences that make our body believe that extended reality — particularly virtual reality — is real. Therefore, it should be assumed that ethical boundaries of what is justifiable should be drawn differently for extended reality than for other media. In order to avoid such dangers, the content of simulations is central: Is what is presented justifiable from an ethical perspective?

This is the aim of submitting simulations to innovation-ethical analyses. How should a simulation be structured so that nobody is harmed by it? On the one hand, a simulation should not negatively influence the users. On the other hand, the simulation should also not cause indirectly harm. If, for example, a simulation shows racist content, this has a negative effect on behavior towards the discriminated group in reality. Such impacts need to be closely observed and addressed.

Looking forward

A technology that, through high degrees of immersion, pedals a new kind of reality which carries many ethical and even psychological risks: wouldn't it be better to do without it altogether? Or, are there fundamental values that could guide the development of extended reality in the future in order to avoid ethical pitfalls?

Extended reality can create considerable added value in many areas. Medical operations can be prepared and carried out more precisely, architectural offices can visualize their plans directly in reality, and teachers can use simulations for teaching purposes. Extended Reality opens up a socially innovative field that can be implemented profitably.

However, developments in extended reality require an ethical framework anchored in core values.

Privacy

Extended reality not only generates data, but also requires huge amounts of data to visualize the artificially generated reality. With this data generation and visualization, both the user and indirectly affected persons should have the protection of personal data and possible impacts of this data ensured.

Human dignity

The content of extended reality should neither be degrading for the user nor for indirectly affected persons. Discriminatory content should not be given room in extended reality applications.

Safety

At least two people have died in a Pokémon GO accident because they were distracted from traffic by the augmented reality app. Virtual reality glasses/goggles also pose a high safety risk, as they allow complete sensory isolation from reality. The safety of the user and his or her environment should be a top priority for extended reality applications.

In conclusion, ethical orientation for extended reality can also be provided by the "Equivalence Principle," formulated by Erick Jose Ramirez and Scott LaBarge of Santa Clara University:

> «If it would be wrong to allow subjects to have a certain experience in reality, when it would be wrong to allow subjects to have that experience in a virtually real setting.»
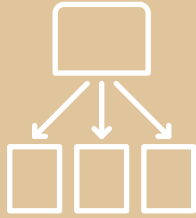
Resources

Thanks to the instruments developed by ethix and its partners, you can integrate the ethical challenges of human enhancement. You transform ethical risk areas into opportunities.

ethix Mapping and ethix Canvas
For the first assessment of questions of ethical risks and innovations in teh area of human enhancement.

ethix Workhop
For an in-depth examination of ethical opportunities and risks of human enhancement and possible implementation of checklists and other tools in the innovation process.

Internal training
Training and sensitization of employees involved in teh innovaiton process of human enhancement technologies.

ENGAGEMENT
EIN FÖRDERFONDS DER MIGROS-GRUPPE