

Rathenau Manifesto



Set 10 design requirements for tomorrow's digital society now

With the breakthrough of 'immersive' technologies such as augmented reality, virtual reality and voice computers, the digital society is entering a new phase. The physical and digital worlds are becoming more interlinked than ever before, and this raises urgent social and political questions. In this manifesto, the Rathenau Instituut sets out ten design requirements for tomorrow's digital society.

Over the past two years, the Rathenau Instituut has been researching Virtual Reality, Augmented Reality and speech technology. We call these technologies 'immersive technologies' because they immerse us deeper than ever into the digital world. Virtual Reality transports us into a completely artificial world, in which all sounds and images are created by computers. We can now train soldiers on a virtual battlefield. Augmented Reality adds digital layers to our experience. With smart glasses, a car mechanic sees useful information while looking at the engine. Through speech technology we can talk

to computers, and in more and more locations many devices, such as our smartphones and smart speakers, are listening in on us.

Our far-reaching immersion in digital technology raises urgent social and political questions. After all, immersive technology has three characteristics that can be used for the better, but certainly also for the worse:

1. **Biometric surveillance:** For the applications to work properly, cameras, smart speakers, VR glasses, and other hardware need to digitally record parts of our bodies and our environment. Our faces, eye movements, voices and behaviour need to be recognised and tracked. This means that immersive technology is constantly and closely monitoring us. But do we want our voices, our faces and even our emotions to be observed and collected by many companies, organisations and governments?
2. **Digital modification:** With the help of this data you can create and adapt the digital world. You can copy, distort or omit faces, voices or living environments. In this way, your voice can be cloned with a recording of only a few minutes. With face filters in Snapchat we change our appearance. And deep fake videos on social media spread a distorted image of reality. Even the world around us can be updated and adapted. For example, a programmer in San Francisco developed a tasteless AR app that filters homeless people out of the streetview. This, too, raises big questions. Is fake still distinguishable from real? Will our society be better if the physical world is digitally manipulated?
3. **Influencing through intuitive interaction:** Immersive technology offers new ways to control computers and interact with the digital world. Until now, we mainly used the keyboard, the mouse and a screen. Now, we can use our voices and movements. The operation of devices becomes more natural. With VR glasses we immerse ourselves in virtual worlds and with AR glasses we can see and touch virtual monsters or works of art in the physical world. And so, often without us noticing, we are drawn deeper into the digital world and digital applications can influence us even more. Yes, we can easily talk to a speech assistant, but that speech assistant can also influence us, become our friend, and can even become addictive to us. At the end of the day, the voice assistant also serves the interests of the person who created the assistant. So to what extent do we want to immerse ourselves?

The emergence of immersive technology blurs the boundary between humans and computers, between physical and digital and between fake and real. As a result, various public values are at stake, including privacy, autonomy, honesty and health. That is why, on the basis of three research reports, the Rathenau Instituut presents ten design requirements for tomorrow's digital society. Ten demands requiring urgent action and dialogue from governments, businesses and citizens, so that immersive technology makes our world richer, not poorer.

Design Requirement 1. We want to remain in control of our digital body

Immersive technology constantly collects sensitive, intimate data, such as recordings of our voice, our gestures or our face. This poses numerous privacy risks: our voice and face can literally be stolen, and used to commit fraud or damage our reputation. In addition, we will feel more scrutinised than ever before, and we will adapt our behaviour accordingly. Do we still know who is watching or listening, and when? The protection of this intimate data is not yet in order. Public authorities must provide better legal protection for these data, particularly biometric data, so that citizens can have more control over their body and behavioural data.

Design Requirement 2. We want to be able to remain anonymous

The use of speech and AR technology can threaten a person's anonymity in both public and private spaces. The identity of accidental passers-by can be traced ever more accurately and at ever greater distance by analysing their face, walking behaviour or voice. In doing so, recordings are compared with databases filled with video and audio material that is often scraped off the internet. Some investigative services already make use of this. There are also publicly accessible apps with which you can identify others. If we are not careful, numerous applications will soon be available that will allow companies, governments and citizens to simply remove your anonymity. This is an unacceptable invasion of people's privacy and security. Applications that allow citizens to be identified remotely in the public domain should therefore be banned.

Design Requirement 3. We want control over our virtual identity

We express our identity through immersive technology. Just as we use garments or tattoos to distinguish ourselves in the physical domain, we can also do so in the virtual domain. Avatars represent us in VR and with AR we can change our appearance. With some applications we can even change the appearance of others. This can lead to very undesirable and humiliating social situations. Think, for example, of the DeepNude app, which removes clothing from images of women and makes them look realistically naked. It is therefore essential that the government makes it clear what you can and cannot do with the image of someone else – people deserve protection from unwanted digital interventions on their bodies.

Design Requirement 4. We want clarity on new digital property issues

Immersive technology also raises new questions about ownership – of our properties in both the virtual and physical world. Who owns the data that is on social media? And whose property are the profiles based on this data? Whose property is a voice recording, an image, or information about our gaze? Is our property violated when someone in AR paints a swear word on the wall of our house? The existing legal frameworks therefore need to be clarified and updated, with the principle that what applies offline also applies online.

Design Requirement 5. We want to live in an inclusive digital world

The challenge of making our digital society inclusive, not discriminating on the basis of gender or skin colour, and not encouraging stereotypes, has long been discussed. This

challenge applies particularly to the way in which immersive technology adapts our reality. For example, there is already criticism on VR games and pornography, which encourage stereotypes and invariably depict white men in the leading role. Think also of voice applications that understand female voices less well than male voices, or a virtual background that works worse when someone with a black skin colour comes into the picture. Companies and developers should put inclusion at the heart of the development and use of their applications.

Design Requirement 6. We want to be able to know that something is fake

Immersive technology can confuse users considerably. For example, children who had swum with orcas in VR later thought they had really done this. Speech assistants speak with lifelike voices – in the future, will you know that you have a robot on the line? Because immersive technology is producing increasingly powerful simulations, in the long run it becomes difficult for users to separate reality from fiction. With immersive technology, human experience can change so much that we no longer know whether we can trust our eyes and ears. Developers and companies must therefore agree that users will be informed in advance if something is fake and will not be fooled.

Design Requirement 7. We want protection against manipulation and persuasion

Through immersive technology, people can be influenced and manipulated. The intimate data that they collect provides companies with numerous insights into a person's personality, behaviour and preferences. Physical-virtual spaces also offer new opportunities for targeted advertising that can respond to a person's desires, preferences and choices at a direct and subconscious level. Companies, citizens and states try to steer citizens' perceptions in such a way that they accept certain thoughts or make certain choices. Think of the deep fakes with which users bombard each other on social media, and the conspiracy theories that circulate online and are supported by manipulated audio fragments. With immersive technology, propaganda takes on new forms – you can deliberately make other people believe in a different reality. That is why a society-wide commitment is needed, with contributions from independent journalism, investment in the media skills of citizens, and clear agreements on the extent to which influence can be exercised.

Design Requirement 8. We don't want our health to be harmed

Immersive technology can improve our health, but it can also damage it. It can teach people new skills, empower them, and speed up and reduce the cost of learning. But therapies with VR and AR are still in the early stages – there is still insufficient knowledge of the risks involved in using the technology, and of its long-term effects. VR and AR applications are, in extreme cases, known to lead to addiction. AR applications, in particular, also appear to pose risks with regard to physical safety. For example, players of the popular mobile game Pokémon GO have repeatedly caused (fatal) traffic accidents. More research is needed on negative effects, and companies need to do more to protect users from these effects.

Design Requirement 9. We want a digital market with a fair balance of power

Over the last 20 years, a small number of technology companies have become powerful commercial giants dominating the internet economy. This also applies to the market for AR, VR and voice technology. Think, for example, of the voice assistants Google Assistant and Amazon Alexa. They have great power in relation to consumers – as consumers, try holding Google or Facebook accountable. They also have power over newcomers to the market, which they often quickly buy up. And their market power ultimately translates into political power: the international giants can strongly influence national governments and, with their social media, play a key role in the political debate. That is why the government must counterbalance the power of the big technology companies more effectively. And companies must take more responsibility to protect the rights of consumers.

Design Requirement 10. We want public spaces to remain public

Immersive technology puts pressure on the communal character of the public space. Firstly, because people are given the opportunity to view public spaces through personal digital glasses – we have already written about an app that removes homeless people out of the streetview. This undermines social cohesion and reinforces the social fragmentation that can already be seen. Secondly, commercial AR developers can release so many virtual layers and applications into a public space that it is no longer a place for everyone. Think, for example, of a beach in Pokémon Go that was allocated so much Pokémon that it was flooded by Pokémon fans. There must be clear rules for digital expressions in public spaces so that the commonality is preserved. This calls for the development of a new social etiquette: how do we treat each other decently in this new world?

The implementation of these ten design requirements is badly needed in order to steer the course of the digital society. But it is only the beginning. That is why we end with an appeal to the citizen: make yourself heard, and speak up about what you need in tomorrow's digital world. We must not abandon our digital destiny. As democratic citizens, we must determine our digital future for ourselves.

Would you like to know more? On 24 October, the Rathenau Instituut will host a talk show about immersive technology during Dutch Design Week. On 26 November, Rathenau Live will take place, and together we will discover online how immersive technology is changing us and our world. More information about the research reports can be found at <https://www.rathenau.nl/en>