



Risk assessment for new technology products: case study of domestic VR tools

VR is Virtual Reality (VR) is represented by the use of computer technology to create a simulated environment. Domestic VR systems involve wearing a headset, sometimes in conjunction with handsets or controllers.

The **VR technology importance is bound to the growth of the industry** (within the past several years, VR technology grew at a rapid speed and occupied diverse industries introducing different ways of media marketing), and is an interesting case study to assess the safety of new technology products. The risks linked to new technology products are covered by the Commission's proposal on the General Product Safety Regulation.

VR could be an interesting example of assessing the risks of new technology products for the following reasons:

Identified risks and effects:

1. **General risks linked to VR use (during and right after): physical injury** (risk of falling or hitting objects in the real world), **cybersickness** (nausea, eyestrain, headaches, disorientation), **adaptation** (changes to the body can occur from frequent use of VR, including changes to the visual system and postural instability), **engaging in activities following VR use** – if an individual is suffering from any of the above effects, this presents a further risk if an individual engages in another activity immediately following VR use. VR use can change the user's **physiological state** slightly, with heart rate, skin temperature, perspiration and electro-dermal activity affected (including triggered epileptic seizures).
2. **Cybersickness** considers both the physiological effects that may affect the wellness of users during use, and how the short-term effects might impair their safety in activities immediately after VR use. Cybersickness essentially is a form of motion sickness induced through immersion in VR. The most widely accepted theory for cybersickness is the **sensory conflict theory**, which suggests that there is a mismatch between visual and vestibular (this is the system for balance and spatial awareness) sensory inputs which stimulates feelings of nausea and disorientation. Forms of simulated movement which lack motion signals (such as teleporting from various positions within a virtual environment) are less likely to provoke cybersickness, but can increase **feelings of disorientation**.
3. **Other short-term effects** following VR use consist of: eye soreness and trouble focusing, impaired hand-eye coordination, reduced depth perception / sensory problems, difficulties in readjusting motor responses to real-world space, decreased reaction time, loss of balance / prolonged nausea.
4. **Other long term-effects** potentially resulting from VR use: skin irritations, increase in myopia and early blindness, partial (one eye) or total, permanent or temporary loss of sight, effects on balance and coordination, reaction times and physiological responses.

Looking more in depth to the market surveillance of new technology products, via the case study of VR tools, could contribute to a more modern market surveillance by engaging in reflection strands at national levels but also by identifying quick wins such as via awareness raising or exchange of best practices activities, possibly by further supporting MSs in coordinated activities.

Suggested next steps: share experience and best practices between MSAs, and develop common accident scenarios and risk assessment methodologies for these products, potentially common sampling and testing e.g. in the context of a next CASP activity.

We warmly invite you to take the floor during the next meeting on this important topic. For further clarifications, please feel free to contact **András Zsigmond**: Andras.ZSIGMOND@ec.europa.eu